

HORTICULTURAL REPORT

2018 WEED CONTROL RESEARCH ON FRUIT & VEGETABLE CROPS

NUMBER 82

NOVEMBER 2018

By

Bernard H. Zandstra
Nicole M. Soldan
Monique K. Hemker
William R. Chase
Colin J. Phillippo
Taylor G. Miller

Department of Horticulture
Michigan State University
East Lansing, Michigan

**WEED CONTROL IN HORTICULTURAL CROPS - 2018
FOREWORD**

This report summarizes the results of weed control experiments on horticultural crops in Michigan in 2018. It is intended to inform industry and university research and extension colleagues of our current results.

This project was supported by the USDA National Institute of Food and Agriculture (NIFA) Hatch project number MICL01325, and by MSU Extension.

We appreciate the support for our weed control research and extension program from the following companies and organizations that provided financial support, chemicals, equipment, seeds, plants, research sites, or other support for our program:

ADAMA	MICHIGAN ONION RESEARCH COMMITTEE
ALBAUGH LLC	MICHIGAN PICKLE AND PEPPER RESEARCH COMMITTEE
AMVAC CHEMICAL CO.	MICHIGAN VEGETABLE COUNCIL, INC.
ARYSTA CHEMICAL CO.	MONSANTO CHEMICAL CO.
BASF CORP.	MSU EXTENSION
BAYER CROPSCIENCE	NATIONAL GRAPE COOPERATIVE
BEJO SEEDS	NEUDORFF
BELCHIM	NICHINO AMERICA INC.
CERTIS USA	NOURSE FARMS
CNOSSEN FARMS	NUFARM AMERICAS
CORTEVA	PICKLE PACKERS INTERNATIONAL
CROP PRODUCTION SERVICES	PROJECT GREEN OF MSU
FMC CORP.	RISPENS SEED CO.
GOWAN CHEMICAL CO.	SCHREUR FARMS, INC.
HARRIS MORAN SEED CO.	SEEDWAY INC.
HELENA CHEMICAL CO.	SEMINIS SEED CO.
HELM AGRO	SPRAYING SYSTEMS CO
IR-4 PROJECT OF USDA	STOKES SEED CO.
IRRER FARMS	SYNGENTA CROP PROTECTION, INC.
ISK BIOSCIENCES	SYNGENTA SEEDS
KEILEN FARMS	TESSENDERLO KERLEY INC.
KHRONE PLANT FARM	UNITED PHOSPHORUS INC.
KUMIAI CHEMICAL CO.	VALENT USA CORP.
MALBURG FARMS	VAN DRUNEN FARMS, INC.
MICHIGAN ASPARAGUS RESEARCH BOARD	VAN DYK FARMS, INC.
MICHIGAN CARROT RESEARCH COMMITTEE	VOGEL FARMS
MICHIGAN CELERY RESEARCH, INC.	WAHMHOFF FARMS
MICHIGAN CHRISTMAS TREE ASSOCIATION	WILLBUR ELLIS
MICHIGAN MINT RESEARCH COMMITTEE	WINFIELD SOLUTIONS
MICHIGAN MINT RESEARCH COMMITTEE	

For Additional Information, Contact the Following Researchers:

Bernard H. Zandstra, 1066 Bogue St., A440 Plant and Soil Science Building,
Michigan State University, East Lansing, Michigan 48824-1325. (517) 353-6637.
zandstra@msu.edu

Monique Hemker, 1066 Bogue St., A438 Plant and Soil Science Building,
Michigan State University, East Lansing, Michigan 48824-1325. (517) 353-0415.
hemkermo@msu.edu

TABLE OF CONTENTS

PAGE

FOREWORD.....1
TABLE OF CONTENTS.....2
METHODS.....4
WEED LIST.....5
CHEMICAL AND ADJUVANT LIST.....8
ABBREVIATIONS USED IN THE REPORT.....13

WEATHER DATA

Horticulture Teaching and Research Center (HTRC), East Lansing, MI.....14
Clarksville Research Center (CRC), Clarksville, MI.....16
Southwest MI Research and Extension Center (SWMREC), Benton Harbor, MI....18
City of Fremont, Fremont, MI.....20
Asparagus Research Farm, Hart, MI.....22
Michigan Celery Cooperative, Hudsonville, MI.....24
Lapeer USDA/NRCS Office, Imlay City, MI.....26
Stelle, Illinois Climate Network Station, Momence, IL.....28

WEED CONTROL RESULTS:

A. VEGETABLE CROPS

Asparagus

Weed Control in Asparagus - Hart.....31
Weed Control in Asparagus - HTRC.....34
Fall Weed Control in Asparagus - Malburg.....42

Basil

Weed Control in Basil - Van Drunen Farms.....45

Beets and Chard

Weed Control in Red Beet, Sugar Beet, and Swiss Chard - HTRC.....48

Broccoli and Cabbage

Weed Control in Broccoli and Cabbage - HTRC.....54

Corn

Weed Control in Sweet Corn - HTRC.....63

Cucumber

Weed Control in Pickling Cucumber - HTRC68

Garlic

Weed Control in Garlic with BIR - HTRC.....72

Leek

Performance of Prometryn on Transplanted Leek - IR4 - Schreur Farms.....75
Preemergence Weed Control in Green Onion and Leek - Schreur Farms.....102
Preemergence Weed Control in Seeded Green Onion and Leek - Van Drunen
Farms95
Postemergence Weed Control in Seeded Green Onion and Leek - Van Drunen
Farms98

<u>Lettuce</u>	
Weed Control in Lettuce - Imlay City.....	78
<u>Mint</u>	
Weed Control in Mint with Saflufenacil - Irrer.....	80
<u>Onion and Leek</u>	
Preemergence Weed Control in Onion - Muck Soil - Keilen Farms.....	82
Preemergence and Postemergence Weed Control in Onion - Muck Soil - Keilen Farms.....	87
Preemergence Weed Control in Onion - HTRC.....	92
Weed Control in Onion on Mineral Soil - Vogel Farms	94
Preemergence Weed Control in Seeded Green Onion and Leek - Van Drunen Farms	97
Postemergence Weed Control in Seeded Green Onion and Leek - Van Drunen Farms	100
Preemergence Weed Control in Green Onion and Leek - Schreur Farms.....	104
<u>Pepper</u>	
Weed Control in Bell Pepper and Tomato - HTRC.....	109
<u>Pumpkin and Squash</u>	
Weed Control in Pumpkin and Squash - HTRC.....	120
<u>Strawberry</u>	
Weed Control in a New Strawberry Planting - HTRC - 2018.....	125
<u>Tomato</u>	
Weed Control in Bell Pepper and Tomato - HTRC.....	109
B. <u>FRUIT CROPS</u>	
<u>Apple</u>	
Weed Control in Apple - CRC.....	127
Weed Control in Apple - HTRC.....	135
<u>Blueberry</u>	
Preemergence Weed Control in Blueberry - SWMREC.....	141
<u>Cherry</u>	
Postemergence Weed Control in Cherry - HTRC.....	146
<u>Grape</u>	
Postemergence Field Bindweed Control in Concord Grape - HTRC.....	152
<u>Hops</u>	
Preemergence Weed Control in Hops - SWMREC.....	155
Postemergence Weed Control in Hops - SWMREC.....	158
<u>Raspberry</u>	
Postemergence Weed Control with Glufosinate - HTRC - 2018.....	160
Weed Control in Raspberry - CRC.....	164

METHODS

Chemical Application

Herbicides were applied with a small plot sprayer using carbon dioxide as a source of pressure. Spray volumes are specified in each experiment. All herbicide rates are expressed as pounds of active ingredient per acre.

Visual Evaluations

In most instances, weed control ratings were made on individual weed species. General ratings for broad-leaved weeds and grasses were sometimes used in orchard studies or for late-season assessments.

Weed control and crop injury are rated on a 1 to 10 scale; 1 = no visible injury or reduction in growth; 10 = complete kill of plants. The ratings can be roughly translated into percentages as follows:

10 = 100% kill, all the plants are dead or none are visible.

9 = 90-100% kill or reduction in growth and stand.

8 = 80-90% kill or reduction in growth and stand.

7 = 70-80% kill or reduction in growth and stand.

This is still a commercially acceptable control.

6 = 60-70% kill or reduction in growth and stand.

5 = 50% kill or reduction in growth and stand.

4 = 30-40% kill or reduction in growth and stand.

3 = 20-30% reduction in growth and stand.

2 = 10-20% reduction in growth and stand.

1 = 0-10% reduction in growth, no obvious effect of herbicide.

Experimental Design and Statistical Analysis

Experiments were set up and analyzed in the program Agriculture Research Manager (ARM) version 9.2014.7, from Gylling Data Management, Inc. (RR 4 405 Martin Boulevard, Brookings, SD 57006). Unless otherwise specified, the experiments were laid out as randomized complete blocks. The data were subjected to analysis of variance and the means were compared with the LSD test at the 5% level. Since data transformations were not used, the coefficient of variation for skewed ratings or weed densities may be misleading. In some instances, yields for weeded check plots may be low because of severe early weed competition. In these cases, it may be more desirable to compare new herbicides with standard treatments.

WEED LIST

Abbreviations for the common names of weeds correspond to those presented in the NCWSS proceedings volume 28 (1973), 143.

<u>Abbr.</u>	<u>Common Name</u>	<u>Botanical Name</u>
ALFA	alfalfa	<i>Medicago sativa</i> L.
ANBG	annual bluegrass	<i>Poa annua</i> L.
ANFB	annual fleabane	<i>Erigeron annuus</i> (L.) Pers.
ATRI	Atriplex	<i>Atriplex patula</i> L. (Gray)
ASDF	aisatic dayflower	<i>Commenlina</i>
BABR	bald brome (upright brome)	<i>Bromus racemosus</i> L.
BEGR	Bermudagrass	<i>Cynodon dactylon</i> L. Pers.
BFTF	birdsfoot trefoil	<i>Lotus corniculatus</i> L.
BHPL	buckhorn plantain	<i>Plantago lanceolata</i> L.
BLCA	bladder campion	<i>Silene latifolia</i> Pior.
BLDO	broadleaf dock	<i>Rumex obtusifolius</i> L.
BLME	black medic	<i>Medicago lupulina</i> L.
BRFB	British fleabane	<i>Inula britannica</i> L.
BRPL	broadleaf plantain	<i>Plantago major</i> L.
BSPL	blackseed plantain	<i>Plantago rugelii</i> Dcne.
BYGR	barnyardgrass	<i>Echinochloa crus-galli</i> (L.) Beauv.
CABG	Canada bluegrass	<i>Poa compressa</i> L.
CABR	California brome	<i>Bromus carinatus</i> L.
CAGE	Carolina geranium	<i>Geranium carolinianam</i> L.
CATH	Canada thistle	<i>Cirsium arvense</i> (L.) Scop.
CAWE	carpetweed	<i>Mollugo verticillata</i> L.
CEPR	common evening primrose	<i>Oenothera biennis</i> L.
CLGC	clammy groundcherry	<i>Physalis heterophylla</i> Nees.
COBD	common burdock	<i>Arctium minus</i> (Hill) Bernh.
COBU	cocklebur	<i>Xanthium strumarium</i> L.
COCW	common chickweed	<i>Stellaria media</i> (L.) Cyrillo
COGR	common groundsel	<i>Senecio vulgaris</i> L.
COLQ	common lambsquarters	<i>Chenopodium album</i> L.
COMA	common mallow	<i>Malva neglecta</i> Wallr.
COMU	common mullein	<i>Verbascum Thapsus</i> L.
COMW	common milkweed	<i>Asclepias syriaca</i> L.
COPU	common purslane	<i>Portulaca oleracea</i> L.
COPW	common pokeweed	<i>Phytolacca americana</i> L.
CORW	common ragweed	<i>Ambrosia artemisiifolia</i> L.
CRWS	creeping woodsorrel	<i>Oxalis corniculata</i> L.
CUDO	curly dock	<i>Rumex crispus</i> L.
CWBS	catchweed bedstraw	<i>Galium aparine</i> L.
DAND	dandelion	<i>Taraxacum officinale</i> Weber
DOBG	downy brome	<i>Bromus tectorum</i> L.
EBNS	eastern black nightshade	<i>Solanum ptycanthum</i> Dun.
FAPA	fall panicum	<i>Panicum dichotomiflorum</i> Michx.
FIBW	field bindweed	<i>Convolvulus arvensis</i> L.
FIPA	field pansy	<i>Viola rafinesquii</i> Greene
FIPC	field pennycress	<i>Thlaspi arvense</i> L.
FISB	field sandbur	<i>Cenchrus incertus</i> M.A.Curtis
FIVI	field violet	<i>Viola arvensis</i> Murray
GALI	galinsoga	<i>Galinsoga quadriradiata</i> Ruiz & Pav.

WEED LIST

<u>Abbr.</u>	<u>Common Name</u>	<u>Botanical Name</u>
GIRW	giant ragweed	<i>Ambrosia trifida</i> L.
GAGR	goosegrass	<i>Eleusine indica</i> (L.) Gaertn.
GORO	goldenrod	<i>Solidago nemoralis</i> Ait.
GIFT	giant foxtail	<i>Setaria faberi</i> Hermm.
GRFT	green foxtail	<i>Setaria viridis</i> (L.) Beauv.
GFPW	greenflower pepperweed	<i>Lepidium densiflorum</i> Schmd.
HABC	hairy bittercress	<i>Cardamine hirsute</i> L.
HAFE	hard fescue	<i>Festuca brevipila</i> Tracey
HANS	hairy nightshade	<i>Solanum sarrachoides</i> Sendtner
HAVE	hairy vetch	<i>Vicia villosa</i> Roth
HEBW	hedge bindweed	<i>Calystegia sepium</i> (L.) R. Br.
HENB	henbit	<i>Lamium amplexicaule</i> L.
HEMU	hedge mustard	<i>Sisymbrium officinale</i> (L.) Scop.
HOAL	hoary alyssum	<i>Berteroa incana</i> (L.) DC.
HONE	horsenettle	<i>Solanum carolinense</i> L.
HOWE	horseweed (marestail)	<i>Conyza canadensis</i> (L.) Scop.
IRFB	Irish fleabane	<i>Inula salicina</i> L.
JABR	Japanese brome	<i>Bromus japonicas</i> L.
JIWE	jimsonweed	<i>Datura stramonium</i> L.
LACG	large crabgrass	<i>Digitaria sanguinalis</i> (L.) Scop
LATH	ladysthumb	<i>Polygonum persicaria</i> L.
MAYC	marsh yellowcress	<i>Rorippa islandica</i> (Oeder) Barbs
MECW	mouseear chickweed	<i>Cerastium vulgatum</i> L.
MECR	mouseear cress	<i>Arabidopsis thaliana</i> (L.) Heynh
MONO	monolepis	<i>Monolepis nuttaliane</i> Greene
MUTH	musk thistle	<i>Carduus nutans</i> L.
MWCH	mayweed chamomile	<i>Anthemis cotula</i> L.
NIMB	nimblewill	<i>Muhlenbergia schreberi</i> J.F. Gmel.
NLLQ	narrowleaf lambsquarters	<i>Chenopodium desiccatum</i> A. Nels
OEDA	oxeye daisy	<i>Chrysanthemum leucanthemum</i> L.
ORGR	orchardgrass	<i>Dactylis glomerata</i> L.
PAWE	pineappleweed	<i>Matricaria matricariodes</i> (Less) C.L. Porter
PEST	perennial sowthistle	<i>Sonchus arvensis</i> L.
PESW	Pennsylvania smartweed	<i>Polygonum pennsylvanicum</i> L.
PERG	perennial ryegrass	<i>Lolium perenne</i> L.
POAM	Powell amaranth	<i>Amaranthus powellii</i> S. Wats
POIV	poison ivy	<i>Rhus radicans</i> L.
PRKW	prostrate knotweed	<i>Polygonum aviculare</i> L.
PRLE	prickly lettuce	<i>Lactuca serriola</i> L.
PRPW	prostrate pigweed	<i>Amaranthus blitoides</i> S. Wats.
PUDN	purple deadnettle	<i>Lamium purpureum</i> L.
PUSW	purslane speedwell	<i>Veronica serpyllifolia</i> L.
PUVI	puncturevine	<i>Tribulus terrestris</i> L.
QUGR	quackgrass	<i>Agropyron repens</i> (L.) Beauv.
RECL	red clover	<i>Trifolium pratense</i> L.
REFE	red fescue	<i>Festuca rubra</i> L.
RESO	red sorrel	<i>Rumex acetosella</i> L.
ROCI	rough cinquefoil	<i>Potentilla norvegica</i> L.
ROFB	rough fleabane	<i>Erigeron asper</i> Nutt.
RRPW	redroot pigweed	<i>Amaranthus retroflexus</i> L.

WEED LIST

<u>Abbr.</u>	<u>Common Name</u>	<u>Botanical Name</u>
RSFI	redstem filaree	<i>Erodium cicutarium</i> (L.) L'Hér. ex Ait.
RUTH	Russian thistle	<i>Salsola iberica</i> L.
SFGE	smallflower geranium	<i>Geranium pusillum</i> L.
SHPU	shepherdspurse	<i>Capsella bursa-pastoris</i> (L.) Medic.
SLSW	slender speedwell	<i>Veronica filiformis</i> Sm.
SMGC	smooth groundcherry	<i>Physalis subglabrata</i> Mackenz Bush
SPKW	spotted knapweed	<i>Centaurea stoebe</i> L.
SPSP	spotted spurge	<i>Euphorbia maculata</i> L.
STGR	stinkgrass	<i>Eragrostis cilianensis</i> (All.) E. Mosher
SWSW	swamp smartweed	<i>Polygonum coccineum</i> Muhl. ex Willd.
TAFE	tall fescue	<i>Festuca arundinacea</i> Schreb.
TLSW	thymeleaf sandwort	<i>Arenaria serpyllifolia</i> L.
TRCV	trailing crownvetch	<i>Coronilla caria</i> L.
TUPW	tumble pigweed	<i>Amaranthus albus</i> L.
VELE	velvetleaf	<i>Abutilon theophrasti</i> Medic.
VICR	Virginia creeper	<i>Parthenocissus quinquefolia</i> (L.) Planch.
VIPW	Virginia pepperweed	<i>Lepidium virginicum</i> L.
VOAS	volunteer asparagus	<i>Asparagus officinalis</i> L.
WESA	western salsify	<i>Tragopogon dubius</i> Scop.
WHCA	white campion	<i>Silene latifolia</i> Poir.
WHCL	white clover	<i>Trifolium repens</i> L.
WHHA	white heath aster	<i>Symphotrichum ericoides</i> L.
WIBW	wild buckwheat	<i>Polygonum convolvulus</i> L.
WICA	wild carrot	<i>Daucus carota</i> L.
WICH	wild chamomile	<i>Matricaria chamomilla</i> L.
WIGA	wild garlic	<i>Allium vineale</i> L.
WIGR	witchgrass	<i>Panicum capillare</i> L.
WIMU	wild mustard	<i>Sinapis arvensis</i> L.
WIRA	wild radish	<i>Raphanus raphanistrum</i> L.
WLDGRP	wild grape	<i>Vitis</i> sp.
WLDRASP	wild raspberry	<i>Rubus</i> sp.
YEFC	yellow fieldcress (kiek)	<i>Rorippa sylvestris</i> L.
YEFT	yellow foxtail	<i>Setaria glauca</i> (L.) Beauv.
YEHW	yellow hawkweed	<i>Hieracium caespitosum</i> Dumort.
YENS	yellow nutsedge	<i>Cyperus esculentus</i> L.
YERO	yellow rocket	<i>Barbarea vulgaris</i> R. Br.

CHEMICAL LIST

<u>COMMON NAME</u>	<u>TRADE NAME</u>	<u>FORMULATION</u>	<u>MANUFACTURER</u>
2,4-D amine	Weedar 64	3.8 L	Nufarm, Inc.
2,4-D choline salt	Embed, GF3335	3.8 L	Corteva
acetochlor	Breakfree	6.4 EC	DuPont
acetochlor	Harness	7.0 E	Monsanto
acetochlor	Surpass	6.4 E	Dow Agrosciences
acetochlor	Warrant	3 EC	Monsanto
acifluorfen	Ultra Blazer	2 L	UPI
ammonium soap of fatty acid	Finalsan	22.1% L	Neudorff
atrazine	AAtrex	4 L	Syngenta
atrazine 4.006 lb ai + pyroxasulfone 0.485 lb ai + fluthiacet-methyl 0.014 lb ai	Anthem ATZ	4.5 SE	FMC
bensulide	Prefar	4 EC	Gowan
bentazon	Basagran	4 L	Arysta
bicyclopyrone	A 16003E	1.67 SL	Syngenta
bicyclopyrone 0.06 lb ai + mesotrione 0.24 lb ai + S-metolachlor 2.14 lb ai + atrazine 1 lb ai + benoxacor 0.107 lb ai	Acuron	3.547 CS	Syngenta
bromoxynil	Moxy	2 EC	Winfield Solutions
carfentrazone	Aim	2 EC	FMC
chlorimuron-ethyl	Classic	25 WDG	DuPont
clethodim	Intensity One	0.97 EC	CPS
clethodim	Select Max	0.97 EC	Valent
clethodim	WE1557	2 EC	Wilbur Ellis
clomazone	Command	3 ME	FMC
clopyralid	Spur	3 EC	Albaugh
clopyralid	Stinger	3 EC	Dow Agrosciences
cloransulam-methyl	Firstrate	84 WDG	Dow Agrosciences
cycloate	Ro-Neet	6 EC	Helm Agro
DCPA	Dacthal	75 WP	AMVAC
dicamba	Clarity	4 L	BASF
diclobenil	Casoron G	4 G	Chemtura
diclobenil	Casoron L	1.4 CS	Chemtura
diflufenzopyr 21.4% + dicamba 55%	Distinct	76.4 WG	BASF
dimethenamid-P	Outlook	6 EC	BASF
dimethenamid-P	Tower	6 EC	BASF
diquat	Reglone	2 EC	Syngenta
diuron	Karmex	80 DF	Adama
EPTC	Eptam	7 EC	Gowan
ethalfluralin	Curbit	3 EC	CPS
ethalfluralin 1.6 lb ai + clomazone 0.5 lb ai	Strategy	2.1 EC	CPS
ethofumesate	Nortron SC	4 SC	Bayer CropScience
FeHEDTA	Fiesta	4.43% L	Neudorff
flazasulfuron	Mission	25 WG	ISK Bioscience
fluazifop-P	Fusilade DX	2 EC	Syngenta
flucarbazone	Everest	70 WDG	Arysta
flufenacet	Define	60 DF	Bayer CropScience
flufenacet 54.5% + metribuzin 13.6 %	Axiom	68 DF	Bayer CropScience
flumetsulam	Python	80 WDG	Dow Agrosciences

flumioxazin Chateau SW 51 WG Valent

CHEMICAL LIST

<u>COMMON NAME</u>	<u>TRADE NAME</u>	<u>FORMULATION</u>	<u>MANUFACTURER</u>
flumioxazin	Sureguard	51 WDG	Valent
fluthiacet	Cadet	0.91 EC	FMC
fluthiacet + mesotrione	Solstice	4L	FMC
fluroxypyr	Starane Ultra	2.8 L	Dow Agrosciences
fomesafen	Reflex	2 EC	Syngenta
fomesafen 10.2% + S-metolachlor 46.4%	Prefix	5.29 L	Syngenta
foramsulfuron	Option	35 EG	Bayer CropScience
glufosinate	Rely 280, Liberty 280	2.34 L	Bayer CropScience
glufosinate-ammonium	Lifeline	2.34 L	UPI
glufosinate-ammonium	Reckon 280	2.34 L	Solera
glyphosate	Durango	5.4 L	Dow Agrosciences
glyphosate	Roundup Original	4 L	Monsanto
glyphosate	Roundup PowerMax	5.5 L	Monsanto
glyphosate	Roundup Ultra	4 L	Monsanto
glyphosate	Roundup UltraMax	5 L	Monsanto
glyphosate	Roundup WeatherMax	5.5 L	Monsanto
glyphosate	Touchdown Total	4.17 L	Syngenta
halosulfuron	Permit	75 WG	Gowan
halosulfuron	Sandea	75 WG	Gowan
hexazinone	Velpar	2 L	DuPont
hexazinone	Velpar ULV	75 SG	DuPont
hexazinone + sulfometuron	Westar	75 WDG	DuPont
imazamox	Raptor	1 AS	BASF
imazapic	Plateau	70 WG	BASF
imazethapyr	Pursuit	2 EC	BASF
imazosulfuron	League	75 WDG	Valent
indaziflam	Alion 200	1.67 SC	Bayer CropScience
indaziflam	Alion 500	4.17 SC	Bayer CropScience
isoxaben	Trellis	75 DF	Dow Agrosciences
linuron	Lorox	50 DF	TKI NovaSource
mesotrione	Callisto	4 SC	Syngenta
metribuzin	Tricor	75 DF	UPI
napropamide	Devrinol DF-XT	50 DF	UPI
nicosulfuron	Accent	75 WDG	DuPont
nicosulfuron + mesotrione + isoxadifen-ethyl	Revulin Q	51.2 WDG	DuPont
norflurazon	Solicam	80 DF	TKI NovaSource
oryzalin	KFD-163-01	3.2 SC	UPI
oryzalin	Surflan	4 AS	UPI
oxyfluorfen	Goal 2XL	2 EC	Dow Agrosciences
oxyfluorfen	GoalTender	4 SC	Dow Agrosciences
oxyfluorfen	KFD-155-01	2 L	UPI
paraquat	Firestorm	3 L	Arysta
paraquat	Gramoxone SL	2 L	Syngenta
pelargonic acid	Scythe	4.2 EC	Gowan
pendimethalin	Prowl	3.3 EC	BASF
pendimethalin	Prowl H2O	3.8 ACS	BASF
pendimethalin	Satellite Hydrocap	3.8 SC	UPI
penoxsulam 0.083 lb ai + oxyfluorfen 3.93 lb ai	Pindar GT	4.013	Dow Agrosciences

phenmedipham Spin-Aid 1.3 L Bayer CropScience

CHEMICAL LIST

<u>COMMON NAME</u>	<u>TRADE NAME</u>	<u>FORMULATION</u>	<u>MANUFACTURER</u>
phenmedipham 0.6 lb ai + desmedipham 0.6 lb ai	Betamix	1.3 L	Bayer CropScience
prometryn	Caparol	4 L	Syngenta
pronamide	Kerb	3.3 SC	Dow Agrosciences
pyraflufen-ethyl	Venue	0.17 SC	Nichino
pyrazon	Pyramin	68 DF	Arysta
pyroxasulfone	Zidua	85 WDG	BASF
pyroxasulfone 2.087 lb ai + fluthiacet-methyl 0.063 lb ai	Anthem	2.15 SE	FMC
pyroxasulfone 4.174 lb ai + fluthiacet-methyl 0.126 lb ai	Anthem MAXX	4.30 SC	FMC
quinclorac	Quinstar	3.8 L	Albaugh
quizalofop-P-ethyl	Assure II	0.88 EC	DuPont
quizalofop-P-ethyl	Targa	0.88 EC	Gowan
rimisulfuron	Matrix	25 DF	DuPont
rimisulfuron	Solida	25 DF	FMC
saflufenacil	Sharpen	2.85 SC	BASF
saflufenacil	Treevix	70 WG	BASF
sethoxydim	Poast	1.53 EC	BASF
simazine	Princep	90 DF	Syngenta
S-metolachlor	Cinch	7.64 EC	DuPont
S-metolachlor	Dual Magnum	7.62 EC	Syngenta
S-metolachlor 3.34 lb ai + mesotrione 0.33 lb ai	Camix	3.67 L	Syngenta
S-metolachlor 2.68 lb ai + mesotrione 0.268 lb ai + atrazine 1.0 lb ai	Lumax	3.948 L	Syngenta
S-metolachlor II	Dual II Magnum	7.64 EC	Syngenta
sodium soap of asulam	Asulox	3.34 L	UPI
sulfentrazone	Spartan, Zeus	4 F	FMC
sulfentrazone + metribuzin	F4242	4 L	FMC
sulfentrazone 3.15 lb ai + carfentrazone 0.35 lb ai	Spartan Charge, Zeus Prime XC	3.5 SE	FMC
sulfentrazone 0.18 lb ai + metribuzin 0.27 lb ai	Authority MTZ	45 DF	FMC
sulfometuron	Oust XP	75 WDG	Bayer CropScience
sulfosulfuron	Maverick	75 WG	Monsanto
tembotrione	Laudis	3.5 SC	Bayer CropScience
terbacil	Sinbar	80 WDG	TKI NovaSource
tolpyralate	Shieldex 400 SC	3.33 L	Summit Agro USA
topramezone	Impact	2.8 L	Amvac
triclopyr	Garlon	3 SC	Dow Agrosciences
trifloxysulfuron	Envoke	75 WG	Syngenta
trifluralin	Treflan	4 EC	Helena
triflusulfuron	Upbeet	50 WDG	DuPont

ADJUVANTS

<u>TRADE NAME</u>	<u>ABBREVIATION</u>	<u>DESCRIPTION</u>	<u>MANUFACTURER</u>
Activator 90	NIS	nonionic surfactant	Loveland
Agri-dex	COC	heavy range paraffinic oil	Helena
ammonium nitrate	AN	100% salt	
ammonium sulfate	AMS	spray grade fertilizer	
copper sulfate		100% salt	
Freeway		organosilicone surfactant	Loveland
Herbimax	COC	80% paraffin base + petroleum oil + 20% surfactant	Loveland
LI6193-11	COC		Loveland
MSO		methylated seed oil	Helena
28% Nitrogen	UAN	28% urea ammonium nitrate solution	
N-Pak	AMS	34% ammonium sulfate liquid	Winfield Solution
Silwet L-77		organosilicone surfactant	Loveland
Sylgard 309		organosilicone surfactant	Dow Corning

ABBREVIATIONS USED IN THE REPORT

A =	Acre	NO. =	Number
a.i. / ai =	Active Ingredient	OM =	Organic Matter
Amt =	Amount	OZ =	Ounce
ACS =	Aqueous Capsule Suspension	P =	Probability
AMS =	Ammonium Sulfate	POH =	Post Harvest
AS =	Aqueous Solution	PO1 =	Postemergence 1
ASPA =	Asparagus	PO2 =	Postemergence 2
BIR =	Bicycloprrone	POST =	Postemergence
CEC =	Cation Exchange Capacity	POT =	Post Transplant
CRC =	Clarksville Research Center	PPI =	Preplant Incorporated
CS =	Capsule Suspension	PRE =	Preemergence
CV =	Coefficient of Variability	PREC. =	Precipitation (inches)
DF =	Dry Flowable	PRT =	Pretransplant
DIA =	Diameter	PSI =	Pounds per square inch
DIR =	Directed	PT PR =	Pint Product
DS =	Designator	QT =	Quart
EC =	Emulsifiable Concentrate	QT PR =	Quart Product
EPRE =	Early PRE	RCB / RCBD =	Randomized Complete Block Design
EPOS =	Early POST	RH =	Relative Humidity
F =	Flowable	REPS =	Replication
FALL =	Fall Application	SC =	Suspension Concentrate
FORM =	Formulation	SE =	Suspoemulsion
FM =	Formulation	SNBE =	Snapbean
FT =	Distance in FT	SP =	Soluble Powder
g / gr =	Gram	SPRING =	Spring Application
GAL =	Gallon	STBE =	Strawberry
GPA =	Gallon per acre	SURF =	Surface
GROW STG =	Growth Stage at time of Application	SWMREC =	Southwest Michigan Research and Extension Center
HTRC =	Horticulture Teaching and Research Center	T =	Temperature
IN =	Inch	TNRC =	Trevor Nichols Research Complex
KG =	Kilogram	TRT =	Treatment
L =	Liquid	UNMKTBL =	Unmarketable
LPRE =	Late PRE	UNTRT. =	Untreated
LPOS =	Late POST	VEG =	Vegetative
LO =	Low Odor	WDG =	Water Dispersible Granule
LS =	Leaf Stage	WSG =	Water Soluble Granule
LSD =	Least Significant Difference	WP =	Wettable Powder
LB =	Pounds	WT =	Weight
ME =	Microencapsulated	' =	Feet
MKTBL =	Marketable	" =	Inches
MPH =	Mile(s) per hour	Y =	Yes
MSU =	Michigan State University		
N =	No		
N/A =	Not Applicable/ Not Available		

TEMPERATURE AND PRECIPITATION DATA

MSU Horticulture Teaching and Research Center

Recorded at
MSU Horticulture Teaching and Research Center (HTRC)
East Lansing, Michigan
2018

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	36.2	24.5		1	83.6	56.3		1	82.7	58.0	0.07
2	41.7	16.4		2	85.5	64.6	0.01	2	66.2	51.6	
3	39.1	31.8	0.43	3	69.5	59.2	0.43	3	70.7	54.5	0.19
4	33.8	25.5	0.02	4	71.1	51.1	0.12	4	70.0	55.4	0.08
5	40.3	24.1		5	78.3	55.3		5	66.9	53.1	0.15
6	38.5	24.2	0.03	6	65.5	45.5		6	72.0	42.1	
7	32.3	17.4		7	68.8	37.8		7	82.3	52.8	
8	38.2	14.9		8	79.8	45.1		8	81.4	57.6	
9	39.5	27.9	0.01	9	79.0	49.1	0.16	9	68.9	59.9	0.32
10	44.3	21.9	0.06	10	66.4	51.5		10	69.0	57.1	
11	55.9	30.5		11	52.4	39.6	0.82	11	78.4	55.9	
12	69.6	42.0	0.12	12	53.4	40.2	0.62	12	77.5	53.7	
13	59.0	37.9	0.01	13	61.4	46.2	0.52	13	80.4	59.1	
14	39.4	28.1	0.89	14	75.5	48.9	0.09	14	82.2	49.6	
15	33.3	28.1	0.63	15	72.4	58.6	0.45	15	81.6	54.5	
16	36.9	29.1	0.12	16	78.3	48.2		16	84.4	63.7	0.07
17	35.3	25.1		17	74.9	49.7		17	92.8	66.4	
18	43.8	28.8	0.02	18	75.7	44.9	0.02	18	90.8	72.1	0.05
19	52.8	30.6		19	73.0	55.7	0.36	19	74.5	65.3	
20	56.7	26.0		20	60.2	48.3	0.02	20	71.3	58.0	0.23
21	57.3	27.7		21	64.4	45.9	0.48	21	77.6	53.8	
22	62.6	27.7		22	64.8	50.0	0.04	22	75.4	59.1	0.09
23	72.5	37.1		23	78.6	46.9		23	72.3	61.7	0.01
24	61.5	50.8	0.02	24	81.1	48.5		24	75.5	58.0	
25	58.4	38.6	0.02	25	86.2	51.8		25	75.3	51.9	
26	63.4	30.2		26	84.9	63.5		26	80.4	52.6	
27	60.4	36.0		27	90.6	59.2		27	75.2	63.7	0.26
28	53.3	36.7		28	91.9	59.2		28	85.6	60.5	
29	58.2	28.0		29	90.4	64.8		29	90.2	60.6	
30	72.6	28.4		30	86.6	68.9	0.74	30	91.5	74.7	
				31	85.0	67.9	0.09				

TEMPERATURE AND PRECIPITATION DATA

MSU Horticulture Teaching and Research Center

Recorded at
MSU Horticulture Teaching and Research Center (HTRC)
East Lansing, Michigan
2018

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	92.0	69.1		1	78.6	59.7	0.12	1	81.2	65.9	0.32
2	85.2	64.3		2	84.0	59.2		2	86.4	67.5	0.74
3	90.1	59.0		3	83.8	60.3	0.03	3	86.1	68.5	0.36
4	92.6	68.1		4	89.7	55.9		4	88.1	68.0	
5	92.4	72.4		5	91.8	70.2		5	87.6	70.8	0.37
6	78.4	52.6		6	79.5	68.4	0.41	6	71.9	60.3	0.02
7	81.0	45.1		7	84.0	66.3	0.06	7	67.2	55.2	
8	85.8	48.5		8	82.5	64.7	2.40	8	66.4	52.6	
9	88.8	54.8		9	82.3	60.1		9	63.6	50.8	0.10
10	86.9	62.5		10	82.6	61.0		10	64.5	52.4	0.01
11	83.8	53.3		11	83.8	56.2		11	75.3	47.1	
12	86.5	52.4		12	83.8	59.2		12	77.2	47.8	
13	89.0	63.1	0.34	13	83.7	58.6		13	78.2	51.4	
14	79.8	65.2	0.02	14	85.0	58.3		14	79.6	58.9	0.01
15	91.0	63.8	0.06	15	84.4	62.6		15	83.6	54.2	
16	89.8	68.2	0.01	16	79.2	65.3	0.11	16	85.1	58.3	
17	81.4	57.2		17	77.0	65.3	0.01	17	86.8	60.0	
18	80.5	59.3		18	81.6	62.7		18	84.0	59.6	
19	83.4	54.4		19	81.0	61.6		19	77.9	62.9	
20	81.1	63.7	0.16	20	78.9	61.3		20	80.4	62.8	1.44
21	75.5	64.5	0.26	21	77.3	65.0	0.16	21	78.2	56.4	0.05
22	71.9	62.3	0.01	22	75.5	53.2		22	64.6	45.2	
23	78.8	62.3	0.01	23	78.7	49.7		23	70.2	40.3	
24	82.0	65.6	0.01	24	74.5	52.0		24	66.3	45.9	0.04
25	84.3	59.1		25	76.7	64.7	0.56	25	79.1	65.2	0.05
26	79.9	59.7		26	84.4	65.1		26	66.8	43.2	
27	77.4	56.2		27	86.4	68.4		27	64.6	42.2	
28	78.7	51.7		28	86.1	66.8	0.71	28	61.3	45.8	0.05
29	82.3	50.2		29	78.1	60.8	0.02	29	59.7	35.4	0.04
30	82.5	55.0		30	73.6	51.5		30	50.2	40.5	0.47
31	77.0	55.2	0.19	31	81.1	52.6					

TEMPERATURE AND PRECIPITATION DATA

MSU Clarksville Research Center

Recorded at
MSU Clarksville Research Center (Clarksville)
Clarksville, Michigan
2018

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	33.9	20.9		1	81.4	56.5		1	83.2	59.3	
2	41.8	19.1		2	80.5	63.5	0.09	2	65.8	53.0	
3	35.9	30.9	0.42	3	68.5	55.5	0.38	3	69.6	53.9	0.43
4	31.2	24.0	0.01	4	67.2	49.7	0.28	4	70.6	53.5	0.13
5	37.3	20.3		5	76.5	53.9		5	69.6	51.4	
6	33.6	22.5	0.09	6	65.9	46.9		6	73.0	44.2	
7	29.2	17.6		7	71.2	40.0		7	83.2	53.9	
8	41.8	15.2		8	76.7	50.3		8	82.1	57.2	
9	37.8	26.9	0.06	9	78.7	51.9	0.09	9	69.2	56.9	0.35
10	43.6	22.6		10	65.4	49.7	0.02	10	66.5	55.2	
11	52.1	31.8	0.01	11	49.9	36.8	0.54	11	78.9	55.0	
12	64.0	40.6	0.29	12	56.2	38.6	0.52	12	78.9	56.9	
13	47.2	35.3	0.03	13	63.0	43.3	0.29	13	76.8	57.6	
14	35.6	25.8	1.11	14	73.9	48.8	0.05	14	81.7	53.0	
15	31.8	25.5	0.47	15	74.0	56.1	0.35	15	85.0	55.4	
16	32.5	27.8	0.40	16	78.3	49.2		16	84.3	64.7	0.06
17	32.1	23.3	0.01	17	74.4	47.1		17	91.4	68.6	
18	40.3	25.7	0.01	18	74.9	45.4	0.03	18	87.9	71.3	0.07
19	54.5	27.9	0.04	19	64.8	52.1	0.76	19	75.7	65.0	0.01
20	60.5	26.4		20	58.9	48.7		20	75.5	60.3	
21	59.3	30.3		21	57.5	46.5	0.73	21	76.9	55.1	
22	63.4	34.6		22	63.0	50.5		22	74.7	56.1	0.02
23	71.5	35.1		23	79.4	44.1		23	70.9	59.8	
24	61.3	49.8	0.10	24	82.9	50.1		24	76.4	58.5	0.05
25	60.5	39.5	0.01	25	84.9	59.1		25	77.8	53.0	
26	60.9	31.4		26	82.9	64.7		26	81.2	51.5	
27	59.4	40.4		27	89.9	58.1		27	77.9	63.4	1.06
28	54.7	33.1		28	92.1	61.0		28	84.2	57.5	
29	58.6	24.1		29	91.0	65.6		29	90.0	61.9	
30	71.4	29.0		30	86.1	64.7	0.96	30	91.7	75.6	
				31	83.6	68.4	0.35				

TEMPERATURE AND PRECIPITATION DATA

MSU Clarksville Research Center

Recorded at
MSU Clarksville Research Center (Clarksville)
Clarksville, Michigan
2018

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	91.1	71.4	0.06	1	82.6	60.3	0.01	1	78.5	65.8	0.74
2	86.7	65.8		2	83.6	62.3	0.57	2	85.6	66.4	0.73
3	89.1	61.0		3	80.9	61.8		3	84.3	66.7	0.02
4	92.1	70.0		4	89.8	56.4		4	88.1	67.6	
5	90.9	72.8		5	89.5	69.9		5	86.8	66.8	0.06
6	80.1	58.1		6	77.5	67.3	0.46	6	74.5	58.4	0.07
7	83.1	49.2		7	82.8	63.9	0.08	7	68.1	52.4	
8	86.2	54.1		8	80.6	63.1	0.29	8	65.4	51.7	
9	86.4	58.3		9	80.3	61.5	0.01	9	66.4	49.3	
10	87.8	65.5		10	84.7	62.2		10	69.3	51.8	
11	86.3	56.6		11	84.7	56.5	0.02	11	76.3	47.4	
12	85.4	56.5		12	87.2	59.8		12	80.3	50.9	
13	89.8	65.0		13	86.8	60.5		13	78.3	53.5	
14	81.2	68.2		14	86.2	58.3		14	81.1	55.4	
15	91.4	63.0	0.15	15	86.8	64.4		15	84.7	55.6	
16	89.6	66.4	0.01	16	85.0	63.3		16	88.6	59.8	
17	81.1	58.5		17	75.8	64.2	1.00	17	89.6	60.0	
18	81.1	51.4		18	82.8	62.8		18	81.1	61.6	
19	84.6	54.3		19	83.1	64.1		19	76.7	58.8	0.01
20	82.3	64.4	0.39	20	78.8	62.6		20	83.9	57.9	0.01
21	75.8	63.9	0.39	21	75.4	62.7	0.14	21	77.6	52.9	
22	74.1	62.2	0.08	22	76.7	54.9		22	66.3	42.5	
23	73.0	63.0	0.08	23	77.8	53.7		23	72.0	42.5	
24	82.5	61.7		24	74.3	54.5	0.01	24	71.0	45.8	0.01
25	83.7	61.3		25	75.0	63.8	0.32	25	80.0	63.3	
26	77.5	59.2	0.01	26	85.7	68.7	0.19	26	64.0	46.0	
27	73.8	56.0	0.02	27	86.0	67.5	0.51	27	63.4	44.7	
28	76.8	53.6		28	85.4	64.6	2.62	28	57.8	42.5	0.05
29	79.3	51.5		29	74.5	54.5	0.23	29	58.4	38.3	0.05
30	86.2	55.4		30	75.2	48.8		30	47.9	38.9	0.86
31	80.5	55.6	0.03	31	81.9	53.3					

TEMPERATURE AND PRECIPITATION DATA

MSU Southwest Michigan Research and Extension Center

Recorded at
MSU Southwest Michigan Research and Extension Center (Benton Harbor)
Benton Harbor, Michigan
2018

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	34.2	23.5		1	83.6	56.6		1	77.5	55.2	
2	42.2	18.0		2	83.4	62.9	0.49	2	78.6	54.1	
3	40.4	34.5	0.29	3	70.0	56.8	1.70	3	72.3	59.6	0.44
4	35.0	25.3	0.02	4	68.3	53.6		4	73.1	54.9	
5	41.4	25.0		5	79.1	53.1		5	71.5	48.7	0.34
6	36.5	25.9	0.09	6	70.4	47.9		6	74.3	48.5	
7	30.0	20.1		7	67.4	44.4		7	82.5	59.7	
8	38.2	17.2		8	77.8	51.7		8	76.2	58.7	
9	38.3	25.4	0.01	9	79.1	57.4	0.16	9	75.1	62.5	0.20
10	43.2	24.2		10	64.8	53.8	0.03	10	68.6	60.3	0.52
11	56.5	34.9		11	54.7	44.9	0.59	11	72.2	61.2	
12	69.1	47.5	0.12	12	55.5	44.9	0.10	12	75.4	63.9	
13	64.6	46.1	0.01	13	63.4	48.8	0.41	13	75.0	56.3	
14	46.6	32.5	0.83	14	75.8	52.2	1.35	14	78.6	52.3	
15	40.2	31.3	1.09	15	69.6	49.1	0.54	15	86.1	56.3	
16	35.2	28.6	0.05	16	75.9	46.9		16	88.7	67.5	0.21
17	35.8	27.5	0.01	17	80.2	50.2		17	93.8	71.8	
18	42.1	26.7	0.09	18	77.1	53.2	0.15	18	94.4	69.2	
19	42.1	30.4	0.03	19	63.1	53.6	0.32	19	76.6	66.8	0.65
20	54.0	25.4		20	61.7	48.7	0.02	20	70.3	63.3	0.07
21	55.9	29.8		21	60.0	54.2	0.33	21	70.4	62.3	1.41
22	64.3	40.7		22	59.5	47.6	0.02	22	67.8	56.9	0.71
23	74.0	40.9		23	74.4	43.7		23	71.2	59.2	
24	62.3	47.4		24	83.6	53.5		24	71.5	58.4	
25	49.4	36.1		25	87.5	59.7		25	80.0	60.1	
26	59.8	30.5		26	83.6	65.1	0.06	26	77.8	62.5	0.16
27	49.4	37.4	0.24	27	94.6	61.6		27	71.3	61.0	0.81
28	43.2	35.9	0.04	28	96.4	62.6		28	82.2	57.7	
29	51.1	28.9		29	92.9	68.1	0.23	29	90.8	65.0	
30	75.5	33.4		30	86.9	67.6	0.73	30	92.9	75.3	
				31	86.1	67.2					

TEMPERATURE AND PRECIPITATION DATA

MSU Southwest Michigan Research and Extension Center

Recorded at
MSU Southwest Michigan Research and Extension Center (Benton Harbor)
Benton Harbor, Michigan
2018

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	91.4	72.8	0.31	1	81.9	61.6		1	83.0	69.0	2.03
2	77.4	63.9		2	86.2	64.7	0.24	2	88.2	68.3	0.04
3	91.1	63.1	0.02	3	80.4	60.2		3	87.6	68.2	0.26
4	90.6	72.0		4	90.9	63.0		4	90.0	69.0	
5	86.9	71.4	0.30	5	90.3	70.6		5	88.4	70.4	0.10
6	78.6	61.4		6	80.5	67.9	0.27	6	70.9	63.3	0.19
7	81.2	55.5		7	80.6	65.8	0.11	7	69.2	57.1	
8	83.6	58.0		8	77.2	63.5	0.03	8	66.4	55.9	
9	86.5	59.7		9	85.6	61.8	0.02	9	70.7	52.0	
10	86.1	66.7		10	82.4	67.8	0.01	10	68.5	52.9	
11	84.3	62.3		11	84.2	60.9		11	77.4	50.2	
12	86.2	64.3		12	85.6	61.9		12	79.6	52.5	
13	89.4	67.0		13	84.2	62.1		13	77.6	55.8	
14	77.9	70.1	0.06	14	85.4	62.5		14	81.2	55.1	
15	87.2	69.5		15	84.2	66.4	0.02	15	83.0	59.8	
16	86.1	66.5		16	83.2	66.6		16	87.1	66.6	
17	79.8	60.9		17	80.6	65.9	0.04	17	87.1	65.1	
18	77.6	54.4		18	79.3	63.3		18	77.1	63.3	
19	86.8	56.1	0.04	19	84.2	61.0		19	78.4	58.6	0.01
20	83.7	66.6	0.88	20	77.9	64.2	0.02	20	90.6	58.0	
21	77.1	66.6	0.26	21	75.6	64.6	1.24	21	78.9	58.6	0.13
22	77.1	66.3	0.11	22	73.5	56.9		22	66.4	47.6	
23	75.2	64.8		23	77.8	52.8		23	73.2	46.9	
24	77.6	65.8		24	71.5	58.6	0.02	24	74.5	52.2	
25	81.1	62.5		25	77.8	64.2	0.04	25	79.9	63.0	0.26
26	76.5	61.9		26	89.3	68.8		26	65.8	46.9	
27	71.6	57.5		27	90.0	74.9		27	65.9	46.5	
28	75.4	55.2		28	88.7	66.2	1.31	28	63.7	49.2	0.08
29	79.3	54.6		29	74.3	58.1	0.20	29	59.8	39.1	0.08
30	79.3	56.8		30	72.3	51.3		30	67.2	44.9	0.02
31	75.9	57.6	0.16	31	82.6	55.7					

TEMPERATURE AND PRECIPITATION DATA

Fremont

Recorded at
City of Fremont
Fremont, Michigan
2018

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	32.1	23.3		1	78.3	56.6		1	79.2	58.4	
2	40.6	16.4		2	74.6	56.9	0.51	2	72.6	55.4	
3	35.8	30.6	0.28	3	66.4	56.0	0.39	3	68.8	53.0	0.54
4	30.9	21.5	0.07	4	64.1	45.1	0.15	4	70.2	50.9	0.23
5	35.9	18.2	0.02	5	76.2	46.0		5	68.2	49.2	0.01
6	34.7	24.0	0.09	6	69.3	49.0	0.02	6	70.6	41.7	
7	27.4	15.9	0.01	7	70.5	41.6		7	80.6	50.5	
8	39.4	13.2		8	74.4	51.6		8	83.9	56.8	
9	38.6	26.5		9	74.2	52.9	0.08	9	70.2	58.5	0.50
10	42.7	19.8		10	64.7	44.9		10	68.1	58.0	0.01
11	53.0	32.5	0.01	11	45.2	37.9	0.42	11	80.5	56.0	
12	57.8	38.3	0.19	12	60.4	39.6	0.13	12	81.2	58.4	
13	40.0	35.4	0.43	13	67.6	41.7	0.01	13	77.3	57.5	
14	36.4	26.9	0.65	14	71.4	48.9	0.10	14	83.6	50.7	
15	32.7	25.9	0.43	15	79.4	57.7	0.03	15	79.0	54.5	
16	33.3	27.2	0.37	16	78.9	48.3		16	83.8	65.1	
17	33.1	24.2	0.01	17	80.8	49.0		17	88.4	67.8	
18	42.1	29.3	0.01	18	77.6	48.6	0.14	18	84.4	66.9	0.23
19	48.7	26.1	0.20	19	63.2	50.5	0.32	19	71.2	62.3	0.05
20	59.1	25.3		20	66.3	44.9	0.23	20	77.8	57.8	0.14
21	58.4	26.9		21	59.0	46.7	0.30	21	78.6	56.4	
22	64.4	29.4		22	70.3	49.7	0.01	22	80.0	57.7	
23	71.8	36.1		23	76.6	43.6		23	76.6	61.6	
24	60.5	47.8		24	79.5	49.4		24	79.1	60.1	0.39
25	56.7	39.3		25	85.0	55.1		25	78.5	56.7	
26	58.7	27.2		26	84.1	62.1		26	77.7	53.4	
27	57.8	39.3		27	90.8	58.7		27	78.9	63.4	0.23
28	50.8	32.4		28	95.2	62.1		28	84.2	55.7	
29	58.1	26.3		29	91.9	65.9		29	90.3	60.8	
30	68.6	28.4		30	88.1	66.6	0.31	30	90.6	75.9	
				31	81.5	65.9	0.11				

TEMPERATURE AND PRECIPITATION DATA

Fremont

Recorded at
City of Fremont
Fremont, Michigan
2018

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	91.5	72.9	0.19	1	81.6	63.9		1	74.7	65.6	0.64
2	86.9	63.8		2	80.2	62.4	0.01	2	84.0	65.3	1.35
3	90.5	57.5		3	80.5	58.4		3	77.5	67.5	0.14
4	90.0	70.4		4	90.4	56.3		4	85.6	69.0	0.02
5	90.4	71.2		5	87.5	72.0		5	83.5	64.8	0.54
6	83.8	55.6		6	78.7	66.4	0.30	6	72.5	54.7	0.01
7	83.3	51.9		7	80.9	63.1	0.06	7	68.8	49.6	
8	82.9	51.6		8	83.0	62.2		8	68.8	51.3	
9	85.2	55.2		9	86.2	61.5	0.01	9	68.9	50.0	
10	89.5	63.6		10	89.3	59.8		10	75.8	50.9	
11	88.9	55.0		11	89.4	58.7		11	74.2	51.7	
12	82.4	57.3		12	90.9	58.6		12	79.9	52.7	
13	86.5	69.2		13	90.4	61.3		13	76.5	52.6	
14	78.9	68.1		14	88.6	58.7		14	84.9	54.8	
15	88.6	62.9		15	87.8	62.5		15	83.5	55.1	
16	89.8	62.1		16	89.2	66.0		16	84.8	61.0	
17	80.1	56.8		17	80.7	65.0	0.01	17	85.7	61.7	
18	82.6	47.3		18	86.0	62.5	0.01	18	77.4	59.9	
19	84.7	49.7		19	82.7	61.2		19	76.9	53.7	
20	84.2	63.9	0.06	20	80.3	59.2		20	78.3	54.6	0.40
21	74.2	65.0	0.83	21	77.5	61.3	1.34	21	79.7	54.1	
22	80.8	64.8	0.06	22	77.9	56.2		22	67.1	40.0	
23	78.0	63.9		23	77.8	50.9		23	72.4	41.3	
24	85.3	65.8		24	74.2	55.1	0.12	24	73.3	49.1	
25	84.3	59.3		25	74.0	62.7	0.10	25	75.2	63.6	
26	75.7	59.8	0.19	26	85.4	66.5	0.57	26	63.9	43.1	0.02
27	71.5	56.9		27	84.9	49.2	2.55	27	64.6	40.9	
28	76.1	53.6	0.01	28	83.0	64.5	1.45	28	57.7	40.8	0.01
29	78.7	50.7		29	71.5	52.0	0.46	29	56.0	37.0	0.02
30	85.6	53.2		30	73.7	48.6		30	50.1	40.7	0.47
31	83.5	56.5		31	80.8	53.3					

TEMPERATURE AND PRECIPITATION DATA

Hart

Recorded at
Asparagus Research Farm
Hart, Michigan
2018

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	29.5	23.0		1	76.9	56.2		1	69.8	54.4	
2	39.6	15.9		2	74.4	52.1	0.73	2	73.1	53.5	
3	36.9	29.8	0.06	3	64.7	47.1	0.33	3	67.1	55.3	0.32
4	30.2	23.9	0.01	4	63.6	41.0	0.26	4	71.7	49.2	0.13
5	34.0	22.9	0.05	5	76.8	43.2		5	64.9	46.6	0.01
6	34.3	25.1		6	68.0	47.4	0.01	6	69.5	41.6	
7	26.0	10.5		7	67.8	38.6		7	72.4	48.7	
8	35.9	7.10	0.02	8	76.2	55.6		8	81.8	54.0	
9	41.2	23.6	0.01	9	72.8	52.2	0.25	9	70.9	59.0	
10	39.9	21.3		10	62.4	42.2		10	71.0	60.6	
11	48.8	32.7	0.02	11	42.4	38.2	0.39	11	80.9	53.9	
12	54.5	34.0	0.17	12	61.6	39.4	0.06	12	81.2	60.3	
13	41.0	35.5	0.42	13	65.8	41.4	0.03	13	76.8	53.8	
14	35.8	27.0	0.67	14	71.6	47.6		14	82.8	49.0	
15	33.8	26.3	0.15	15	69.9	50.1	0.59	15	75.2	54.1	
16	32.9	27.6	0.23	16	76.3	48.0		16	80.1	63.2	0.08
17	32.7	25.6	0.03	17	79.6	50.2		17	87.9	71.4	
18	44.2	29.6	0.15	18	78.8	50.3	0.03	18	78.1	65.6	0.18
19	45.9	28.6		19	59.6	47.4	0.20	19	71.4	62.9	
20	52.7	22.9		20	59.3	43.1	0.01	20	74.7	57.7	
21	56.9	25.7		21	59.5	42.0	0.10	21	82.2	54.3	
22	62.6	26.0		22	61.9	46.5	0.02	22	81.4	56.8	
23	71.2	36.2		23	75.0	42.6		23	75.7	56.9	
24	60.1	46.1		24	80.0	49.6		24	78.5	56.8	0.01
25	51.1	29.7		25	85.1	65.2		25	79.9	56.9	0.14
26	57.9	25.6		26	83.2	59.2		26	80.5	54.5	
27	49.9	37.5	0.02	27	88.3	63.1		27	76.6	57.2	0.33
28	45.9	30.2		28	91.2	60.8		28	81.0	55.4	
29	48.2	19.5		29	94.8	64.0		29	89.0	60.4	
30	68.4	31.0		30	87.0	68.5	0.85	30	89.3	74.7	
				31	78.8	63.0	0.13				

TEMPERATURE AND PRECIPITATION DATA

Hart

Recorded at
Asparagus Research Farm
Hart, Michigan
2018

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	90.0	70.1	0.44	1	83.9	63.1		1	74.2	67.6	1.21
2	80.0	61.4		2	78.3	62.5		2	81.7	67.0	1.19
3	90.3	58.4		3	79.3	53.5		3	77.7	68.7	0.01
4	91.1	72.6		4	91.2	58.8		4	85.9	69.4	0.34
5	84.8	69.1		5	88.0	75.1		5	82.4	64.5	0.48
6	78.8	53.0		6	79.1	64.0	0.17	6	75.1	54.4	
7	79.8	50.0		7	79.4	60.3		7	68.2	47.2	
8	82.9	50.6		8	78.8	55.5		8	69.5	50.2	
9	85.7	53.8		9	80.6	65.9	0.06	9	68.0	46.0	
10	85.3	64.7		10	86.8	53.5		10	72.2	46.7	
11	83.4	54.9		11	85.7	58.6		11	74.1	49.9	
12	84.0	60.6	0.04	12	88.3	55.1		12	78.3	55.3	
13	86.0	71.0	0.01	13	85.2	56.6		13	76.0	52.8	
14	81.0	66.0	0.02	14	87.4	59.2		14	80.5	55.1	0.01
15	88.9	63.9		15	86.0	64.7		15	82.8	53.4	
16	82.0	61.9		16	83.4	63.4		16	85.5	58.2	
17	76.3	53.7		17	81.6	63.1		17	85.7	63.5	
18	76.9	44.3		18	80.2	58.8		18	72.5	56.2	
19	85.4	49.1		19	83.8	55.6		19	77.3	53.5	0.02
20	83.0	63.8	0.46	20	79.0	57.5		20	80.3	51.0	0.13
21	74.1	65.4	0.42	21	76.3	62.0	1.32	21	80.5	53.5	
22	80.5	65.6	0.03	22	73.2	52.7		22	64.7	41.1	
23	74.4	64.6	0.10	23	79.3	51.4		23	71.1	41.7	
24	80.5	62.9		24	75.2	58.1		24	74.4	48.5	
25	80.6	59.7		25	76.0	63.2	0.36	25	75.9	61.4	0.10
26	73.2	62.0	0.32	26	84.7	63.1	0.41	26	62.4	44.0	0.06
27	69.5	60.0	0.01	27	84.3	67.4	1.68	27	65.6	42.7	0.02
28	73.1	52.0	0.01	28	82.2	64.9	1.32	28	56.8	49.1	0.41
29	80.2	52.0		29	68.4	51.7	0.63	29	51.9	43.4	
30	80.9	55.8		30	71.5	45.5		30	50.1	42.0	0.10
31	82.9	56.2		31	78.5	54.1					

TEMPERATURE AND PRECIPITATION DATA

Hudsonville

Recorded at
Michigan Celery Cooperative
Hudsonville, Michigan
2018

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	33.1	23.6		1	82.3	57.1		1	82.9	63.3	
2	42.2	21.1		2	81.6	60.8	0.16	2	70.1	57.3	
3	38.8	32.9	0.38	3	69.5	59.2	0.27	3	70.0	57.1	0.57
4	33.2	25.6	0.01	4	66.1	47.3	0.15	4	71.4	52.9	0.03
5	37.3	22.7		5	77.1	51.7		5	71.9	54.9	0.03
6	35.6	22.3	0.05	6	68.6	48.0		6	74.4	45.9	
7	27.8	18.2		7	71.3	40.9		7	84.4	53.6	
8	40.4	17.8		8	77.1	51.1		8	82.4	56.7	
9	39.8	26.0		9	77.9	52.1	0.37	9	71.9	60.2	0.35
10	42.6	21.8		10	64.9	51.7		10	67.7	58.2	
11	52.5	34.5	0.02	11	54.8	39.8	0.42	11	79.3	60.2	0.02
12	62.9	38.3	0.24	12	56.3	41.0	0.63	12	76.9	61.3	
13	45.9	29.0	0.05	13	63.5	46.8	0.41	13	78.4	58.0	
14	38.1	29.3	0.94	14	72.6	49.3	0.18	14	83.2	52.5	
15	35.1	28.9	0.42	15	77.0	56.8	0.33	15	86.7	55.7	
16	34.3	30.8	0.06	16	79.5	53.1		16	83.5	65.9	0.57
17	33.7	27.2		17	80.6	47.9		17	89.9	70.7	
18	42.4	30.4	0.10	18	76.8	50.6	0.06	18	87.9	71.2	0.15
19	52.2	30.5		19	64.2	52.2	0.35	19	74.3	67.8	0.03
20	57.0	26.3		20	64.5	51.5	0.01	20	74.3	62.5	
21	57.3	29.4		21	57.2	49.6	0.57	21	75.1	58.4	
22	63.7	33.2		22	64.4	47.3		22	75.9	60.1	
23	72.6	39.4		23	77.0	43.4		23	75.8	60.0	
24	62.2	42.2	0.01	24	81.8	50.1		24	75.9	59.6	0.03
25	57.3	43.3		25	83.8	59.0		25	77.5	58.4	
26	60.0	29.5		26	82.3	63.6	0.02	26	79.8	57.2	0.06
27	60.4	43.2		27	90.8	57.8		27	78.9	62.6	0.39
28	53.9	34.7		28	94.5	60.5		28	81.8	57.7	
29	57.4	22.7		29	93.7	67.6		29	90.8	62.3	
30	73.7	27.5		30	85.9	69.5	0.67	30	92.0	77.6	
				31	82.0	67.1	0.24				

TEMPERATURE AND PRECIPITATION DATA

Hudsonville

Recorded at
Michigan Celery Cooperative
Hudsonville, Michigan
2018

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	91.8	73.4	0.22	1	81.4	63.4		1	80.3	69.6	0.09
2	81.0	64.0		2	83.0	64.7		2	86.2	68.5	0.13
3	90.9	60.3		3	81.9	61.1		3	82.9	68.3	0.12
4	91.4	73.4		4	90.8	57.5		4	89.0	67.1	0.14
5	86.8	70.3		5	89.3	71.4		5	86.7	69.3	0.13
6	81.3	59.9		6	80.2	67.6	0.27	6	74.5	60.3	0.09
7	82.7	51.2		7	81.8	63.7		7	69.1	56.3	0.05
8	85.6	53.0		8	79.9	64.4	0.01	8	67.7	56.0	0.05
9	84.5	58.6		9	81.6	62.6		9	68.9	53.9	0.02
10	88.8	67.7		10	85.4	63.2		10	75.0	54.8	0.01
11	87.7	58.2		11	85.7	57.1		11	76.9	53.5	
12	83.4	59.6		12	90.8	58.6		12	80.3	51.8	
13	87.3	68.9		13	90.8	60.5		13	77.9	54.4	
14	81.1	68.8		14	88.1	58.7		14	85.4	53.5	
15	88.4	64.9		15	87.1	65.9		15	82.6	55.3	
16	87.4	63.5		16	86.7	66.3		16	87.0	64.3	
17	80.5	61.3		17	79.1	66.9	0.07	17	88.5	61.4	
18	82.0	49.2		18	86.3	61.2		18	83.6	63.0	
19	85.4	52.2		19	85.5	61.8		19	80.1	56.6	
20	83.2	65.8	0.23	20	78.6	63.8		20	85.1	64.4	0.95
21	78.3	66.6	0.93	21	80.0	63.1	0.10	21	81.4	54.3	0.01
22	76.7	64.0	0.05	22	77.8	55.8		22	65.9	45.4	
23	74.6	64.5	0.04	23	80.5	51.4		23	70.4	42.9	
24	82.9	65.4		24	76.9	57.5	0.02	24	72.1	49.9	
25	83.8	59.6		25	77.5	63.6		25	79.5	64.8	0.05
26	76.4	60.3	0.02	26	87.9	66.6	0.01	26	65.8	53.1	0.01
27	72.6	57.1	0.02	27	87.9	67.0	0.16	27	66.0	47.5	
28	76.6	54.2		28	87.2	66.3	0.12	28	59.2	43.7	0.04
29	79.3	53.5	0.08	29	71.8	56.8	0.14	29	59.5	37.8	0.02
30	81.8	56.4	0.12	30	73.6	48.9	0.04	30	50.2	41.2	0.20
31	79.0	56.9		31	82.1	55.3	0.09				

TEMPERATURE AND PRECIPITATION DATA

Imlay City

Recorded at
Lapeer USDA/NRCS Office
Lapeer, Michigan
2018

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	38.4	24.1		1	85.2	47.9		1	81.2	55.0	0.03
2	45.1	15.7		2	84.7	65.3	0.03	2	72.4	48.7	
3	41.9	28.9	0.60	3	68.0	51.6	0.64	3	73.8	53.2	0.02
4	33.7	24.0	0.11	4	75.1	50.0	0.08	4	72.4	55.6	
5	39.9	20.2		5	79.5	49.2		5	65.3	45.7	
6	41.2	21.4	0.08	6	70.2	44.3	0.02	6	72.6	38.1	
7	34.1	16.6		7	69.2	34.4		7	82.7	56.6	
8	39.0	13.7		8	79.8	41.7	0.08	8	83.0	54.6	
9	38.2	25.5		9	77.5	45.3	0.02	9	67.4	55.8	0.24
10	45.6	27.5	0.08	10	65.3	39.1	0.01	10	70.0	56.9	0.49
11	57.9	27.5		11	47.1	36.4	0.55	11	79.3	54.4	
12	72.0	37.2	0.08	12	59.7	38.3	0.26	12	78.3	48.9	0.03
13	50.5	34.5	0.08	13	69.7	44.1	0.22	13	81.7	53.2	
14	37.4	27.3	1.19	14	77.7	50.0		14	83.5	49.9	
15	33.5	26.1	0.89	15	72.2	47.3	0.33	15	81.8	47.0	
16	36.5	28.7	0.38	16	80.9	42.0		16	83.5	59.9	0.16
17	35.4	25.8	0.01	17	72.0	47.7		17	92.3	61.0	
18	39.7	29.5		18	73.1	44.7		18	90.3	68.3	0.38
19	49.9	30.1	0.06	19	77.9	52.8	0.29	19	76.7	60.5	
20	55.2	24.2		20	61.4	46.0	0.01	20	74.3	57.4	
21	60.3	26.0		21	65.2	38.1	0.06	21	78.6	48.2	
22	61.7	26.2		22	64.6	48.4	0.03	22	74.8	53.9	
23	70.8	29.3		23	82.5	43.6		23	80.3	61.5	
24	67.6	49.0	0.03	24	83.6	47.2		24	75.4	56.5	0.10
25	51.0	37.6	0.04	25	87.8	53.3		25	74.5	46.7	
26	64.1	29.4		26	84.6	61.5		26	79.4	43.2	0.03
27	63.4	31.3		27	91.1	59.8		27	78.2	61.5	0.97
28	51.7	28.0		28	91.5	58.6		28	86.3	62.9	0.01
29	57.4	24.2		29	88.4	62.5		29	89.5	60.1	
30	72.8	29.0		30	84.3	64.8	0.49	30	91.3	73.6	
				31	86.2	68.0	0.03				

TEMPERATURE AND PRECIPITATION DATA

Imlay City

Recorded at
Lapeer USDA/NRCS Office
Lapeer, Michigan
2018

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	91.5	68.7		1	80.4	58.8	0.61	1	86.4	61.3	0.35
2	85.4	64.8		2	85.5	57.3		2	88.8	69.1	0.08
3	89.6	56.8		3	86.6	59.4		3	86.9	68.3	0.07
4	90.9	64.7	0.17	4	88.4	56.2		4	89.8	66.8	0.04
5	90.2	69.9	0.04	5	91.5	65.9		5	90.8	69.2	0.16
6	75.9	50.3		6	82.4	68.7	0.15	6	75.8	57.3	0.02
7	79.6	43.9		7	86.4	65.1		7	70.1	51.1	
8	86.6	48.3		8	80.6	64.1	1.57	8	65.6	49.9	
9	88.6	54.8		9	85.0	59.9		9	64.1	49.9	0.01
10	85.3	57.3		10	81.8	56.0		10	62.9	53.9	0.08
11	84.3	50.0		11	84.3	52.5		11	77.0	54.4	
12	83.8	48.1		12	82.5	58.3	0.18	12	76.7	47.2	
13	91.2	59.2	0.01	13	86.5	57.7		13	75.6	52.6	0.01
14	82.9	63.7		14	87.3	57.6		14	83.7	58.7	
15	90.1	66.5		15	85.0	62.9		15	85.2	58.7	
16	90.1	68.7		16	78.1	62.0	0.02	16	85.6	57.1	
17	82.2	55.9		17	79.1	68.4	0.02	17	89.0	59.5	
18	82.7	50.0		18	84.7	62.9		18	81.6	59.3	
19	82.6	50.6		19	80.9	59.8		19	72.0	59.5	
20	85.3	57.2		20	79.8	57.5		20	72.4	56.2	0.34
21	71.5	67.0	0.85	21	80.1	62.1	0.50	21	81.3	55.3	0.04
22	68.1	61.3	0.20	22	75.0	53.3	0.01	22	66.7	44.4	
23	83.7	58.8	0.02	23	82.1	49.3		23	70.9	38.8	
24	82.3	64.1	0.01	24	78.2	50.6		24	65.6	45.0	0.01
25	84.9	61.2		25	77.3	63.6	0.45	25	76.4	64.8	0.11
26	82.7	60.0		26	85.5	64.0		26	70.8	43.0	
27	79.1	54.5		27	89.3	66.2	0.78	27	62.7	37.8	
28	79.9	53.8		28	89.0	69.7	0.31	28	61.5	44.3	0.10
29	82.2	52.4		29	80.3	62.9	0.39	29	60.5	34.9	0.01
30	82.6	52.8		30	71.8	52.6		30	51.2	42.0	0.54
31	80.1	53.2	0.18	31	79.2	53.2					

TEMPERATURE AND PRECIPITATION DATA

Momence

Recorded at
 Stelle, Illinois Climate Network Station
 Stelle, Illinois
 2018

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	33.6	21.6		1	85.0	42.4		1	86.9	55.1	
2	43.2	16.5		2	89.1	63.1	0.09	2	83.2	51.7	0.16
3	48.1	34.1	0.26	3	75.2	60.8	0.42	3	82.9	58.6	
4	35.6	26.7	0.03	4	74.9	54.5	0.06	4	79.6	51.6	
5	43.6	21.3	0.08	5	81.7	49.2		5	86.9	53.7	0.01
6	41.6	22.9		6	78.3	49.9	0.01	6	85.2	51.8	
7	37.9	18.8		7	76.3	44.8		7	92.1	64.2	0.85
8	42.7	18.4	0.04	8	80.7	47.2		8	81.1	62.5	0.01
9	39.6	30.2	0.02	9	85.3	52.6	0.86	9	82.9	64.5	0.74
10	46.0	30.0		10	80.0	55.7		10	71.7	63.3	1.36
11	68.6	33.0		11	74.7	53.9		11	74.8	65.5	
12	78.7	47.4		12	60.7	48.2	0.19	12	82.7	68.2	
13	74.9	47.0	0.12	13	77.8	50.4	0.42	13	79.7	58.2	
14	48.0	40.6	0.74	14	88.3	57.1	0.01	14	79.7	56.3	
15	44.9	29.8	0.43	15	72.5	52.4		15	89.7	63.2	
16	33.8	26.8	0.02	16	81.2	50.7		16	92.6	69.4	
17	43.5	28.5		17	83.5	54.1		17	92.2	71.8	
18	40.9	29.1	0.01	18	75.7	57.8	0.03	18	93.1	73.0	
19	53.9	32.2		19	81.1	59.7	0.04	19	90.5	69.7	0.19
20	62.2	31.0		20	67.8	51.2		20	84.5	65.8	1.49
21	59.6	40.2		21	79.1	53.2	0.13	21	78.4	64.1	1.46
22	68.0	42.1		22	76.8	56.6		22	67.0	61.6	0.05
23	70.7	43.2	0.11	23	83.6	51.9		23	71.9	61.6	0.01
24	68.2	45.9		24	88.5	59.9		24	84.5	61.4	
25	60.5	33.5		25	90.3	59.5	0.04	25	81.3	61.7	
26	67.2	30.1		26	91.0	66.5		26	82.8	66.9	0.15
27	68.4	39.1		27	98.9	65.6		27	82.1	66.3	
28	56.5	28.7		28	96.5	67.9		28	85.9	62.2	
29	64.2	26.5		29	89.5	67.4		29	91.2	68.3	
30	78.4	29.4		30	86.4	67.8	0.36	30	91.2	71.0	
				31	91.4	66.2	0.03				

TEMPERATURE AND PRECIPITATION DATA

Momence

Recorded at
Stelle, Illinois Climate Network Station
Stelle, Illinois
2018

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	90.9	71.3	0.15	1	85.2	53.5		1	87.2	68.3	
2	86.7	66.1		2	86.9	58.4		2	91.4	70.4	
3	90.7	65.9		3	90.5	57.1		3	92.5	69.1	0.10
4	90.2	71.5	0.12	4	93.0	64.6		4	93.8	68.1	
5	89.9	71.1	0.03	5	93.7	65.9		5	93.4	66.6	0.30
6	77.5	59.4		6	89.8	69.9	0.01	6	73.6	66.8	0.30
7	80.2	58.0		7	80.2	68.1	0.04	7	69.1	61.8	0.82
8	83.2	56.5		8	84.8	62.7		8	66.9	58.5	0.01
9	88.8	58.7		9	91.4	58.4		9	71.6	56.6	
10	89.4	65.5		10	90.6	65.7	0.01	10	78.3	52.0	
11	86.6	62.2		11	89.9	63.2		11	82.1	50.3	
12	85.7	62.0		12	91.0	58.8		12	83.2	52.8	
13	88.8	60.6		13	88.7	56.4		13	84.9	53.7	
14	84.8	67.9	0.35	14	87.9	57.8		14	90.4	58.8	
15	87.1	69.1	0.02	15	83.8	68.1		15	86.7	61.4	
16	88.6	69.6		16	87.7	67.0	0.39	16	92.5	64.7	
17	85.9	62.7		17	84.1	65.1	0.31	17	93.3	61.2	
18	79.9	56.9		18	85.0	64.4		18	89.9	63.0	
19	85.4	60.0		19	86.4	61.2		19	91.2	63.5	
20	78.2	67.6	0.10	20	84.4	66.4	0.29	20	96.4	67.2	
21	80.1	67.5	0.19	21	77.4	63.1	0.02	21	81.4	56.2	0.06
22	79.6	64.5	0.05	22	79.6	55.7		22	68.5	49.6	
23	83.8	61.5		23	80.4	49.6		23	78.3	47.4	
24	86.9	61.6		24	73.0	56.2	0.26	24	74.0	53.7	0.01
25	85.1	62.0		25	87.4	64.0	0.01	25	85.7	62.3	0.58
26	82.1	60.4		26	93.5	70.6		26	69.5	43.8	
27	78.2	52.7		27	93.3	72.1		27	70.6	41.0	
28	78.8	51.3		28	94.0	68.7	0.17	28	70.9	45.7	
29	72.6	54.0		29	75.6	64.4	0.73	29	59.4	39.3	
30	79.4	53.8		30	78.4	58.5		30	83.0	52.1	0.03
31	75.1	57.7	0.03	31	85.9	56.1	0.01				

Project Code: 120-18-1

Location:
Hart, MI

Personnel: Bernard H. Zandstra, Nicole Soldan

Crop: Asparagus Variety: Jersey Supreme

Planting Method: Crowns Planting Date: 2011

Harvest Date: 5/12 - 6/15

Spacing: 1 ft Row Spacing: 4.5 ft

Tillage Type: Conventional Study Design: RCB

Replications: 3

Plot Size: 4.5 ft wide x 50 ft long

Soil Type: Spinks loamy fine sand

OM: 1%

pH: 5.2

Sand: 86%

Silt: 8%

Clay: 6%

CEC: 4

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	5/7/18	11:00am	60/55	F	Dry	1-2 NW	23	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/7	ASPA = Asparagus	1-2"	Preemergence	Good
5/7	HAVE = Hairy Vetch	1-2"	Veg	Few
5/7	SFGE = Smallflower Geranium	1-2"	Veg	Few
5/7	YEHW = Yellow Hawkweed	2-3"	Rosette	Few
	LACG = Large Crabgrass			
	COLQ = Common Lambsquarters			
	FISB = Field Sandbur			
	HOWE = Horseweed			
	POAM = Powell Amaranth			
	RUTH = Russian Thistle			

Notes and Comments

1. Spray applied with 4 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
 2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
 3. Same plots as 2013, 2014, 2015, 2016, and 2017.
 4. There are 2 guards on each side of the plot.
 5. 26 harvests from 5/12/18 - 6/15/18.
-

Michigan State University

Weed Control in Asparagus - Hart - 2018

Trial ID: 120-18-1
Protocol ID: 120-18-1

Location: Hart, MI Trial Year: 2018
Investigator: Dr. Bernard Zandstra

Pest Code				FISB	COLQ	POAM	RUTH	SFGE			
Crop Code				ASPA							
Rating Date				08Jun18	08Jun18	08Jun18	08Jun18	08Jun18			
Rating Type				RATING	RATING	RATING	RATING	RATING			
Rating Unit				1-10	1-10	1-10	1-10	1-10			
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage						
1	Sinbar	80	WDG	1 lb ai/a	PRE	1.0	10.0	10.0	8.7	10.0	10.0
2	Karmex	80	DF	1.6 lb ai/a	PRE	1.0	10.0	10.0	8.3	10.0	10.0
	Sencor	75	DF	1.6 lb ai/a	PRE						
3	Alion 200	1.67	SC	0.085 lb ai/a	PRE	1.0	10.0	10.0	10.0	10.0	10.0
4	Command	3	ME	2 lb ai/a	PRE	1.0	10.0	9.7	9.3	10.0	10.0
5	Matrix	25	DF	0.063 lb ai/a	PRE	1.0	10.0	9.0	9.7	9.7	10.0
6	Trellis	75	DF	1.5 lb ai/a	PRE	1.0	9.0	6.7	8.0	2.3	10.0
	Dual Magnum	7.62	EC	1.9 lb ai/a	PRE						
7	Zidua	85	WDG	0.267 lb ai/a	PRE	1.0	10.0	7.3	10.0	10.0	7.3
8	BIR	1.67	SL	0.045 lb ai/a	PRE	1.0	7.0	3.3	5.0	7.0	3.3
9	Callisto	4	SC	0.241 lb ai/a	PRE	1.0	6.7	10.0	8.7	10.0	9.0
	Prowl H2O	3.8	CS	1.9 lb ai/a	PRE						
10	Untreated					1.0	1.0	1.0	2.0	4.0	9.7
LSD P=.05						0.00	2.16	1.40	2.10	3.64	1.55
Standard Deviation						0.00	1.26	0.82	1.22	2.12	0.90
CV						0.0	15.07	10.63	15.34	25.55	10.13

Pest Code				FISB	LACG	COLQ	HOWE	POAM			
Crop Code				ASPA							
Rating Date				07Sep18	07Sep18	07Sep18	07Sep18	07Sep18			
Rating Type				RATING	RATING	RATING	RATING	RATING			
Rating Unit				1-10	1-10	1-10	1-10	1-10			
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage						
1	Sinbar	80	WDG	1 lb ai/a	PRE	1.7	8.3	4.7	10.0	10.0	8.0
2	Karmex	80	DF	1.6 lb ai/a	PRE	1.0	9.3	7.0	10.0	10.0	5.0
	Sencor	75	DF	1.6 lb ai/a	PRE						
3	Alion 200	1.67	SC	0.085 lb ai/a	PRE	2.0	10.0	10.0	10.0	10.0	10.0
4	Command	3	ME	2 lb ai/a	PRE	1.3	10.0	10.0	9.0	8.7	7.7
5	Matrix	25	DF	0.063 lb ai/a	PRE	1.0	8.7	10.0	5.7	9.3	9.3
6	Trellis	75	DF	1.5 lb ai/a	PRE	1.0	1.3	6.3	7.7	10.0	3.3
	Dual Magnum	7.62	EC	1.9 lb ai/a	PRE						
7	Zidua	85	WDG	0.267 lb ai/a	PRE	1.3	10.0	10.0	1.0	9.3	10.0
8	BIR	1.67	SL	0.045 lb ai/a	PRE	2.0	1.0	9.3	2.3	10.0	9.3
9	Callisto	4	SC	0.241 lb ai/a	PRE	1.0	1.0	9.3	7.0	10.0	4.3
	Prowl H2O	3.8	CS	1.9 lb ai/a	PRE						
10	Untreated					1.7	4.7	9.0	1.0	10.0	7.0
LSD P=.05						1.15	2.63	3.89	4.18	1.19	3.77
Standard Deviation						0.67	1.53	2.27	2.44	0.70	2.20
CV						47.82	23.82	26.48	38.25	7.16	29.73

Pest Code						RUTH					
Crop Code											
Rating Date						07Sep18	ASPA	ASPA	ASPA	ASPA	ASPA
Rating Type						RATING	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL
Rating Unit						1-10	KG/PLOT	KG/PLOT	KG/PLOT	KG/PLOT	KG/PLOT
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Unit Stage						
1	Sinbar	80	WDG	1 lb ai/a	PRE	10.0	3.71	6.21	7.10	6.20	7.74
2	Karmex	80	DF	1.6 lb ai/a	PRE	9.7	3.76	7.42	8.73	7.61	9.29
	Sencor	75	DF	1.6 lb ai/a	PRE						
3	Alion 200	1.67	SC	0.085 lb ai/a	PRE	10.0	3.94	8.15	8.54	8.10	9.70
4	Command	3	ME	2 lb ai/a	PRE	8.3	3.59	7.49	8.89	7.75	8.61
5	Matrix	25	DF	0.063 lb ai/a	PRE	2.3	3.32	7.92	8.63	7.77	8.89
6	Trellis	75	DF	1.5 lb ai/a	PRE	1.0	3.33	6.75	8.21	7.40	8.14
	Dual Magnum	7.62	EC	1.9 lb ai/a	PRE						
7	Zidua	85	WDG	0.267 lb ai/a	PRE	7.0	3.46	7.76	8.25	7.40	7.62
8	BIR	1.67	SL	0.045 lb ai/a	PRE	7.0	3.37	6.77	6.95	5.82	6.11
9	Callisto	4	SC	0.241 lb ai/a	PRE	1.7	3.42	7.16	6.99	6.32	7.14
	Prowl H20	3.8	CS	1.9 lb ai/a	PRE						
10	Untreated					4.0	4.07	7.36	7.92	6.60	7.30
	LSD P=.05					5.43	0.90	1.31	1.90	1.53	1.70
	Standard Deviation					3.17	0.52	0.76	1.11	0.89	0.99
	CV					51.91	14.53	10.47	13.81	12.57	12.31

Pest Code						ASPA	
Crop Code						ASPA	
Rating Date						2018	2013-2018
Rating Type						TOTAL	AVERAGE
Rating Unit						KG/PLOT	KG/PLOT
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Unit Stage		
1	Sinbar	80	WDG	1 lb ai/a	PRE	6.63	6.27
2	Karmex	80	DF	1.6 lb ai/a	PRE	8.17	7.50
	Sencor	75	DF	1.6 lb ai/a	PRE		
3	Alion 200	1.67	SC	0.085 lb ai/a	PRE	8.17	7.77
4	Command	3	ME	2 lb ai/a	PRE	7.74	7.34
5	Matrix	25	DF	0.063 lb ai/a	PRE	8.26	7.47
6	Trellis	75	DF	1.5 lb ai/a	PRE	7.12	6.82
	Dual Magnum	7.62	EC	1.9 lb ai/a	PRE		
7	Zidua	85	WDG	0.267 lb ai/a	PRE	6.39	6.81
8	BIR	1.67	SL	0.045 lb ai/a	PRE	6.03	5.84
9	Callisto	4	SC	0.241 lb ai/a	PRE	6.19	6.20
	Prowl H20	3.8	CS	1.9 lb ai/a	PRE		
10	Untreated					6.38	6.61
	LSD P=.05					1.51	1.26
	Standard Deviation					0.88	0.74
	CV					12.37	10.74

Fall Weed Control in Asparagus - HTRC - 2018

Project Code: 120-18-1

Location: East Lansing, MI
Block 115-116

Personnel: Bernard H. Zandstra, Nicole Soldan

Crop: Asparagus Variety: Millennium

Planting Method: Transplant Planting Date: 2009

Harvest Date: 5/7-6/15

Spacing: 1 ft Row Spacing: 6 ft

Tillage Type: Conventional Study Design: RCB

Replications: 3

Plot Size: 5.3 ft wide x 50 ft long

Soil Type: Capac Loam

OM: 2.1%

pH: 5.6

Sand: 58% Silt: 26%

Clay: 16%

CEC: 5.9

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
FALL	11/20/17	11:10 AM	52/45	F	Moist	1-3 N	95	100% Cloudy	N
EPRE	4/9/18	2:40 PM	40/38	F	Moist	1-2 NE	74	95% Cloudy	N
PRE	4/24/18	11:50 AM	59/50	F	Moist	6-8 NE	67	100% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
11/20/17	Asparagus	Mowed down	Dormant	
11/20/17	BRPL = Broadleaf Plantain	2-4"	Veg	Moderate
11/20/17	DAND = Dandelion	4-6"	Veg	Moderate
11/20/17	WICA = Wild Carrot	4-6"	Veg	Many
11/20/17	WIRA = Wild Radish	1-6"	Veg	Many
4/9/18	Asparagus		Dormant	
4/9/18	No weeds			
4/24/18	Asparagus		Dormant	
4/24/18	QUGR = Quackgrass	2-3"	Veg	Few
4/24/18	BHPL = Buckhorn Plantain	1-2"	Veg	Few
4/24/18	CATH = Canada Thistle	1-2"	Veg	Few
4/24/18	COCW = Common Chickweed	0-1"	Veg	Few
4/24/18	DAND = Dandelion	1-2"	Veg	Few
4/24/18	MECR = Mouseear Cress	1-2"	Flower	Moderate
4/24/18	PEST = Perennial Sowthistle	1-2"	Veg	Few
4/24/18	WICA = Wild Carrot	1-2"	Veg	Few
	DOBG = downy brome grass			
	YEFT = Yellow Foxtail			
	COLQ = Common Lambsquarters			
	COMW = Common Milkweed			
	FAPA = Fall Panicum			
	HOWE = Horseweed			
	RRPW = Redroot Pigweed			

Notes and Comments

1. Spray applied with 4 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
3. 22 harvests from 5/7/18 to 6/15/18

Fall Weed Control in Asparagus - HTRC - 2018

Michigan State University

Fall Weed Control in Asparagus - HTRC - 2018

Trial ID: 120-18-2 Location: HTRC Trial Year: 2018
 Protocol ID: 120-18-2 Investigator: Dr. Bernard Zandstra

Pest Code	Crop Code	Rating Date	Rating Type	Rating Unit								
					DOGR	QUGR	BRPL	CATH	COMW			
					ASPA							
					28May18	28May18	28May18	28May18	28May18	28May18		
					RATING	RATING	RATING	RATING	RATING	RATING		
					1-10	1-10	1-10	1-10	1-10	1-10		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage						
1	Alion 200	1.67	SC	0.046	lb ai/a	FALL	2.0	10.0	9.7	10.0	10.0	9.3
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
2	Alion 200	1.67	SC	0.065	lb ai/a	FALL	1.3	10.0	9.7	10.0	7.0	9.3
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
3	Alion 200	1.67	SC	0.085	lb ai/a	FALL	2.0	10.0	10.0	10.0	7.7	10.0
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
4	Alion 200	1.67	SC	0.13	lb ai/a	FALL	1.3	10.0	10.0	10.0	10.0	10.0
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
5	Chateau SW	51	WDG	0.192	lb ai/a	FALL	1.0	10.0	9.0	10.0	10.0	9.0
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
6	Karmex	80	DF	3	lb ai/a	FALL	1.0	9.0	10.0	10.0	10.0	9.7
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
7	Tricor	75	DF	1	lb ai/a	FALL	1.0	8.3	10.0	9.0	7.0	6.7
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
8	Solicam	80	DF	4	lb ai/a	FALL	1.0	10.0	10.0	10.0	10.0	9.3
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
9	Sinbar	80	WDG	1	lb ai/a	FALL	1.3	8.7	10.0	10.0	7.7	7.0
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
10	Command	3	ME	1	lb ai/a	FALL	2.0	10.0	10.0	10.0	10.0	9.3
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
11	Spartan	4	F	0.375	lb ai/a	FALL	2.0	9.0	9.0	10.0	10.0	8.3
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
12	Roundup PowerMax	5.5	L	1	lb ai/a	FALL	1.0	8.3	7.3	10.0	10.0	9.7
13	Chateau SW	51	WDG	0.192	lb ai/a	PRE	1.0	10.0	10.0	10.0	10.0	9.3
	Gramoxone SL	2	SL	1	lb ai/a	PRE						
14	Karmex	80	DF	3	lb ai/a	PRE	1.0	9.3	9.7	10.0	7.0	6.3
	Prowl H20	3.8	CS	3	lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1	lb ai/a	PRE						
15	Handweeded						1.3	8.0	10.0	7.3	7.0	1.7
16	Alion 200	1.67	SC	0.065	lb ai/a	PRE	1.0	10.0	10.0	10.0	8.7	6.3
	Roundup PowerMax	5.5	L	1	lb ai/a	PRE						
17	Alion 200	1.67	SC	0.026	lb ai/a	EPRE	1.7	9.7	10.0	10.0	10.0	8.3
	Roundup PowerMax	5.5	L	1	lb ai/a	EPRE						
18	Alion 200	1.67	SC	0.046	lb ai/a	EPRE	1.0	10.0	10.0	10.0	7.0	6.3
	Roundup PowerMax	5.5	L	1	lb ai/a	EPRE						
19	Alion 200	1.67	SC	0.065	lb ai/a	EPRE	1.7	10.0	10.0	10.0	10.0	7.3
	Roundup PowerMax	5.5	L	1	lb ai/a	EPRE						
LSD P=.05							0.86	1.53	1.98	1.88	4.65	4.25
Standard Deviation							0.52	0.93	1.20	1.14	2.82	2.58
CV							38.53	9.77	12.39	11.64	31.68	31.95

Fall Weed Control in Asparagus - HTRC - 2018

Pest Code				DAND	PEST	WICA	ASPA		YEFT	CATH		
Crop Code				28May18	28May18	28May18	03Jun18	03Jun18	03Jun18	03Jun18		
Rating Date				RATING	RATING	RATING	RATING	RATING	RATING	RATING		
Rating Type				1-10	1-10	1-10	1-10	1-10	1-10	1-10		
Rating Unit												
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Growth Unit	Stage						
1	Alion 200	1.67	SC	0.046	lb ai/a	FALL	10.0	10.0	6.7	1.3	10.0	10.0
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
2	Alion 200	1.67	SC	0.065	lb ai/a	FALL	7.7	7.0	9.0	1.7	10.0	7.0
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
3	Alion 200	1.67	SC	0.085	lb ai/a	FALL	7.7	6.3	9.7	1.3	10.0	8.3
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
4	Alion 200	1.67	SC	0.13	lb ai/a	FALL	10.0	10.0	9.7	1.7	10.0	10.0
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
5	Chateau SW	51	WDG	0.192	lb ai/a	FALL	9.3	9.3	8.0	1.0	9.7	10.0
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
6	Karmex	80	DF	3	lb ai/a	FALL	9.0	10.0	8.7	1.3	8.3	10.0
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
7	Tricor	75	DF	1	lb ai/a	FALL	10.0	9.0	10.0	1.3	3.0	7.0
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
8	Solicam	80	DF	4	lb ai/a	FALL	10.0	5.7	8.7	1.3	10.0	10.0
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
9	Sinbar	80	WDG	1	lb ai/a	FALL	10.0	7.0	9.3	1.3	4.3	7.7
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
10	Command	3	ME	1	lb ai/a	FALL	10.0	10.0	4.0	1.7	10.0	10.0
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
11	Spartan	4	F	0.375	lb ai/a	FALL	10.0	5.7	5.3	1.0	3.3	10.0
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
12	Roundup PowerMax	5.5	L	1	lb ai/a	FALL	9.0	5.0	6.7	1.0	3.3	10.0
13	Chateau SW	51	WDG	0.192	lb ai/a	PRE	9.7	10.0	9.3	1.0	10.0	10.0
	Gramoxone SL	2	SL	1	lb ai/a	PRE						
14	Karmex	80	DF	3	lb ai/a	PRE	10.0	9.3	5.0	1.3	10.0	7.0
	Prowl H2O	3.8	CS	3	lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1	lb ai/a	PRE						
15	Handweeded						9.0	1.7	9.0	2.0	4.3	7.0
16	Alion 200	1.67	SC	0.065	lb ai/a	PRE	10.0	10.0	5.7	1.7	10.0	8.7
	Roundup PowerMax	5.5	L	1	lb ai/a	PRE						
17	Alion 200	1.67	SC	0.026	lb ai/a	EPRE	10.0	9.0	5.3	1.7	10.0	10.0
	Roundup PowerMax	5.5	L	1	lb ai/a	EPRE						
18	Alion 200	1.67	SC	0.046	lb ai/a	EPRE	9.7	10.0	7.7	1.3	10.0	7.0
	Roundup PowerMax	5.5	L	1	lb ai/a	EPRE						
19	Alion 200	1.67	SC	0.065	lb ai/a	EPRE	10.0	10.0	7.3	2.0	10.0	10.0
	Roundup PowerMax	5.5	L	1	lb ai/a	EPRE						
LSD P=.05							2.45	4.53	3.81	0.98	2.75	4.56
Standard Deviation							1.48	2.74	2.31	0.60	1.67	2.76
CV							15.57	33.64	30.22	41.91	20.25	30.96

Fall Weed Control in Asparagus - HTRC - 2018

					COLQ	COMW	HOWE	PEST	WICA	WIRA	
					03Jun18	03Jun18	03Jun18	03Jun18	03Jun18	03Jun18	
					RATING	RATING	RATING	RATING	RATING	RATING	
					1-10	1-10	1-10	1-10	1-10	1-10	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Growth Stage						
1	Alion 200	1.67	SC	0.046 lb ai/a	FALL	10.0	8.3	9.7	8.7	7.3	
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL						
2	Alion 200	1.67	SC	0.065 lb ai/a	FALL	10.0	9.3	10.0	7.0	8.7	
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL						
3	Alion 200	1.67	SC	0.085 lb ai/a	FALL	10.0	10.0	10.0	6.3	10.0	
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL						
4	Alion 200	1.67	SC	0.13 lb ai/a	FALL	10.0	9.7	10.0	10.0	9.7	
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL						
5	Chateau SW	51	WDG	0.192 lb ai/a	FALL	10.0	9.0	10.0	9.3	7.7	
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL						
6	Karmex	80	DF	3 lb ai/a	FALL	10.0	9.3	10.0	10.0	7.7	
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL						
7	Tricor	75	DF	1 lb ai/a	FALL	6.0	9.3	10.0	8.0	9.3	
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL						
8	Solicam	80	DF	4 lb ai/a	FALL	10.0	9.0	10.0	6.0	7.7	
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL						
9	Sinbar	80	WDG	1 lb ai/a	FALL	8.3	7.0	10.0	7.0	9.3	
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL						
10	Command	3	ME	1 lb ai/a	FALL	10.0	9.0	10.0	10.0	4.0	
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL						
11	Spartan	4	F	0.375 lb ai/a	FALL	10.0	7.7	10.0	7.0	4.3	
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL						
12	Roundup PowerMax	5.5	L	1 lb ai/a	FALL	1.3	10.0	9.3	3.3	5.0	
13	Chateau SW	51	WDG	0.192 lb ai/a	PRE	10.0	9.0	10.0	10.0	9.3	
	Gramoxone SL	2	SL	1 lb ai/a	PRE						
14	Karmex	80	DF	3 lb ai/a	PRE	10.0	6.7	10.0	10.0	7.0	
	Prowl H2O	3.8	CS	3 lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
15	Handweeded					7.0	3.7	1.7	1.7	9.3	
16	Alion 200	1.67	SC	0.065 lb ai/a	PRE	10.0	7.3	10.0	10.0	4.0	
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
17	Alion 200	1.67	SC	0.026 lb ai/a	EPRE	9.3	7.0	10.0	8.7	3.7	
	Roundup PowerMax	5.5	L	1 lb ai/a	EPRE						
18	Alion 200	1.67	SC	0.046 lb ai/a	EPRE	9.3	5.7	10.0	10.0	7.3	
	Roundup PowerMax	5.5	L	1 lb ai/a	EPRE						
19	Alion 200	1.67	SC	0.065 lb ai/a	EPRE	9.7	7.7	10.0	10.0	7.7	
	Roundup PowerMax	5.5	L	1 lb ai/a	EPRE						
LSD P=.05						2.70	4.32	0.67	4.23	3.79	3.01
Standard Deviation						1.64	2.62	0.41	2.56	2.30	1.82
CV						18.19	32.18	4.28	31.84	31.41	19.44

Fall Weed Control in Asparagus - HTRC - 2018

Pest Code					QUGR	YEFT	CATH	COLQ	PEST			
Crop Code					ASPA							
Rating Date					15Jun18	15Jun18	15Jun18	15Jun18	15Jun18			
Rating Type					RATING	RATING	RATING	RATING	RATING			
Rating Unit					1-10	1-10	1-10	1-10	1-10			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Growth Unit	Stage						
1	Alion 200	1.67	SC	0.046	lb ai/a	FALL	1.7	9.7	10.0	10.0	10.0	8.0
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
2	Alion 200	1.67	SC	0.065	lb ai/a	FALL	1.0	9.3	10.0	7.0	9.7	7.7
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
3	Alion 200	1.67	SC	0.085	lb ai/a	FALL	1.0	10.0	10.0	7.3	10.0	6.0
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
4	Alion 200	1.67	SC	0.13	lb ai/a	FALL	1.3	10.0	10.0	10.0	10.0	9.7
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
5	Chateau SW	51	WDG	0.192	lb ai/a	FALL	1.3	7.7	10.0	9.7	10.0	9.0
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
6	Karmex	80	DF	3	lb ai/a	FALL	1.7	10.0	6.7	10.0	7.7	10.0
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
7	Tricor	75	DF	1	lb ai/a	FALL	1.0	10.0	6.3	7.0	4.0	9.3
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
8	Solicam	80	DF	4	lb ai/a	FALL	1.0	10.0	10.0	10.0	9.0	4.3
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
9	Sinbar	80	WDG	1	lb ai/a	FALL	1.0	10.0	2.3	10.0	7.7	7.0
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
10	Command	3	ME	1	lb ai/a	FALL	1.7	10.0	10.0	10.0	10.0	10.0
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
11	Spartan	4	F	0.375	lb ai/a	FALL	1.0	7.0	4.7	10.0	10.0	7.7
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL						
12	Roundup PowerMax	5.5	L	1	lb ai/a	FALL	1.0	7.0	4.7	10.0	7.0	4.0
13	Chateau SW	51	WDG	0.192	lb ai/a	PRE	1.0	10.0	10.0	9.0	10.0	10.0
	Gramoxone SL	2	SL	1	lb ai/a	PRE						
14	Karmex	80	DF	3	lb ai/a	PRE	1.0	9.3	10.0	7.0	10.0	10.0
	Prowl H2O	3.8	CS	3	lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1	lb ai/a	PRE						
15	Handweeded						1.3	10.0	10.0	7.0	7.0	2.0
16	Alion 200	1.67	SC	0.065	lb ai/a	PRE	1.3	10.0	7.7	7.7	10.0	10.0
	Roundup PowerMax	5.5	L	1	lb ai/a	PRE						
17	Alion 200	1.67	SC	0.026	lb ai/a	EPRE	1.3	10.0	10.0	10.0	8.3	8.3
	Roundup PowerMax	5.5	L	1	lb ai/a	EPRE						
18	Alion 200	1.67	SC	0.046	lb ai/a	EPRE	1.0	10.0	10.0	7.0	9.0	10.0
	Roundup PowerMax	5.5	L	1	lb ai/a	EPRE						
19	Alion 200	1.67	SC	0.065	lb ai/a	EPRE	1.7	10.0	10.0	10.0	9.3	10.0
	Roundup PowerMax	5.5	L	1	lb ai/a	EPRE						
LSD P=.05							0.64	3.20	3.55	4.44	3.90	3.89
Standard Deviation							0.39	1.94	2.15	2.69	2.36	2.35
CV							31.65	20.44	25.19	30.3	26.6	29.24

Fall Weed Control in Asparagus - HTRC - 2018

Pest Code					WICA	WIRA	ASPA	FAPA	CATH	COLQ	
Crop Code					15Jun18	15Jun18	18Jul18	18Jul18	18Jul18	18Jul18	
Rating Date					RATING	RATING	RATING	RATING	RATING	RATING	
Rating Type					1-10	1-10	1-10	1-10	1-10	1-10	
Rating Unit											
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage						
1	Alion 200	1.67	SC	0.046 lb ai/a	FALL	6.7	9.7	2.0	10.0	10.0	9.3
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL						
2	Alion 200	1.67	SC	0.065 lb ai/a	FALL	8.0	10.0	1.0	10.0	8.7	10.0
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL						
3	Alion 200	1.67	SC	0.085 lb ai/a	FALL	9.0	10.0	1.0	10.0	9.3	10.0
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL						
4	Alion 200	1.67	SC	0.13 lb ai/a	FALL	9.3	10.0	1.0	10.0	10.0	10.0
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL						
5	Chateau SW	51	WDG	0.192 lb ai/a	FALL	7.7	10.0	1.3	9.7	9.7	9.0
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL						
6	Karmex	80	DF	3 lb ai/a	FALL	6.3	9.7	1.0	9.0	10.0	9.3
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL						
7	Tricor	75	DF	1 lb ai/a	FALL	10.0	10.0	1.3	3.7	8.3	9.0
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL						
8	Solicam	80	DF	4 lb ai/a	FALL	6.0	10.0	1.0	10.0	10.0	9.0
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL						
9	Sinbar	80	WDG	1 lb ai/a	FALL	10.0	9.3	1.0	5.7	9.0	8.7
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL						
10	Command	3	ME	1 lb ai/a	FALL	2.7	7.0	2.0	9.7	10.0	10.0
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL						
11	Spartan	4	F	0.375 lb ai/a	FALL	1.7	7.0	1.3	3.0	10.0	10.0
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL						
12	Roundup PowerMax	5.5	L	1 lb ai/a	FALL	3.3	4.0	1.7	4.0	10.0	9.7
13	Chateau SW	51	WDG	0.192 lb ai/a	PRE	7.0	10.0	1.0	9.3	10.0	10.0
	Gramoxone SL	2	SL	1 lb ai/a	PRE						
14	Karmex	80	DF	3 lb ai/a	PRE	4.3	10.0	1.0	10.0	8.7	9.7
	Prowl H2O	3.8	CS	3 lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
15	Handweeded					7.7	10.0	1.3	7.3	7.3	9.3
16	Alion 200	1.67	SC	0.065 lb ai/a	PRE	1.7	9.3	1.3	10.0	8.7	9.3
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
17	Alion 200	1.67	SC	0.026 lb ai/a	EPRE	1.3	10.0	1.3	10.0	10.0	9.0
	Roundup PowerMax	5.5	L	1 lb ai/a	EPRE						
18	Alion 200	1.67	SC	0.046 lb ai/a	EPRE	3.3	10.0	1.0	9.3	8.0	9.7
	Roundup PowerMax	5.5	L	1 lb ai/a	EPRE						
19	Alion 200	1.67	SC	0.065 lb ai/a	EPRE	6.0	10.0	1.0	9.7	10.0	10.0
	Roundup PowerMax	5.5	L	1 lb ai/a	EPRE						
LSD P=.05						4.06	3.42	0.72	2.64	2.38	1.45
Standard Deviation						2.46	2.08	0.44	1.60	1.44	0.88
CV						41.75	22.41	35.27	18.93	15.44	9.22

Fall Weed Control in Asparagus - HTRC - 2018

Pest Code				PEST	RRPW	WICA	WIRA
Crop Code				18Jul18	18Jul18	18Jul18	18Jul18
Rating Date				RATING	RATING	RATING	RATING
Rating Type				1-10	1-10	1-10	1-10
Rating Unit							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate Unit	Growth Stage		
1	Alion 200	1.67	SC	0.046 lb ai/a	FALL	10.0	10.0
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL		
2	Alion 200	1.67	SC	0.065 lb ai/a	FALL	8.7	10.0
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL		
3	Alion 200	1.67	SC	0.085 lb ai/a	FALL	8.7	10.0
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL		
4	Alion 200	1.67	SC	0.13 lb ai/a	FALL	10.0	10.0
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL		
5	Chateau SW	51	WDG	0.192 lb ai/a	FALL	10.0	10.0
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL		
6	Karmex	80	DF	3 lb ai/a	FALL	10.0	10.0
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL		
7	Tricor	75	DF	1 lb ai/a	FALL	10.0	9.7
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL		
8	Solicam	80	DF	4 lb ai/a	FALL	8.3	10.0
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL		
9	Sinbar	80	WDG	1 lb ai/a	FALL	8.7	10.0
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL		
10	Command	3	ME	1 lb ai/a	FALL	10.0	10.0
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL		
11	Spartan	4	F	0.375 lb ai/a	FALL	9.7	10.0
	Roundup PowerMax	5.5	L	1 lb ai/a	FALL		
12	Roundup PowerMax	5.5	L	1 lb ai/a	FALL	7.0	10.0
13	Chateau SW	51	WDG	0.192 lb ai/a	PRE	10.0	10.0
	Gramoxone SL	2	SL	1 lb ai/a	PRE		
14	Karmex	80	DF	3 lb ai/a	PRE	10.0	10.0
	Prowl H2O	3.8	CS	3 lb ai/a	PRE		
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE		
15	Handweeded					6.7	10.0
16	Alion 200	1.67	SC	0.065 lb ai/a	PRE	9.3	10.0
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE		
17	Alion 200	1.67	SC	0.026 lb ai/a	EPRE	9.0	10.0
	Roundup PowerMax	5.5	L	1 lb ai/a	EPRE		
18	Alion 200	1.67	SC	0.046 lb ai/a	EPRE	9.0	10.0
	Roundup PowerMax	5.5	L	1 lb ai/a	EPRE		
19	Alion 200	1.67	SC	0.065 lb ai/a	EPRE	10.0	10.0
	Roundup PowerMax	5.5	L	1 lb ai/a	EPRE		
LSD P=.05						2.09	0.22
Standard Deviation						1.27	0.13
CV						13.75	1.33

Fall Weed Control in Asparagus - HTRC - 2018

Pest Code						ASPA	ASPA	ASPA	ASPA
Crop Code									
Rating Date									
Rating Type						TOTAL GOOD	TOTAL GOOD	TOTAL CULL	TOTAL CULL
Rating Unit						NO./PLOT	KG/PLOT	NO./PLOT	KG/PLOT
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Growth Unit Stage				
1	Alion 200	1.67	SC	0.046	lb ai/a FALL	456.0	9.83	23.0	0.48
	Roundup PowerMax	5.5	L	1	lb ai/a FALL				
2	Alion 200	1.67	SC	0.065	lb ai/a FALL	599.3	13.60	30.0	0.64
	Roundup PowerMax	5.5	L	1	lb ai/a FALL				
3	Alion 200	1.67	SC	0.085	lb ai/a FALL	569.0	12.74	43.0	0.93
	Roundup PowerMax	5.5	L	1	lb ai/a FALL				
4	Alion 200	1.67	SC	0.13	lb ai/a FALL	540.3	12.37	54.0	1.17
	Roundup PowerMax	5.5	L	1	lb ai/a FALL				
5	Chateau SW	51	WDG	0.192	lb ai/a FALL	519.7	12.28	37.7	0.82
	Roundup PowerMax	5.5	L	1	lb ai/a FALL				
6	Karmex	80	DF	3	lb ai/a FALL	496.7	11.36	30.0	0.67
	Roundup PowerMax	5.5	L	1	lb ai/a FALL				
7	Tricor	75	DF	1	lb ai/a FALL	494.3	12.11	20.3	0.44
	Roundup PowerMax	5.5	L	1	lb ai/a FALL				
8	Solicam	80	DF	4	lb ai/a FALL	557.3	13.13	37.7	0.79
	Roundup PowerMax	5.5	L	1	lb ai/a FALL				
9	Sinbar	80	WDG	1	lb ai/a FALL	534.0	12.33	27.0	0.59
	Roundup PowerMax	5.5	L	1	lb ai/a FALL				
10	Command	3	ME	1	lb ai/a FALL	458.7	10.28	23.0	0.47
	Roundup PowerMax	5.5	L	1	lb ai/a FALL				
11	Spartan	4	F	0.375	lb ai/a FALL	581.0	12.35	29.0	0.67
	Roundup PowerMax	5.5	L	1	lb ai/a FALL				
12	Roundup PowerMax	5.5	L	1	lb ai/a FALL	449.0	10.17	35.0	0.82
13	Chateau SW	51	WDG	0.192	lb ai/a PRE	551.3	12.65	61.0	1.52
	Gramoxone SL	2	SL	1	lb ai/a PRE				
14	Karmex	80	DF	3	lb ai/a PRE	600.7	13.06	24.7	0.49
	Prowl H2O	3.8	CS	3	lb ai/a PRE				
	Roundup PowerMax	5.5	L	1	lb ai/a PRE				
15	Handweeded					461.7	10.77	27.0	0.58
16	Alion 200	1.67	SC	0.065	lb ai/a PRE	542.7	11.50	37.7	0.74
	Roundup PowerMax	5.5	L	1	lb ai/a PRE				
17	Alion 200	1.67	SC	0.026	lb ai/a EPRE	487.0	10.95	28.3	0.63
	Roundup PowerMax	5.5	L	1	lb ai/a EPRE				
18	Alion 200	1.67	SC	0.046	lb ai/a EPRE	572.7	13.08	30.0	0.63
	Roundup PowerMax	5.5	L	1	lb ai/a EPRE				
19	Alion 200	1.67	SC	0.065	lb ai/a EPRE	482.0	11.54	21.0	0.50
	Roundup PowerMax	5.5	L	1	lb ai/a EPRE				
LSD P=.05						140.41	3.15	27.46	0.66
Standard Deviation						85.09	1.91	16.64	0.40
CV						16.24	16.06	51.06	56.21

Fall Weed Control in Asparagus - Malburg - 2018

Project Code: 120-18-3

Location: Hart, MI

Personnel: Bernard H. Zandstra, Nicole Soldan

Crop: Asparagus Variety: Millennium

Planting Method: Crowns Planting Date: 2011 Harvest Date: See notes

Spacing: 1 ft Row Spacing: 4.5 ft

Tillage Type: Conventional Study Design: RCB Replications: 3

Plot Size: 4.5 ft wide x 30 ft long

Soil Type: Spinks loamy fine sand OM: 1.4% pH: 5.7
 Sand: 85% Silt: 10% Clay: 5% CEC: 3.7

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
FALL	11/6/17	11:10 AM	39/41	F	Moist	3-5 N	64	97% Cloudy	N

Crop and Weed Information at Application

Date	Crop	Height or Diameter	Growth Stage	Density
11/6/17	Asparagus	Mowed down	Dormant	
11/6/17	MECW = Mouseear Chickweed	2-3"	Veg	Few
11/6/17	WICA = Wild Carrot	4-6"	Veg	Moderate
11/6/17	WHCA = White Champion	4-6"	Veg	Moderate
11/6/17	SFGE = Smallflower Geranium	3-5"	Veg	Moderate
	LACG = Large Crabgrass			
	FIPA = Field Pansy			
	POAM = Powell Amaranth			

Notes and Comments

1. Spray applied with 4 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
 2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
 3. Mow fern after a hard frost.
 4. Apply treatments to asparagus after mowing +/- November 1.
 5. 29 harvests between 5/12/18 to 6/18/18
-

Fall Weed Control in Asparagus - Malburg - 2018

Michigan State University

Fall Weed Control in Asparagus - Malburg - 2018

Trial ID: 120-18-3
Protocol ID: 120-18-3

Location: Hart, MI Trial Year: 2018
Investigator: Dr. Bernard Zandstra

Pest Code		FIPA		POAM	SFGE	WHCA
Crop Code		ASPA				
Rating Date		08Jun18	08Jun18	08Jun18	08Jun18	08Jun18
Rating Type		RATING	RATING	RATING	RATING	RATING
Rating Unit		1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Unit	Stage
1	Alion 200	1.67 SC		0.046 lb ai/a	FALL	
	Roundup PowerMax	5.5 L		1 lb ai/a	FALL	
2	Alion 200	1.67 SC		0.065 lb ai/a	FALL	
	Roundup PowerMax	5.5 L		1 lb ai/a	FALL	
3	Alion 200	1.67 SC		0.085 lb ai/a	FALL	
	Roundup PowerMax	5.5 L		1 lb ai/a	FALL	
4	Chateau SW	51 WDG		0.192 lb ai/a	FALL	
	Roundup PowerMax	5.5 L		1 lb ai/a	FALL	
5	Karmex	80 DF		3 lb ai/a	FALL	
	Roundup PowerMax	5.5 L		1 lb ai/a	FALL	
6	Solicam	80 DF		4 lb ai/a	FALL	
	Roundup PowerMax	5.5 L		1 lb ai/a	FALL	
7	Sinbar	80 WDG		1 lb ai/a	FALL	
	Roundup PowerMax	5.5 L		1 lb ai/a	FALL	
8	Command	3 ME		1 lb ai/a	FALL	
	Roundup PowerMax	5.5 L		1 lb ai/a	FALL	
9	Spartan	4 F		0.375 lb ai/a	FALL	
	Roundup PowerMax	5.5 L		1 lb ai/a	FALL	
10	Roundup PowerMax	5.5 L		1 lb ai/a	FALL	
	LSD P=.05			1.13	3.77	2.69
	Standard Deviation			0.66	2.20	1.57
	CV			47.02	32.63	30.4
						7.0
						7.7
						10.0
						10.0
						8.7
						9.3
						8.0
						9.0
						8.3
						9.3
						9.7
						10.0
						9.7
						7.0
						3.0
						1.7
						2.69
						3.78
						1.57
						2.21
						30.4
						24.59
						18.66

Fall Weed Control in Asparagus - Malburg - 2018

Pest Code				LACG		POAM		ASPA		
Crop Code				ASPA				ASPA		
Rating Date				07Sep18		07Sep18		07Sep18		
Rating Type				RATING		RATING		TOTAL		
Rating Unit				1-10		1-10		1-10 KG/PLOT		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Rate Unit	Growth Stage				
1	Alion 200	1.67	SC	0.046	lb ai/a	FALL	1.7	10.0	10.0	8.1223
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL				
2	Alion 200	1.67	SC	0.065	lb ai/a	FALL	1.0	10.0	10.0	7.4070
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL				
3	Alion 200	1.67	SC	0.085	lb ai/a	FALL	1.3	10.0	9.0	7.6723
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL				
4	Chateau SW	51	WDG	0.192	lb ai/a	FALL	1.1	8.7	1.7	7.8980
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL				
5	Karmex	80	DF	3	lb ai/a	FALL	1.3	9.0	2.0	8.1630
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL				
6	Solicam	80	DF	4	lb ai/a	FALL	1.7	10.0	1.3	7.4943
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL				
7	Sinbar	80	WDG	1	lb ai/a	FALL	1.0	10.0	3.0	7.9723
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL				
8	Command	3	ME	1	lb ai/a	FALL	1.0	10.0	3.3	7.9860
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL				
9	Spartan	4	F	0.375	lb ai/a	FALL	1.0	9.7	3.7	8.2017
	Roundup PowerMax	5.5	L	1	lb ai/a	FALL				
10	Roundup PowerMax	5.5	L	1	lb ai/a	FALL	1.3	9.0	1.7	7.4883
	LSD P=.05						0.92	1.87	3.14	1.17414
	Standard Deviation						0.53	1.09	1.83	0.68445
	CV						42.85	11.34	40.13	8.73

Weed Control in Basil - Van Drunen - 2018

Project Code: 117-18-1

Location: Momence, IL

Personnel: Bernard H. Zandstra, Nicole Soldan

Crop: Basil Variety: Obsession, Esmeralda, Plenty, Italian Longleaf

Planting Method: Seeded Planting Date: 5/23/18 Harvest Date: 8/8/18

Spacing: 1 inch Row Spacing: 10 inch; 1 row of each variety/plot

Tillage Type: Conventional Study Design: RCB Replications: 3

Plot Size: 5.5 ft wide x 30 ft long

Soil Type: Jasper loam

OM: 6.5%

pH: 5.6

Sand: 27% Silt: 36%

Clay: 37%

CEC: 22.5

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	5/24	11:45 AM	84/71	F	Dry	3-4 SE	29	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/24	Basil		Preemergence	
5/24	No Weeds			

LACG = Large Crabgrass
COPU = Common Purslane
RRPW = Redroot Pigweed

Notes and Comments

1. Spray applied with 4 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
 2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
-

Weed Control in Basil - Van Drunen - 2018

Michigan State University

Weed Control in Basil - Van Drunen - 2018

Trial ID: 117-18-1 Location: Momence, IL Trial Year: 2018
 Protocol ID: 117-18-1 Investigator: Dr. Bernard Zandstra

					LACG		COPU				
					BASIL	BASIL	BASIL	BASIL			
					OBSESION	ESMRLDA	PLENTY	ITALIAN			
					20Jun18	20Jun18	20Jun18	20Jun18	20Jun18	20Jun18	
					RATING	RATING	RATING	RATING	RATING	RATING	
					1-10	1-10	1-10	1-10	1-10	1-10	
Trt	Treatment	Form	Form	Rate	Growth						
No.	Name	Conc	Type	Rate	Unit	Stage					
1	Devrinol DF-XT	50	DF	1 lb ai/a	PRE	8.7	1.3	1.3	1.3	8.7	1.0
2	Lorox	50	DF	0.25 lb ai/a	PRE	4.0	1.0	1.0	1.0	1.7	3.3
3	Lorox	50	DF	0.5 lb ai/a	PRE	8.0	1.0	1.0	1.0	1.7	6.0
4	Kerb	3.3	SC	1 lb ai/a	PRE	7.3	3.3	3.0	3.3	2.0	8.7
5	Spartan	4	F	0.125 lb ai/a	PRE	7.0	1.3	1.0	1.0	2.7	8.7
6	Spartan	4	F	0.25 lb ai/a	PRE	9.7	2.7	2.7	3.0	5.0	9.0
7	Spartan	4	F	0.5 lb ai/a	PRE	10.0	8.0	7.3	7.3	9.7	10.0
8	Nortron	4	SC	1 lb ai/a	PRE	9.7	4.3	3.7	3.7	4.3	6.0
9	Ultra Blazer	2	L	0.375 lb ai/a	PRE	7.0	4.7	3.7	4.0	4.0	4.0
10	Untreated					5.3	1.0	1.0	1.0	3.0	1.0
LSD P=.05						3.36	4.39	3.21	4.16	3.25	3.61
Standard Deviation						1.96	2.56	1.87	2.42	1.89	2.11
CV						25.51	89.21	72.81	90.92	44.38	36.54

					RRPW	LACG					
						BASIL	BASIL	BASIL	BASIL		
						OBSESION	ESMRLDA	PLENTY	ITALIAN		
					20Jun18	07Jul18	07Jul18	07Jul18	07Jul18	07Jul18	07Jul18
					RATING	RATING	RATING	RATING	RATING	RATING	RATING
					1-10	1-10	1-10	1-10	1-10	1-10	1-10
Trt	Treatment	Form	Form	Rate	Growth						
No.	Name	Conc	Type	Rate	Unit	Stage					
1	Devrinol DF-XT	50	DF	1 lb ai/a	PRE	2.7	7.7	4.0	4.3	3.3	9.7
2	Lorox	50	DF	0.25 lb ai/a	PRE	5.3	6.0	1.7	1.7	1.0	4.3
3	Lorox	50	DF	0.5 lb ai/a	PRE	9.3	6.0	3.0	3.0	2.3	2.3
4	Kerb	3.3	SC	1 lb ai/a	PRE	3.0	5.7	3.7	3.3	4.0	2.0
5	Spartan	4	F	0.125 lb ai/a	PRE	10.0	5.0	1.7	1.3	1.0	5.0
6	Spartan	4	F	0.25 lb ai/a	PRE	9.0	7.7	1.3	1.3	2.0	8.3
7	Spartan	4	F	0.5 lb ai/a	PRE	9.7	10.0	6.7	6.7	7.0	10.0
8	Nortron	4	SC	1 lb ai/a	PRE	8.3	9.7	3.7	3.3	3.0	7.3
9	Ultra Blazer	2	L	0.375 lb ai/a	PRE	5.7	6.0	5.0	4.0	4.3	6.7
10	Untreated					1.0	5.7	4.7	5.3	5.0	1.0
LSD P=.05						3.92	3.32	3.97	3.37	4.44	4.14
Standard Deviation						2.28	1.93	2.31	1.96	2.59	2.41
CV						35.67	27.88	65.43	57.14	78.44	42.57

Weed Control in Basil - Van Drunen - 2018

Pest Code		COPU									
Crop Code		BASIL			BASIL		BASIL		BASIL		
Crop Name		OBSESION			ESMRLDA		PLENTY		ITALIAN		
Rating Date		07Jul18			08Aug18		08Aug18		08Aug18		
Rating Type		RATING			HARVST		HARVST		HARVST		
Rating Unit		1-10			KG/PLOT		KG/PLOT		KG/PLOT		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Grwth Stage						
1	Devrinol DF-XT	50 DF		1 lb ai/a	PRE	1.0	1.02	5.24	5.89	7.62	19.77
2	Lorox	50 DF		0.25 lb ai/a	PRE	5.0	1.41	7.66	7.46	11.93	28.46
3	Lorox	50 DF		0.5 lb ai/a	PRE	5.7	1.86	6.79	6.91	8.36	23.93
4	Kerb	3.3 SC		1 lb ai/a	PRE	8.7	2.47	7.07	6.96	6.61	23.12
5	Spartan	4 F		0.125 lb ai/a	PRE	8.7	3.78	11.27	10.65	10.11	35.81
6	Spartan	4 F		0.25 lb ai/a	PRE	9.3	2.27	9.71	12.65	8.64	33.27
7	Spartan	4 F		0.5 lb ai/a	PRE	10.0	0.00	4.27	5.16	4.00	13.43
8	Nortron	4 SC		1 lb ai/a	PRE	7.0	0.12	6.19	5.25	7.22	18.78
9	Ultra Blazer	2 L		0.375 lb ai/a	PRE	5.3	2.03	8.68	4.92	6.21	21.84
10	Untreated					1.0	1.08	3.31	2.33	3.68	10.40
	LSD P=.05					3.98	2.54	6.70	3.85	6.33	16.03
	Standard Deviation					2.32	1.48	3.91	2.24	3.69	9.35
	CV					37.62	92.42	55.66	32.87	49.57	40.85

Weed Control in Red Beet, Sugar Beet, and Swiss Chard - HTRC - 2018

Project Code: 109-18-1

Location: East Lansing, MI
Block 132

Personnel: Bernard H. Zandstra, Nicole Soldan

Crop: Red Beet, Swiss Chard, Sugar Beet Variety: Detroit Dark Red, Fordhook Giant, Crystal G515 RP (2018)

Planting Method: Seeded Planting Date: 4/25/18 Harvest Date: see notes

Spacing: 3 in Row Spacing: 14 in; 2 rows Red beet, 2 rows Sugar beet, 1 row Swiss chard

Tillage Type: Conventional Study Design: RCB Replications: 3

Plot Size: 5.3 ft wide x 30 ft long

Soil Type: Marlette fine sandy loam OM: 1.8% pH: 5.7
Sand: 65% Silt: 15% Clay: 20% CEC: 6.1

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PPI	4/25	2:05 PM	56/52	F	Moist	9-14 N	44	40% Cloudy	N
PRE	4/30	2:45 PM	77/58	F	Dry	10	12	0% Cloudy	N
PO1	6/1	10:45 AM	86/75	F	Damp	1-3 NW	41	75% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/25	Beets & Swiss Chard		Preemergence	
4/25	No weeds			
4/30	Beets & Swiss Chard		Preemergence	
4/30	No weeds			
6/1	Red Beet	2-4"	3-5 LS	Good
6/1	Sugar Beet	4-5"	3-4 LS	Good
6/1	Swiss Chard	3-4"	5-6 LS	Good
6/1	ANBG = Annual Bluegrass	5"	Veg	Few
6/1	BYGR = Barnyard Grass	1-7"	Veg	Moderate
6/1	COLQ = Common Lambsquarters	1-3"	Veg	Few
6/1	COPU = Common Purslane	1-2"	Veg	Many
6/1	LATH = Ladysthumb	1-3"	Veg	Few
6/1	WIRA = Wild Radish	3-6"	Veg	Few
	LACG = Large Crabgrass			
	YEFT = Yellow Foxtail			
	CORW = Common Ragweed			
	RRPW = Redroot Pigweed			

Notes and Comments

1. Spray applied with 4 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
3. Swiss Chard was harvested 8/1/18. Red beets were harvested 8/2/18. Sugar beets were harvested (10/9/18).

Weed Control in Red Beet, Sugar Beet, and Swiss Chard – HTRC – 2018

Michigan State University

Weed Control in Red Beet, Sugar Beet, and Swiss Chard - HTRC - 2018

Trial ID: 109-18-1
Protocol ID: 109-18-1

Location: East Lansing, MI
Investigator: Dr. Bernard Zandstra

Trial Year: 2018

Pest Code	Crop Code	Rating Date	Rating Type	Rating Unit	REBE			SWCH			SUBE		
					30May18	30May18	30May18	30May18	30May18	30May18	30May18	30May18	30May18
					RATING	RATING	RATING	RATING	RATING	RATING	RATING		
					1-10	1-10	1-10	1-10	1-10	1-10	1-10		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Unit	Growth Stage	BYGR	YEFT	COLQ				
1	Dual Magnum	7.62	EC	1.3 lb ai/a	PRE		1.7	2.3	2.0	10.0	10.0	9.7	
2	Pyramin	68	DF	2 lb ai/a	PRE		1.7	1.7	2.0	9.3	9.3	9.3	
3	Outlook	6	EC	0.4 lb ai/a	PRE		2.0	2.3	2.0	10.0	10.0	9.3	
4	Nortron	4	SC	1.5 lb ai/a	PRE		2.0	1.7	2.0	10.0	10.0	10.0	
5	Ro-Neet	6	EC	3 lb ai/a	PPI		2.3	2.0	2.3	9.7	9.0	9.3	
6	Dual Magnum	7.62	EC	1.0 lb ai/a	PRE		1.7	2.3	2.3	10.0	10.0	9.3	
	Betamix	1.3	EC	0.488 lb ai/a	PO1								
	Nortron	4	SC	0.33 lb ai/a	PO1								
	Stinger	3	L	0.188 lb ai/a	PO1								
	Select Max	.97	EC	0.12 lb ai/a	PO1								
7	Dual Magnum	7.62	EC	1.0 lb ai/a	PRE		1.7	2.0	2.3	10.0	10.0	10.0	
	Nortron	4	SC	0.33 lb ai/a	PO1								
	Spin-Aid	1.3	L	0.488 lb ai/a	PO1								
	Select Max	.97	EC	0.12 lb ai/a	PO1								
8	Dual Magnum	7.62	EC	1.0 lb ai/a	PRE		2.7	3.7	3.0	10.0	10.0	10.0	
	Stinger	3	L	0.188 lb ai/a	PO1								
	Spin-Aid	1.3	L	0.488 lb ai/a	PO1								
	Select Max	.97	EC	0.12 lb ai/a	PO1								
9	Dual Magnum	7.62	EC	1.0 lb ai/a	PRE		2.3	2.7	2.7	10.0	9.7	9.7	
	Nortron	4	SC	0.33 lb ai/a	PO1								
	Stinger	3	L	0.125 lb ai/a	PO1								
	Upbeet	50	WDG	0.0156 lb ai/a	PO1								
	Select Max	.97	EC	0.12 lb ai/a	PO1								
10	Untreated				PRE		1.0	1.0	1.0	1.0	1.0	1.0	
	Nortron	4	SC	0.33 lb ai/a	PO1								
	Betamix	1.3	EC	0.488 lb ai/a	PO1								
	Stinger	3	L	0.125 lb ai/a	PO1								
	Upbeet	50	WDG	0.0156 lb ai/a	PO1								
	Select Max	.97	EC	0.12 lb ai/a	PO1								
LSD P=.05							0.91	0.85	0.83	0.72	0.88	1.22	
Standard Deviation							0.53	0.49	0.48	0.42	0.51	0.71	
CV							27.92	22.82	22.29	4.64	5.76	8.13	

Weed Control in Red Beet, Sugar Beet, and Swiss Chard - HTRC - 2018

Pest Code						BYGR	LACG	YEFT	COLQ			
Crop Code						REBE	SWCH	SUBE				
Rating Date						10Jun18	10Jun18	10Jun18	10Jun18			
Rating Type						RATING	RATING	RATING	RATING			
Rating Unit						1-10	1-10	1-10	1-10			
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage							
1	Dual Magnum	7.62	EC	1.3 lb ai/a	PRE	2.3	2.0	1.7	10.0	9.7	10.0	9.0
2	Pyramin	68	DF	2 lb ai/a	PRE	2.0	2.0	1.7	7.7	7.3	8.7	8.7
3	Outlook	6	EC	0.4 lb ai/a	PRE	2.0	1.7	1.7	10.0	9.3	10.0	8.0
4	Nortron	4	SC	1.5 lb ai/a	PRE	2.3	2.0	2.0	8.7	9.7	9.7	9.3
5	Ro-Neet	6	EC	3 lb ai/a	PPI	1.7	1.3	1.0	8.3	9.3	9.0	7.7
6	Dual Magnum	7.62	EC	1.0 lb ai/a	PRE	2.0	2.0	1.7	10.0	10.0	10.0	10.0
	Betamix	1.3	EC	0.488 lb ai/a	PO1							
	Nortron	4	SC	0.33 lb ai/a	PO1							
	Stinger	3	L	0.188 lb ai/a	PO1							
	Select Max	.97	EC	0.12 lb ai/a	PO1							
7	Dual Magnum	7.62	EC	1.0 lb ai/a	PRE	2.0	1.7	1.7	10.0	10.0	10.0	10.0
	Nortron	4	SC	0.33 lb ai/a	PO1							
	Spin-Aid	1.3	L	0.488 lb ai/a	PO1							
	Select Max	.97	EC	0.12 lb ai/a	PO1							
8	Dual Magnum	7.62	EC	1.0 lb ai/a	PRE	2.3	2.3	1.7	10.0	10.0	10.0	10.0
	Stinger	3	L	0.188 lb ai/a	PO1							
	Spin-Aid	1.3	L	0.488 lb ai/a	PO1							
	Select Max	.97	EC	0.12 lb ai/a	PO1							
9	Dual Magnum	7.62	EC	1.0 lb ai/a	PRE	2.3	2.0	1.7	10.0	10.0	10.0	10.0
	Nortron	4	SC	0.33 lb ai/a	PO1							
	Stinger	3	L	0.125 lb ai/a	PO1							
	Upbeet	50	WDG	0.0156 lb ai/a	PO1							
	Select Max	.97	EC	0.12 lb ai/a	PO1							
10	Untreated				PRE	1.3	1.3	1.3	8.7	10.0	10.0	10.0
	Nortron	4	SC	0.33 lb ai/a	PO1							
	Betamix	1.3	EC	0.488 lb ai/a	PO1							
	Stinger	3	L	0.125 lb ai/a	PO1							
	Upbeet	50	WDG	0.0156 lb ai/a	PO1							
	Select Max	.97	EC	0.12 lb ai/a	PO1							
LSD P=.05						1.14	1.09	0.95	1.16	1.42	0.91	1.87
Standard Deviation						0.66	0.64	0.55	0.67	0.83	0.53	1.09
CV						32.65	34.66	34.65	7.23	8.66	5.45	11.75

Weed Control in Red Beet, Sugar Beet, and Swiss Chard – HTRC – 2018

Pest Code				LATH		RRPW		REBE		SWCH		SUBE		BYGR		COLQ		
Crop Code				10Jun18		10Jun18		26Jun18		26Jun18		26Jun18		26Jun18		26Jun18		
Rating Date				RATING		RATING		RATING		RATING		RATING		RATING		RATING		
Rating Type				1-10		1-10		1-10		1-10		1-10		1-10		1-10		
Rating Unit																		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage												
1	Dual Magnum	7.62	EC	1.3	lb ai/a	PRE	10.0	10.0	2.0	1.3	1.7	9.7	7.0					
2	Pyramin	68	DF	2	lb ai/a	PRE	9.3	9.3	1.7	1.7	2.0	3.3	7.0					
3	Outlook	6	EC	0.4	lb ai/a	PRE	8.3	10.0	2.0	2.0	2.0	9.3	6.3					
4	Nortron	4	SC	1.5	lb ai/a	PRE	10.0	9.7	2.3	2.0	2.0	7.0	8.0					
5	Ro-Neet	6	EC	3	lb ai/a	PPI	7.0	7.3	1.3	1.7	1.3	6.7	6.0					
6	Dual Magnum	7.62	EC	1.0	lb ai/a	PRE	10.0	10.0	1.7	1.7	1.3	10.0	10.0					
	Betamix	1.3	EC	0.488	lb ai/a	PO1												
	Nortron	4	SC	0.33	lb ai/a	PO1												
	Stinger	3	L	0.188	lb ai/a	PO1												
	Select Max	.97	EC	0.12	lb ai/a	PO1												
7	Dual Magnum	7.62	EC	1.0	lb ai/a	PRE	10.0	10.0	1.7	1.7	2.0	10.0	10.0					
	Nortron	4	SC	0.33	lb ai/a	PO1												
	Spin-Aid	1.3	L	0.488	lb ai/a	PO1												
	Select Max	.97	EC	0.12	lb ai/a	PO1												
8	Dual Magnum	7.62	EC	1.0	lb ai/a	PRE	10.0	10.0	1.3	1.7	1.7	10.0	10.0					
	Stinger	3	L	0.188	lb ai/a	PO1												
	Spin-Aid	1.3	L	0.488	lb ai/a	PO1												
	Select Max	.97	EC	0.12	lb ai/a	PO1												
9	Dual Magnum	7.62	EC	1.0	lb ai/a	PRE	10.0	10.0	2.0	2.0	1.7	10.0	9.7					
	Nortron	4	SC	0.33	lb ai/a	PO1												
	Stinger	3	L	0.125	lb ai/a	PO1												
	Upbeet	50	WDG	0.0156	lb ai/a	PO1												
	Select Max	.97	EC	0.12	lb ai/a	PO1												
10	Untreated					PRE	10.0	10.0	2.0	2.0	1.7	9.3	10.0					
	Nortron	4	SC	0.33	lb ai/a	PO1												
	Betamix	1.3	EC	0.488	lb ai/a	PO1												
	Stinger	3	L	0.125	lb ai/a	PO1												
	Upbeet	50	WDG	0.0156	lb ai/a	PO1												
	Select Max	.97	EC	0.12	lb ai/a	PO1												
LSD P=.05							1.58	1.14	1.10	0.92	0.95	2.37	3.57					
Standard Deviation							0.92	0.66	0.64	0.53	0.55	1.38	2.08					
CV							9.73	6.89	35.62	30.23	31.99	16.22	24.77					

Weed Control in Red Beet, Sugar Beet, and Swiss Chard - HTRC - 2018

Pest Code				CORW		WIRA					
Crop Code						REBE		REBE			
Rating Date				26Jun18		26Jun18		02Aug18			
Rating Type				RATING		RATING		COUNT			
Rating Unit				1-10		1-10		NO./PLOT			
Trt		Form Form		Rate		Growth					
No.	Treatment	Conc	Type	Rate	Unit	Stage					
1	Dual Magnum	7.62	EC	1.3	lb ai/a	PRE	6.0	10.0	226.7	15.760	9.233
2	Pyramin	68	DF	2	lb ai/a	PRE	10.0	9.7	262.3	12.160	9.587
3	Outlook	6	EC	0.4	lb ai/a	PRE	9.0	7.7	246.0	15.147	9.540
4	Nortron	4	SC	1.5	lb ai/a	PRE	9.3	4.7	238.7	15.770	10.240
5	Ro-Neet	6	EC	3	lb ai/a	PPI	10.0	7.0	229.0	19.147	11.433
6	Dual Magnum	7.62	EC	1.0	lb ai/a	PRE	10.0	10.0	274.7	18.973	9.347
	Betamix	1.3	EC	0.488	lb ai/a	PO1					
	Nortron	4	SC	0.33	lb ai/a	PO1					
	Stinger	3	L	0.188	lb ai/a	PO1					
	Select Max	.97	EC	0.12	lb ai/a	PO1					
7	Dual Magnum	7.62	EC	1.0	lb ai/a	PRE	10.0	10.0	258.3	16.587	10.080
	Nortron	4	SC	0.33	lb ai/a	PO1					
	Spin-Aid	1.3	L	0.488	lb ai/a	PO1					
	Select Max	.97	EC	0.12	lb ai/a	PO1					
8	Dual Magnum	7.62	EC	1.0	lb ai/a	PRE	10.0	7.0	258.0	18.433	10.820
	Stinger	3	L	0.188	lb ai/a	PO1					
	Spin-Aid	1.3	L	0.488	lb ai/a	PO1					
	Select Max	.97	EC	0.12	lb ai/a	PO1					
9	Dual Magnum	7.62	EC	1.0	lb ai/a	PRE	10.0	9.3	242.7	19.793	11.453
	Nortron	4	SC	0.33	lb ai/a	PO1					
	Stinger	3	L	0.125	lb ai/a	PO1					
	Upbeet	50	WDG	0.0156	lb ai/a	PO1					
	Select Max	.97	EC	0.12	lb ai/a	PO1					
10	Untreated					PRE	10.0	9.0	257.3	17.333	12.000
	Nortron	4	SC	0.33	lb ai/a	PO1					
	Betamix	1.3	EC	0.488	lb ai/a	PO1					
	Stinger	3	L	0.125	lb ai/a	PO1					
	Upbeet	50	WDG	0.0156	lb ai/a	PO1					
	Select Max	.97	EC	0.12	lb ai/a	PO1					
LSD P=.05							2.55	4.84	72.52	5.0005	3.6995
Standard Deviation							1.49	2.82	42.28	2.9149	2.1566
CV							15.76	33.47	16.95	17.24	20.79

Weed Control in Red Beet, Sugar Beet, and Swiss Chard – HTRC – 2018

Pest Code				SWCHARD		SUBE		SUBE	
Crop Code				01Aug18		09Oct18		09Oct18	
Rating Date				HARVEST		HARVEST		HARVEST	
Rating Type				KG/PLOT		NO./PLOT		KG/PLOT	
Rating Unit									
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage				
1	Dual Magnum	7.62	EC	1.3 lb ai/a	PRE	12.180	123.0	51.63	
2	Pyramin	68	DF	2 lb ai/a	PRE	13.340	115.3	36.39	
3	Outlook	6	EC	0.4 lb ai/a	PRE	14.893	126.7	44.08	
4	Nortron	4	SC	1.5 lb ai/a	PRE	15.827	132.3	48.38	
5	Ro-Neet	6	EC	3 lb ai/a	PPI	17.007	133.0	55.98	
6	Dual Magnum	7.62	EC	1.0 lb ai/a	PRE	12.993	132.0	55.33	
	Betamix	1.3	EC	0.488 lb ai/a	PO1				
	Nortron	4	SC	0.33 lb ai/a	PO1				
	Stinger	3	L	0.188 lb ai/a	PO1				
	Select Max	.97	EC	0.12 lb ai/a	PO1				
7	Dual Magnum	7.62	EC	1.0 lb ai/a	PRE	14.683	123.3	51.55	
	Nortron	4	SC	0.33 lb ai/a	PO1				
	Spin-Aid	1.3	L	0.488 lb ai/a	PO1				
	Select Max	.97	EC	0.12 lb ai/a	PO1				
8	Dual Magnum	7.62	EC	1.0 lb ai/a	PRE	19.603	126.3	58.98	
	Stinger	3	L	0.188 lb ai/a	PO1				
	Spin-Aid	1.3	L	0.488 lb ai/a	PO1				
	Select Max	.97	EC	0.12 lb ai/a	PO1				
9	Dual Magnum	7.62	EC	1.0 lb ai/a	PRE	16.967	130.7	62.87	
	Nortron	4	SC	0.33 lb ai/a	PO1				
	Stinger	3	L	0.125 lb ai/a	PO1				
	Upbeet	50	WDG	0.0156 lb ai/a	PO1				
	Select Max	.97	EC	0.12 lb ai/a	PO1				
10	Untreated				PRE	19.220	130.3	44.86	
	Nortron	4	SC	0.33 lb ai/a	PO1				
	Betamix	1.3	EC	0.488 lb ai/a	PO1				
	Stinger	3	L	0.125 lb ai/a	PO1				
	Upbeet	50	WDG	0.0156 lb ai/a	PO1				
	Select Max	.97	EC	0.12 lb ai/a	PO1				
LSD P=.05						6.0777	17.72	15.132	
Standard Deviation						3.5429	10.33	8.8213	
CV						22.61	8.11	17.29	

Weed Control in Broccoli and Cabbage - HTRC - 2018

Project Code: 114-18-1

Location: East Lansing, MI
Block 87

Personnel: Bernard H. Zandstra, Nicole Soldan

Crop: Broccoli, Cabbage Variety: Green Magic; Blue Vantage

Planting Method: Transplant Planting Date: 5/30/18 Harvest Date: See notes

Spacing: 22 inch Row Spacing: 36 inch

Tillage Type: Conventional Study Design: RCB Replications: 3

Plot Size: 5.3 ft wide x 30 ft long

Soil Type: Marlette fine sandy loam OM: 1.5% pH: 5.5
Sand: 60% Silt: 21% Clay: 19% CEC: 6.8

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRT	5/30/18	8:45 AM	77/70	F	Dry	5-7	63	80% Cloudy	N
PO1	6/21/18	11:47 AM	75/71	F	Dry	3-4	45	40% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/30	Broccoli	4"	3 LS	Good
5/30	Cabbage	4"	3 LS	Good
6/21	Broccoli	6-7"	7 LS	Good
6/21	Cabbage	6-7"	7 LS	Good
6/21	LACG = Large Crabgrass	2-4"	Veg	Many
6/21	BYGR = Barnyard Grass	2-4"	Veg	Many
6/21	COLQ = Common Lambsquarters	2-3"	Veg	Moderate
6/21	COPU = Common Purslane	1-4"	Veg	Moderate
6/21	CORW = Common Ragweed	1-3"	Veg	Many
6/21	RRPW = Redroot Pigweed	2-3" Dia	Veg	Moderate
6/21	WIRA = Wild Radish	2-6" Dia	Veg	Many
	YEFT = Yellow Foxtail			

Notes and Comments

- Spray applied with 4 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
- Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
- Broccoli was harvested from 8/6/18 to 8/17/18; Cabbage was harvested from 8/6/18 - 8/30/18

Weed Control in Broccoli and Cabbage - HTRC - 2018

Michigan State University

Weed Control in Broccoli & Cabbage - HTRC - 2018

Trial ID: 114-18-1
Protocol ID: 114-18-1

Location: East Lansing, MI
Investigator: Dr. Bernard Zandstra

Trial Year: 2018

Pest Code	Crop Code	Rating Date	Rating Type	Rating Unit	BROC		CABB		YEFT	COPU	CORW	WIRA
					19Jun18	19Jun18	19Jun18	19Jun18	19Jun18	19Jun18		
					RATING	RATING	RATING	RATING	RATING	RATING	RATING	
					1-10	1-10	1-10	1-10	1-10	1-10	1-10	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage						
1	Dual Magnum	7.62	EC	1.3	lb ai/a	PRT	1.7	1.7	10.0	10.0	4.3	5.3
2	Prowl H20	3.8	CS	1	lb ai/a	PRT	1.0	1.0	5.3	9.7	3.7	4.7
3	GoalTender	4	SC	0.5	lb ai/a	PRT	2.0	2.0	8.7	10.0	9.0	9.7
	Command	3	ME	0.5	lb ai/a	PRT						
4	GoalTender	4	SC	0.5	lb ai/a	PRT	1.3	1.3	9.0	10.0	9.7	9.7
	Spartan	4	F	0.188	lb ai/a	PRT						
5	Dual Magnum	7.62	EC	1.3	lb ai/a	PRT	1.7	2.3	10.0	10.0	10.0	9.7
	GoalTender	4	SC	0.5	lb ai/a	PRT						
6	Satellite Hydrocap	3.8	ME	1	lb ai/a	PRT	1.0	1.3	9.3	10.0	9.7	10.0
	GoalTender	4	SC	0.5	lb ai/a	PRT						
7	Dual Magnum	7.62	EC	1.3	lb ai/a	PRT	1.7	1.7	10.0	10.0	5.0	5.3
	GoalTender	4	SC	0.125	lb ai/a	PO1						
	Select Max	.97	EC	0.12	lb ai/a	PO1						
8	Dual Magnum	7.62	EC	1.3	lb ai/a	PRT	2.3	2.3	10.0	10.0	5.7	7.0
	BIR	1.67	SL	0.033	lb ai/a	PO1						
9	Dual Magnum	7.62	EC	1.3	lb ai/a	PRT	1.3	2.0	10.0	9.7	5.3	5.0
	BIR	1.67	SL	0.045	lb ai/a	PO1						
10	Dual Magnum	7.62	EC	1.3	lb ai/a	PRT	1.3	1.7	10.0	9.0	6.0	6.3
	Tough	5	EC	0.9	lb ai/a	PO1						
11	Untreated						1.0	1.0	1.0	1.0	1.0	1.0
LSD P=.05							0.89	0.91	1.65	0.61	3.32	3.09
Standard Deviation							0.53	0.53	0.97	0.36	1.95	1.81
CV							35.37	32.02	11.44	3.95	30.91	27.06

Weed Control in Broccoli and Cabbage - HTRC - 2018

Pest Code						BYGR		LACG				
Crop Code		BROC		CABB		BROC		CABB				
Rating Date		26Jun18		26Jun18		27Jun18		27Jun18				
Rating Type		STAND		STAND		RATING		RATING				
Rating Unit		NO./PLOT		NO./PLOT		1-10		1-10				
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Unit	Stage						
1	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT		21.7	20.3	1.7	1.3	10.0	10.0
2	Prowl H2O	3.8	CS	1 lb ai/a	PRT		24.3	23.7	1.0	1.0	5.0	4.0
3	GoalTender	4	SC	0.5 lb ai/a	PRT		23.3	24.0	2.3	2.3	8.7	3.7
	Command	3	ME	0.5 lb ai/a	PRT							
4	GoalTender	4	SC	0.5 lb ai/a	PRT		24.0	21.0	1.3	1.0	8.7	5.7
	Spartan	4	F	0.188 lb ai/a	PRT							
5	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT		21.7	22.0	1.7	1.7	10.0	10.0
	GoalTender	4	SC	0.5 lb ai/a	PRT							
6	Satellite Hydrocap	3.8	ME	1 lb ai/a	PRT		22.0	22.0	1.0	1.0	9.3	9.0
	GoalTender	4	SC	0.5 lb ai/a	PRT							
7	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT		23.0	22.7	2.7	3.0	10.0	10.0
	GoalTender	4	SC	0.125 lb ai/a	PO1							
	Select Max	.97	EC	0.12 lb ai/a	PO1							
8	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT		22.7	22.7	2.0	2.3	10.0	10.0
	BIR	1.67	SL	0.033 lb ai/a	PO1							
9	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT		23.3	22.3	1.7	2.0	10.0	10.0
	BIR	1.67	SL	0.045 lb ai/a	PO1							
10	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT		23.3	22.3	2.0	2.7	8.7	10.0
	Tough	5	EC	0.9 lb ai/a	PO1							
11	Untreated						22.7	20.0	1.0	1.0	1.0	1.0
	LSD P=.05						2.40	2.66	1.18	1.15	2.15	1.70
	Standard Deviation						1.41	1.56	0.69	0.67	1.26	1.00
	CV						6.15	7.08	41.52	38.36	15.21	13.2

Weed Control in Broccoli and Cabbage - HTRC - 2018

Pest Code			YEFT	COLQ	CORW	WIRA						
Crop Code			27Jun18	27Jun18	27Jun18	27Jun18	BROC	CABB				
Rating Date			RATING	RATING	RATING	RATING	STAND	STAND				
Rating Type			1-10	1-10	1-10	1-10	NO./PLOT	NO./PLOT				
Rating Unit												
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Unit	Stage						
1	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT		9.3	6.3	2.3	3.0	22.3	19.7
2	Prowl H2O	3.8	CS	1 lb ai/a	PRT		4.7	9.7	1.7	5.3	23.3	23.3
3	GoalTender	4	SC	0.5 lb ai/a	PRT		8.3	10.0	7.7	8.7	22.3	24.0
	Command	3	ME	0.5 lb ai/a	PRT							
4	GoalTender	4	SC	0.5 lb ai/a	PRT		7.7	10.0	8.3	9.3	23.3	20.7
	Spartan	4	F	0.188 lb ai/a	PRT							
5	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT		10.0	10.0	10.0	9.3	22.3	21.7
	GoalTender	4	SC	0.5 lb ai/a	PRT							
6	Satellite Hydrocap	3.8	ME	1 lb ai/a	PRT		8.0	10.0	9.7	10.0	22.7	21.0
	GoalTender	4	SC	0.5 lb ai/a	PRT							
7	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT		10.0	10.0	9.3	8.7	23.3	22.3
	GoalTender	4	SC	0.125 lb ai/a	PO1							
	Select Max	.97	EC	0.12 lb ai/a	PO1							
8	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT		10.0	9.7	7.7	6.0	21.0	22.3
	BIR	1.67	SL	0.033 lb ai/a	PO1							
9	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT		10.0	9.7	7.7	6.3	23.3	21.7
	BIR	1.67	SL	0.045 lb ai/a	PO1							
10	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT		9.7	7.0	8.0	7.7	23.3	22.0
	Tough	5	EC	0.9 lb ai/a	PO1							
11	Untreated						1.0	1.0	1.0	1.0	22.0	19.3
	LSD P=.05						1.91	3.76	1.19	2.30	2.75	3.28
	Standard Deviation						1.12	2.21	0.70	1.35	1.62	1.92
	CV						13.9	26.02	10.51	19.71	7.13	8.89

Weed Control in Broccoli and Cabbage - HTRC - 2018

Pest Code										
Crop Code										
Rating Date	BROC	CABB	BROC	BROC	BROC					
Rating Type	27Jul18	27Jul18	02Aug18	02Aug18	06Aug18					
Rating Unit	RATING	RATING	HARVEST	HARVEST	HARVEST					
	1-10	1-10	NO./PLOT	KG/PLOT	NO./PLOT					
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage					
1	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	2.7	2.3	1.3	0.367	0.7
2	Prowl H2O	3.8	CS	1 lb ai/a	PRT	1.7	2.0	3.7	1.193	1.7
3	GoalTender	4	SC	0.5 lb ai/a	PRT	1.0	1.0	5.7	1.800	1.0
	Command	3	ME	0.5 lb ai/a	PRT					
4	GoalTender	4	SC	0.5 lb ai/a	PRT	1.0	1.0	4.7	1.433	1.0
	Spartan	4	F	0.188 lb ai/a	PRT					
5	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	1.3	1.3	3.7	1.367	1.0
	GoalTender	4	SC	0.5 lb ai/a	PRT					
6	Satellite Hydrocap	3.8	ME	1 lb ai/a	PRT	1.3	1.0	4.0	1.313	0.3
	GoalTender	4	SC	0.5 lb ai/a	PRT					
7	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	2.0	1.3	3.3	1.127	0.7
	GoalTender	4	SC	0.125 lb ai/a	PO1					
	Select Max	.97	EC	0.12 lb ai/a	PO1					
8	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	2.7	2.3	0.7	0.187	0.7
	BIR	1.67	SL	0.033 lb ai/a	PO1					
9	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	2.3	3.0	1.0	0.407	1.0
	BIR	1.67	SL	0.045 lb ai/a	PO1					
10	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	1.3	1.7	3.0	0.653	1.7
	Tough	5	EC	0.9 lb ai/a	PO1					
11	Untreated					1.3	2.3	5.3	1.360	0.7
	LSD P=.05					1.27	1.18	3.83	1.4321	1.48
	Standard Deviation					0.74	0.69	2.25	0.8408	0.87
	CV					43.88	39.37	68.07	82.53	92.65

Weed Control in Broccoli and Cabbage - HTRC - 2018

Pest Code										
Crop Code										
Rating Date		BROC	BROC	BROC	BROC	BROC				
Rating Type		06Aug18	09Aug18	09Aug18	13Aug18	13Aug18				
Rating Unit		HARVEST	HARVEST	HARVEST	HARVEST	HARVEST				
		KG/PLOT	NO./PLOT	KG/PLOT	NO./PLOT	KG/PLOT				
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage					
1	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	0.173	6.3	2.033	6.0	1.560
2	Prowl H2O	3.8	CS	1 lb ai/a	PRT	0.540	7.0	1.947	6.3	1.827
3	GoalTender	4	SC	0.5 lb ai/a	PRT	0.413	10.3	4.080	3.7	1.220
	Command	3	ME	0.5 lb ai/a	PRT					
4	GoalTender	4	SC	0.5 lb ai/a	PRT	0.327	11.7	4.087	5.0	1.560
	Spartan	4	F	0.188 lb ai/a	PRT					
5	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	0.273	9.0	3.260	3.0	0.867
	GoalTender	4	SC	0.5 lb ai/a	PRT					
6	Satellite Hydrocap	3.8	ME	1 lb ai/a	PRT	0.107	14.3	6.047	2.0	0.547
	GoalTender	4	SC	0.5 lb ai/a	PRT					
7	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	0.287	6.7	2.260	4.0	0.933
	GoalTender	4	SC	0.125 lb ai/a	PO1					
	Select Max	.97	EC	0.12 lb ai/a	PO1					
8	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	0.153	7.3	2.260	5.0	1.480
	BIR	1.67	SL	0.033 lb ai/a	PO1					
9	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	0.307	11.0	3.900	3.7	0.880
	BIR	1.67	SL	0.045 lb ai/a	PO1					
10	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	0.480	10.0	3.547	4.3	0.933
	Tough	5	EC	0.9 lb ai/a	PO1					
11	Untreated					0.180	12.0	3.987	2.7	0.600
	LSD P=.05					0.4816	6.82	2.3988	4.47	1.2426
	Standard Deviation					0.2828	4.01	1.4084	2.63	0.7295
	CV					96.0	41.71	41.42	63.23	64.68

Weed Control in Broccoli and Cabbage - HTRC - 2018

Pest Code										
Crop Code				BROC		BROC		CABB		
Rating Date				17Aug18		17Aug18		06Aug18		
Rating Type				HARVEST		TOTAL		TOTAL		
Rating Unit				NO./PLOT		KG/PLOT		NO./PLOT		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage					
1	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	4.0	1.007	18.3	5.14	0.0
2	Prowl H2O	3.8	CS	1 lb ai/a	PRT	3.3	0.640	22.0	6.14	0.7
3	GoalTender	4	SC	0.5 lb ai/a	PRT	1.3	0.327	22.0	7.84	2.7
	Command	3	ME	0.5 lb ai/a	PRT					
4	GoalTender	4	SC	0.5 lb ai/a	PRT	0.7	0.167	23.0	7.57	1.3
	Spartan	4	F	0.188 lb ai/a	PRT					
5	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	2.7	0.673	19.3	6.44	0.7
	GoalTender	4	SC	0.5 lb ai/a	PRT					
6	Satellite Hydrocap	3.8	ME	1 lb ai/a	PRT	0.3	0.133	21.0	8.14	1.0
	GoalTender	4	SC	0.5 lb ai/a	PRT					
7	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	4.3	1.233	19.0	5.84	1.0
	GoalTender	4	SC	0.125 lb ai/a	PO1					
	Select Max	.97	EC	0.12 lb ai/a	PO1					
8	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	4.7	0.967	18.3	5.04	0.0
	BIR	1.67	SL	0.033 lb ai/a	PO1					
9	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	4.0	0.980	20.7	6.47	0.3
	BIR	1.67	SL	0.045 lb ai/a	PO1					
10	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	1.7	0.387	20.7	6.00	0.3
	Tough	5	EC	0.9 lb ai/a	PO1					
11	Untreated					1.0	0.200	21.7	6.32	0.3
	LSD P=.05					4.32	1.0446	4.02	1.806	1.11
	Standard Deviation					2.53	0.6133	2.36	1.0604	0.65
	CV					99.55	100.49	11.5	16.43	85.67

Weed Control in Broccoli and Cabbage - HTRC - 2018

Pest Code										
Crop Code										
Rating Date		CABB	CABB	CABB	CABB	CABB				
Rating Type		06Aug18	09Aug18	09Aug18	13Aug18	13Aug18				
Rating Unit		HARVEST	HARVEST	HARVEST	HARVEST	HARVEST				
		KG/PLOT	NO./PLOT	KG/PLOT	NO./PLOT	KG/PLOT				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Growth Unit	Stage				
1	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	0.000	0.7	0.680	1.3	1.493
2	Prowl H2O	3.8	CS	1 lb ai/a	PRT	1.127	4.0	4.873	4.7	5.273
3	GoalTender	4	SC	0.5 lb ai/a	PRT	3.753	5.0	5.673	4.0	5.160
	Command	3	ME	0.5 lb ai/a	PRT					
4	GoalTender	4	SC	0.5 lb ai/a	PRT	2.073	5.0	6.253	7.7	9.833
	Spartan	4	F	0.188 lb ai/a	PRT					
5	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	0.947	4.0	4.913	3.0	3.880
	GoalTender	4	SC	0.5 lb ai/a	PRT					
6	Satellite Hydrocap	3.8	ME	1 lb ai/a	PRT	1.253	6.0	7.813	5.7	7.833
	GoalTender	4	SC	0.5 lb ai/a	PRT					
7	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	1.240	2.0	2.533	4.0	4.720
	GoalTender	4	SC	0.125 lb ai/a	PO1					
	Select Max	.97	EC	0.12 lb ai/a	PO1					
8	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	0.000	1.7	1.960	2.3	2.913
	BIR	1.67	SL	0.033 lb ai/a	PO1					
9	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	0.420	2.0	2.400	3.0	3.953
	BIR	1.67	SL	0.045 lb ai/a	PO1					
10	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT	0.320	3.7	4.340	3.7	4.413
	Tough	5	EC	0.9 lb ai/a	PO1					
11	Untreated					0.480	3.3	3.967	2.3	2.867
LSD P=.05						1.4874	4.25	5.2586	3.35	4.4699
Standard Deviation						0.8733	2.50	3.0875	1.97	2.6244
CV						82.72	73.54	74.8	51.97	55.16

Weed Control in Broccoli and Cabbage - HTRC - 2018

Pest Code												
Crop Code												
Rating Date			CABB		CABB		CABB		CABB			
Rating Type			20Aug18		20Aug18		30Aug18		30Aug18			
Rating Unit			HARVEST		HARVEST		HARVEST		HARVEST			
			NO./PLOT		KG/PLOT		NO./PLOT		KG/PLOT			
Trt	Treatment	Form	Form	Rate	Growth							
No.	Name	Conc	Type	Rate	Unit	Stage						
1	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT		4.0	5.300	9.7	9.4717	15.7	16.94
2	Prowl H2O	3.8	CS	1 lb ai/a	PRT		2.3	2.913	10.0	10.9600	21.7	25.14
3	GoalTender	4	SC	0.5 lb ai/a	PRT		4.0	5.860	5.7	6.4967	21.3	26.94
	Command	3	ME	0.5 lb ai/a	PRT							
4	GoalTender	4	SC	0.5 lb ai/a	PRT		4.0	5.580	2.0	2.8100	20.0	26.55
	Spartan	4	F	0.188 lb ai/a	PRT							
5	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT		3.0	4.180	10.3	11.3200	21.0	25.24
	GoalTender	4	SC	0.5 lb ai/a	PRT							
6	Satellite Hydrocap	3.8	ME	1 lb ai/a	PRT		2.7	6.140	2.7	3.6900	18.0	26.73
	GoalTender	4	SC	0.5 lb ai/a	PRT							
7	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT		4.0	5.220	9.0	10.2967	20.0	24.01
	GoalTender	4	SC	0.125 lb ai/a	PO1							
	Select Max	.97	EC	0.12 lb ai/a	PO1							
8	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT		9.7	13.247	6.0	7.6300	19.7	25.75
	BIR	1.67	SL	0.033 lb ai/a	PO1							
9	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT		7.0	10.073	6.0	5.5833	18.3	22.43
	BIR	1.67	SL	0.045 lb ai/a	PO1							
10	Dual Magnum	7.62	EC	1.3 lb ai/a	PRT		3.7	5.207	9.3	10.5150	20.7	24.79
	Tough	5	EC	0.9 lb ai/a	PO1							
11	Untreated						2.0	2.567	4.0	6.9567	12.0	16.83
	LSD P=.05						3.81	6.1052	4.79	5.08720	5.64	7.715
	Standard Deviation						2.23	3.5845	2.81	2.98683	3.31	4.5298
	CV						53.05	59.48	41.46	38.32	17.47	19.06

Weed Control in Sweet Corn - HTRC - 2018

Project Code: 106-18-1

Location: East Lansing, MI
Block 137

Personnel: Bernard H. Zandstra, Nicole Soldan

Crop: Sweet Corn Variety: Aspire LL, SV9010SA RR
 Planting Method: Seeded Planting Date: 6/8/18 Harvest Date: See notes
 Spacing: 8-10 inch Row Spacing: 28 inch
 Tillage Type: Conventional Study Design: RCB Replications: 3
 Plot Size: 5.3 ft wide x 30 ft long

Soil Type: Marlette fine sandy loam OM: 1.4% pH: 7.0
 Sand: 62% Silt: 21% Clay: 16% CEC: 6.9

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	6/8/18	12:50 PM	81/76	F	Dry	1-4	46	65% Cloudy	N
PO1	7/10/18	8:50 AM	77/70	F	Dry	4-6	60	75% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
6/8	Sweet Corn		Preemergence	
6/8	No weeds			
7/10	Sweet Corn	8-12"	6-8 LS	Good
7/10	BYGR = Barnyard Grass	6-8"	Veg	Moderate
7/10	COLQ = Common Lambsquarters	4-12"	Veg	Many
7/10	COPU = Common Purslane	18" dia	Veg	Moderate
7/10	CORW = Common Ragweed	2-4"	Veg	Few
7/10	LATH = Ladysthumb	2-4" dia	Veg	Few
7/10	PEST = Perennial Sowthistle	8" dia	Veg	Moderate
7/10	RRPW = Redroot Pigweed	4-8"	Veg	Few
7/10	WIBW = Wild Buckwheat	3"-8"	Veg	Some
7/10	WIRA = Wild Radish	8-12"	Flower	Few

Notes and Comments

1. Spray applied with 4 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
3. Aspire is Liberty Link; SV9010SA is Roundup Ready.
4. PO1 at V4 corn 8-10 inches.
5. After harvest, maintain plots, mow stalks, and work the soil.
6. SV9010SA RR was harvested 8/28/18; Aspire LL was harvested 8/30/18

Weed Control in Sweet Corn - HTRC - 2018

Michigan State University

Weed Control in Sweet Corn - HTRC - 2018

Trial ID: 106-18-1
Protocol ID: 106-18-1

Location: East Lansing, MI
Investigator: Dr. Bernard Zandstra

Trial Year: 2018

Pest Code	Crop Code	Crop Name	Rating Date	Rating Type	Rating Unit	SWCO		YEFT		COLQ		
						ASPIRE	SV9010	ASPIRE	SV9010	ASPIRE	SV9010	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	29Jun18 RATING	29Jun18 RATING	29Jun18 RATING	29Jun18 RATING	16Jul18 RATING	16Jul18 RATING
1	Acuron	3.547	CS	2.58	lb ai/a	PRE	1.7	2.0	10.0	10.0	1.0	1.3
2	Zidua	85	WDG	0.21	lb ai/a	PRE	1.7	3.3	9.3	10.0	1.3	2.3
3	Lumax	3.948	L	1.23	lb ai/a	PRE	1.7	3.3	10.0	10.0	1.3	2.0
4	AAtrex	4	L	2	lb ai/a	PRE	2.0	2.3	9.7	10.0	1.7	2.3
5	Surpass	6.4	EC	2	lb ai/a	PRE	1.7	1.7	10.0	10.0	1.7	1.7
6	Outlook	6	EC	0.98	lb ai/a	PRE	2.7	2.7	10.0	10.0	1.7	2.0
7	Callisto	4	SC	0.24	lb ai/a	PRE	1.7	2.7	9.3	10.0	1.7	1.7
8	Dual Magnum	7.62	EC	0.95	lb ai/a	PRE	1.0	2.7	10.0	9.7	1.3	2.3
	Sandea	75	WG	0.047	lb ai/a	PO1						
	NIS	100	SL	0.25	% v/v	PO1						
9	Dual Magnum	7.62	EC	0.95	lb ai/a	PRE	2.0	2.0	10.0	9.3	1.0	1.7
10	Dual Magnum	7.62	EC	0.95	lb ai/a	PRE	1.0	2.0	10.0	9.0	1.0	1.7
	Shieldex 400 SC	3.33	SC	0.026	lb ai/a	PO1						
	COC	100	SL	1	% v/v	PO1						
	N Pak (AMS)	100	L	2.5	% v/v	PO1						
11	Dual Magnum	7.62	EC	0.95	lb ai/a	PRE	1.7	2.3	10.0	9.0	1.3	1.7
	Shieldex 400 SC	3.33	SC	0.035	lb ai/a	PO1						
	COC	100	SL	1	% v/v	PO1						
	N Pak (AMS)	100	L	2.5	% v/v	PO1						
12	Dual Magnum	7.62	EC	0.95	lb ai/a	PRE	1.3	2.3	10.0	9.0	1.0	1.7
	Impact	2.8	SC	0.022	lb ai/a	PO1						
	COC	100	SL	1	% v/v	PO1						
	N Pak (AMS)	100	L	2.5	% v/v	PO1						
13	Dual Magnum	7.62	EC	0.95	lb ai/a	PRE	2.0	2.3	10.0	9.0	1.3	2.3
	Laudis	3.5	SC	0.082	lb ai/a	PO1						
	COC	100	SL	1	% v/v	PO1						
	N Pak (AMS)	100	L	2.5	% v/v	PO1						
14	Dual Magnum	7.62	EC	0.95	lb ai/a	PRE	1.0	2.0	10.0	9.3	1.3	6.3
	Liberty 280	2.34	L	0.37	lb ai/a	PO1						
15	Dual Magnum	7.62	EC	0.95	lb ai/a	PRE	2.0	2.0	10.0	8.3	1.3	1.7
	Roundup PowerMax	5.5	L	0.95	lb ai/a	PO1						
16	Untreated						1.3	1.0	6.7	4.7	1.3	1.7
	LSD P=.05						1.11	1.27	1.46	1.63	0.91	1.56
	Standard Deviation						0.66	0.76	0.88	0.98	0.55	0.94
	CV						40.32	33.21	9.05	10.59	40.98	43.63

Weed Control in Sweet Corn - HTRC - 2018

Pest Code					BYGR	COLQ	COPU	CORW	RRPW
Crop Code									
Crop Name									
Rating Date					16Jul18	16Jul18	16Jul18	16Jul18	16Jul18
Rating Type					RATING	RATING	RATING	RATING	RATING
Rating Unit					1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage				
1	Acuron	3.547	CS	2.58 lb ai/a	PRE	9.7	10.0	10.0	10.0
2	Zidua	85	WDG	0.21 lb ai/a	PRE	8.3	8.7	8.7	9.3
3	Lumax	3.948	L	1.23 lb ai/a	PRE	10.0	10.0	10.0	10.0
4	AAtrex	4	L	2 lb ai/a	PRE	6.7	10.0	10.0	10.0
5	Surpass	6.4	EC	2 lb ai/a	PRE	10.0	10.0	9.3	10.0
6	Outlook	6	EC	0.98 lb ai/a	PRE	10.0	8.7	9.0	10.0
7	Callisto	4	SC	0.24 lb ai/a	PRE	5.7	10.0	6.0	10.0
8	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	9.0	9.0	5.7	9.7
	Sandea	75	WG	0.047 lb ai/a	PO1				
	NIS	100	SL	0.25 % v/v	PO1				
9	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	8.0	5.7	10.0	7.3
10	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	9.0	8.3	9.3	9.7
	Shieldex 400 SC	3.33	SC	0.026 lb ai/a	PO1				
	COC	100	SL	1 % v/v	PO1				
	N Pak (AMS)	100	L	2.5 % v/v	PO1				
11	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	9.3	8.3	9.7	10.0
	Shieldex 400 SC	3.33	SC	0.035 lb ai/a	PO1				
	COC	100	SL	1 % v/v	PO1				
	N Pak (AMS)	100	L	2.5 % v/v	PO1				
12	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	9.3	7.7	10.0	9.7
	Impact	2.8	SC	0.022 lb ai/a	PO1				
	COC	100	SL	1 % v/v	PO1				
	N Pak (AMS)	100	L	2.5 % v/v	PO1				
13	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	9.0	8.0	5.7	9.0
	Laudis	3.5	SC	0.082 lb ai/a	PO1				
	COC	100	SL	1 % v/v	PO1				
	N Pak (AMS)	100	L	2.5 % v/v	PO1				
14	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	9.7	8.3	10.0	9.7
	Liberty 280	2.34	L	0.37 lb ai/a	PO1				
15	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	9.7	8.3	8.3	10.0
	Roundup PowerMax	5.5	L	0.95 lb ai/a	PO1				
16	Untreated					8.3	9.0	9.3	9.7
	LSD P=.05					2.02	1.63	2.76	1.27
	Standard Deviation					1.21	0.98	1.66	0.76
	CV					13.65	11.18	18.81	7.94

Weed Control in Sweet Corn - HTRC - 2018

Pest Code					YEFT	COLQ	CORW			
Crop Code					SWCO	SWCO				
Crop Name					ASPIRE	SV9010				
Rating Date					09Jul18	09Jul18	09Jul18	09Jul18	09Jul18	
Rating Type					RATING	RATING	RATING	RATING	RATING	
Rating Unit					1-10	1-10	1-10	1-10	1-10	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage					
1	Acuron	3.547	CS	2.58 lb ai/a	PRE	1.0	1.3	9.7	10.0	10.0
2	Zidua	85	WDG	0.21 lb ai/a	PRE	1.3	2.3	7.7	9.3	10.0
3	Lumax	3.948	L	1.23 lb ai/a	PRE	1.0	3.0	9.7	10.0	10.0
4	AAtrex	4	L	2 lb ai/a	PRE	1.7	2.3	8.7	10.0	10.0
5	Surpass	6.4	EC	2 lb ai/a	PRE	1.7	1.7	10.0	10.0	10.0
6	Outlook	6	EC	0.98 lb ai/a	PRE	1.7	2.7	10.0	9.3	10.0
7	Callisto	4	SC	0.24 lb ai/a	PRE	1.3	1.7	5.7	10.0	9.7
8	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	1.0	2.7	9.3	8.0	9.0
	Sandea	75	WG	0.047 lb ai/a	PO1					
	NIS	100	SL	0.25 % v/v	PO1					
9	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	1.0	1.7	9.7	7.7	9.7
10	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	1.0	2.0	9.0	7.0	9.0
	Shieldex 400 SC	3.33	SC	0.026 lb ai/a	PO1					
	COC	100	SL	1 % v/v	PO1					
	N Pak (AMS)	100	L	2.5 % v/v	PO1					
11	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	1.0	2.3	9.0	7.7	7.3
	Shieldex 400 SC	3.33	SC	0.035 lb ai/a	PO1					
	COC	100	SL	1 % v/v	PO1					
	N Pak (AMS)	100	L	2.5 % v/v	PO1					
12	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	1.0	2.0	8.7	7.0	9.7
	Impact	2.8	SC	0.022 lb ai/a	PO1					
	COC	100	SL	1 % v/v	PO1					
	N Pak (AMS)	100	L	2.5 % v/v	PO1					
13	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	1.0	2.0	8.3	7.0	8.7
	Laudis	3.5	SC	0.082 lb ai/a	PO1					
	COC	100	SL	1 % v/v	PO1					
	N Pak (AMS)	100	L	2.5 % v/v	PO1					
14	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	1.3	2.0	9.7	7.7	9.7
	Liberty 280	2.34	L	0.37 lb ai/a	PO1					
15	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	1.3	1.3	9.3	7.0	9.7
	Roundup PowerMax	5.5	L	0.95 lb ai/a	PO1					
16	Untreated					1.3	1.7	1.0	1.0	7.0
	LSD P=.05					0.69	1.73	2.00	1.86	2.86
	Standard Deviation					0.41	1.04	1.20	1.11	1.71
	CV					33.76	50.82	14.18	13.84	18.35

Weed Control in Sweet Corn - HTRC - 2018

Pest Code						SWCO	SWCO	SWCO	SWCO
Crop Code						SV9010SA	SV9010SA	ASPIRE LL	ASPIRE LL
Crop Name						28Aug18	28Aug18	30Aug18	30Aug18
Rating Date						HARVEST	HARVEST	HARVEST	HARVEST
Rating Type						NO./PLOT	KG/PLOT	NO./PLOT	KG/PLOT
Rating Unit									
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage				
1	Acuron	3.547	CS	2.58 lb ai/a	PRE	43.0	16.55	39.0	14.62
2	Zidua	85	WDG	0.21 lb ai/a	PRE	29.7	11.02	34.0	11.60
3	Lumax	3.948	L	1.23 lb ai/a	PRE	32.3	12.19	36.7	12.81
4	AAtrex	4	L	2 lb ai/a	PRE	35.0	12.76	32.3	11.45
5	Surpass	6.4	EC	2 lb ai/a	PRE	36.0	13.34	36.3	12.29
6	Outlook	6	EC	0.98 lb ai/a	PRE	33.3	12.37	26.3	9.36
7	Callisto	4	SC	0.24 lb ai/a	PRE	35.3	13.08	39.0	13.37
8	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	25.3	9.60	36.0	12.66
	Sandea	75	WG	0.047 lb ai/a	PO1				
	NIS	100	SL	0.25 % v/v	PO1				
9	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	34.7	13.15	31.0	11.30
10	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	34.7	13.13	34.3	12.44
	Shieldex 400 SC	3.33	SC	0.026 lb ai/a	PO1				
	COC	100	SL	1 % v/v	PO1				
	N Pak (AMS)	100	L	2.5 % v/v	PO1				
11	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	32.0	13.06	31.7	11.97
	Shieldex 400 SC	3.33	SC	0.035 lb ai/a	PO1				
	COC	100	SL	1 % v/v	PO1				
	N Pak (AMS)	100	L	2.5 % v/v	PO1				
12	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	33.7	13.58	36.7	13.47
	Impact	2.8	SC	0.022 lb ai/a	PO1				
	COC	100	SL	1 % v/v	PO1				
	N Pak (AMS)	100	L	2.5 % v/v	PO1				
13	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	32.0	12.47	33.7	12.51
	Laudis	3.5	SC	0.082 lb ai/a	PO1				
	COC	100	SL	1 % v/v	PO1				
	N Pak (AMS)	100	L	2.5 % v/v	PO1				
14	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	19.0	6.14	36.3	13.41
	Liberty 280	2.34	L	0.37 lb ai/a	PO1				
15	Dual Magnum	7.62	EC	0.95 lb ai/a	PRE	38.0	14.70	34.7	12.48
	Roundup PowerMax	5.5	L	0.95 lb ai/a	PO1				
16	Untreated					28.0	9.66	26.3	8.69
	LSD P=.05					10.29	4.44	7.78	3.27
	Standard Deviation					6.17	2.66	4.67	1.96
	CV					18.91	21.63	13.71	16.13

Weed Control in Cucumber - HTRC - 2018

Project Code: 108-18-1

Location: East Lansing, MI
Block 117

Personnel: Bernard H. Zandstra, Nicole Soldan

Crop: Cucumber

Variety: Expedition

Planting Method: Seeded

Planting Date: 6/6/18

Harvest Date: 7/20/18

Spacing: 3"

Row Spacing: 14"; 3 rows/plot

Tillage Type: Conventional

Study Design: RCB

Replications: 3

Plot Size: 5.3 ft wide x 30 ft long

Soil Type: Capac loam

OM: 1.1%

pH: 6.7

Sand: 74%

Silt: 16%

Clay: 10%

CEC: 4.0

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	6/6	3:00 PM	72/70	F	Moist	1-3 NE	28	40% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
6/6	Cucumber		Preemergence	
6/6	No Weeds			

BYGR = Barnyard Grass
 LACG = Large Crabgrass
 YEFT = Yellow Foxtail
 COLQ = Common Lambsquarters
 CORW = Common Ragweed
 WIRA = Wild Radish

Notes and Comments

- Spray applied with 4 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
 - Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
 - The area of the field for treatments 1-6 was tilled on 6/4/18 two days before planting and applying herbicides. The area of the field for treatments 7-12 was tilled on 5/25/18 two weeks before planting and applying herbicides and again on 6/4/18 two days before planting and applying herbicides.
-

Weed Control in Cucumber - HTRC - 2018

Michigan State University

Weed Control in Cucumber - HTRC - 2018

Trial ID: 108-18-1
Protocol ID: 108-18-1

Location: East Lansing, MI
Investigator: Dr. Bernard Zandstra

Trial Year: 2018

Pest Code	Crop Code	Rating Date	Rating Type	Rating Unit	YEFT		COLQ		CORW		WIRA		BYGR	
					CUCU	CUCU	CUCU	CUCU	CUCU	CUCU	CUCU	CUCU		
Trt No	Treatment Name	Form	Form	Rate	Growth	26Jun18	26Jun18	26Jun18	26Jun18	26Jun18	03Jul18	03Jul18	03Jul18	03Jul18
		Conc	Type	Rate	Unit	1-10	1-10	1-10	1-10	1-10	1-10	1-10	1-10	1-10
One Tillings:														
1	Curbit	3	EC	1.13 lb ai/a	PRE	3.3	9.7	10.0	8.3	7.7	3.7	10.0		
	Command	3	ME	0.375 lb ai/a	PRE									
2	Curbit	3	EC	0.75 lb ai/a	PRE	1.7	9.7	10.0	9.0	8.0	1.3	8.7		
	Command	3	ME	0.25 lb ai/a	PRE									
3	Curbit	3	EC	0.75 lb ai/a	PRE	3.0	9.3	10.0	10.0	9.3	3.0	10.0		
	Command	3	ME	0.25 lb ai/a	PRE									
	Reflex	2	SL	0.125 lb ai/a	PRE									
4	Curbit	3	EC	0.75 lb ai/a	PRE	6.0	7.0	10.0	10.0	7.7	5.3	9.7		
	Command	3	ME	0.25 lb ai/a	PRE									
	BIR	1.67	SL	0.033 lb ai/a	PRE									
5	Curbit	3	EC	0.75 lb ai/a	PRE	2.3	10.0	10.0	9.3	10.0	2.3	9.7		
	Command	3	ME	0.25 lb ai/a	PRE									
	Sandea	75	WG	0.023 lb ai/a	PRE									
6	Untreated				PRE	1.0	1.0	1.0	1.3	2.3	2.0	1.0		
Two Tillings:														
7	Curbit	3	EC	1.13 lb ai/a	PRE	1.3	9.7	10.0	9.7	7.3	1.3	9.3		
	Command	3	ME	0.375 lb ai/a	PRE									
8	Curbit	3	EC	0.75 lb ai/a	PRE	1.7	9.3	10.0	10.0	7.3	1.3	9.3		
	Command	3	ME	0.25 lb ai/a	PRE									
9	Curbit	3	EC	0.75 lb ai/a	PRE	2.7	9.7	10.0	10.0	10.0	2.0	9.3		
	Command	3	ME	0.25 lb ai/a	PRE									
	Reflex	2	SL	0.125 lb ai/a	PRE									
10	Curbit	3	EC	0.75 lb ai/a	PRE	8.0	10.0	10.0	10.0	7.0	6.3	10.0		
	Command	3	ME	0.25 lb ai/a	PRE									
	BIR	1.67	SL	0.033 lb ai/a	PRE									
11	Curbit	3	EC	0.75 lb ai/a	PRE	1.7	9.3	10.0	10.0	9.7	2.0	9.0		
	Command	3	ME	0.25 lb ai/a	PRE									
	Sandea	75	WG	0.023 lb ai/a	PRE									
12	Untreated				PRE	1.0	1.0	1.0	4.0	1.7	1.0	1.0		
	LSD P=.05					3.19	2.67	0.00	2.88	1.69	2.98	1.24		
	Standard Deviation					1.88	1.58	0.00	1.70	1.00	1.76	0.73		
	CV					67.09	19.76	0.0	20.07	13.58	66.6	9.07		

Weed Control in Cucumber - HTRC - 2018

Pest Code					LACG	YEFT	COLQ	CORW	WIRA			
Crop Code										CUCU		
Rating Date					03Jul18	03Jul18	03Jul18	03Jul18	03Jul18	20Jul18		
Rating Type					RATING	RATING	RATING	RATING	RATING	HRVT-PLANT		
Rating Unit					1-10	1-10	1-10	1-10	1-10	KG/PLOT		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Unit	Stage						
One Tilling:												
1	Curbit	3 EC		1.13 lb ai/a	PRE		10.0	9.3	10.0	8.3	6.0	20.31
	Command	3 ME		0.375 lb ai/a	PRE							
2	Curbit	3 EC		0.75 lb ai/a	PRE		10.0	9.3	9.3	8.7	5.0	30.10
	Command	3 ME		0.25 lb ai/a	PRE							
3	Curbit	3 EC		0.75 lb ai/a	PRE		10.0	9.0	10.0	9.7	9.3	23.96
	Command	3 ME		0.25 lb ai/a	PRE							
	Reflex	2 SL		0.125 lb ai/a	PRE							
4	Curbit	3 EC		0.75 lb ai/a	PRE		10.0	9.0	10.0	9.0	6.0	7.80
	Command	3 ME		0.25 lb ai/a	PRE							
	BIR	1.67 SL		0.033 lb ai/a	PRE							
5	Curbit	3 EC		0.75 lb ai/a	PRE		10.0	8.7	10.0	8.3	9.3	29.80
	Command	3 ME		0.25 lb ai/a	PRE							
	Sandea	75 WG		0.023 lb ai/a	PRE							
6	Untreated				PRE		1.0	1.0	1.0	1.0	1.0	17.51
Two Tillings:												
7	Curbit	3 EC		1.13 lb ai/a	PRE		10.0	9.0	10.0	9.7	4.7	38.33
	Command	3 ME		0.375 lb ai/a	PRE							
8	Curbit	3 EC		0.75 lb ai/a	PRE		9.7	9.0	10.0	9.3	2.7	40.03
	Command	3 ME		0.25 lb ai/a	PRE							
9	Curbit	3 EC		0.75 lb ai/a	PRE		9.3	8.3	10.0	10.0	9.3	35.15
	Command	3 ME		0.25 lb ai/a	PRE							
	Reflex	2 SL		0.125 lb ai/a	PRE							
10	Curbit	3 EC		0.75 lb ai/a	PRE		10.0	9.3	10.0	10.0	3.0	13.93
	Command	3 ME		0.25 lb ai/a	PRE							
	BIR	1.67 SL		0.033 lb ai/a	PRE							
11	Curbit	3 EC		0.75 lb ai/a	PRE		10.0	8.3	10.0	10.0	8.3	46.26
	Command	3 ME		0.25 lb ai/a	PRE							
	Sandea	75 WG		0.023 lb ai/a	PRE							
12	Untreated				PRE		1.0	1.0	1.0	1.0	1.0	24.53
LSD P=.05							0.61	0.86	0.56	1.97	2.24	14.30
Standard Deviation							0.36	0.51	0.33	1.16	1.32	8.45
CV							4.26	6.64	3.95	14.71	24.16	30.92

Weed Control in Cucumber - HTRC - 2018

Pest Code	CUCU	CUCU	CUCU	CUCU	CUCU					
Crop Code	20Jul18	23Jul18	23Jul18	23Jul18	23Jul18					
Rating Date	HRVT-FRUIT	GRADE1	GRADE2	GRADE3	GRADE4					
Rating Type	KG/PLOT	KG/PLOT	KG/PLOT	KG/PLOT	KG/PLOT					
Rating Unit										
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage					
One Tillage:										
1	Curbit	3	EC	1.13 lb ai/a	PRE	20.08	0.94	6.08	10.87	1.59
	Command	3	ME	0.375 lb ai/a	PRE					
2	Curbit	3	EC	0.75 lb ai/a	PRE	29.38	0.99	7.94	18.27	2.39
	Command	3	ME	0.25 lb ai/a	PRE					
3	Curbit	3	EC	0.75 lb ai/a	PRE	26.86	1.28	5.33	18.31	1.61
	Command	3	ME	0.25 lb ai/a	PRE					
	Reflex	2	SL	0.125 lb ai/a	PRE					
4	Curbit	3	EC	0.75 lb ai/a	PRE	4.81	0.52	2.44	1.53	0.18
	Command	3	ME	0.25 lb ai/a	PRE					
	BIR	1.67	SL	0.033 lb ai/a	PRE					
5	Curbit	3	EC	0.75 lb ai/a	PRE	26.72	1.68	6.40	15.67	2.04
	Command	3	ME	0.25 lb ai/a	PRE					
	Sandea	75	WG	0.023 lb ai/a	PRE					
6	Untreated				PRE	12.96	1.30	5.53	5.51	0.14
Two Tillings:										
7	Curbit	3	EC	1.13 lb ai/a	PRE	33.54	2.01	10.35	18.34	1.59
	Command	3	ME	0.375 lb ai/a	PRE					
8	Curbit	3	EC	0.75 lb ai/a	PRE	32.45	2.07	11.29	16.50	1.48
	Command	3	ME	0.25 lb ai/a	PRE					
9	Curbit	3	EC	0.75 lb ai/a	PRE	35.01	1.89	9.46	20.24	2.25
	Command	3	ME	0.25 lb ai/a	PRE					
	Reflex	2	SL	0.125 lb ai/a	PRE					
10	Curbit	3	EC	0.75 lb ai/a	PRE	7.63	0.98	2.85	3.12	0.30
	Command	3	ME	0.25 lb ai/a	PRE					
	BIR	1.67	SL	0.033 lb ai/a	PRE					
11	Curbit	3	EC	0.75 lb ai/a	PRE	36.71	2.24	10.36	20.29	2.34
	Command	3	ME	0.25 lb ai/a	PRE					
	Sandea	75	WG	0.023 lb ai/a	PRE					
12	Untreated				PRE	15.67	1.61	7.65	5.46	0.23
LSD P=.05						12.57	0.69	3.40	7.98	1.88
Standard Deviation						7.42	0.41	2.01	4.72	1.11
CV						31.6	27.78	28.08	36.71	82.35

Weed Control in Garlic with Bicyclopyrone - HTRC - 2017-2018

Project Code: 112-17-5

Location: East Lansing, MI
Block 113

Personnel: Bernard H. Zandstra, Nicole Soldan

Crop: Garlic

Variety: California Late

Planting Method: Hand Planted

Planting Date: 10/19/2017

Harvest Date: 7/30/2018

Spacing: 2 inch

Row Spacing: 6 ft

Tillage Type: Conventional

Study Design: RCB

Replications: 3

Plot Size: 5.3 ft wide x 20 ft long

Soil Type: Spinks Loamy Sand

OM: 3.6%

pH: 6.5

Sand: 70%

Silt: 18%

Clay: 13%

CEC: 7.4

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	10/20/17	10:00 AM	57/48	F	Damp	4-5 SE	58	0% Cloudy	Y
PO1/DIR	4/24/18	11:15 AM	59/51	F	Moist	6-8 NE	65	100% Cloudy	N

Crop and Weed Information at Application

Date	Crop	Height or Diameter	Growth Stage	Density
10/20/17	Garlic		Dormant Seed	
10/20/17	No weeds			
4/24/18	Garlic	3-4"	3-4 leaves	Good
4/24/18	ANBG = Annual Bluegrass	0.5-1"	Veg	Many

Notes and Comments

1. Spray applied with 4 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
 2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
 3. Garlic was planted in October 2017 and Harvested in July 2018.
 4. 10/20/2017 Prowl H₂O 0.71 lb ai/a applied to whole field after planting.
 5. 4/18/2018 Prowl H₂O 1.4 lb ai/a and Buctril 2 EC 0.188 lb ai/a applied to garlic at 3-4" high after weeds emerged.
 6. After harvest, garlic was air-dried for 2 weeks and then cleaned and weighed again.
-

Weed Control in Garlic with Bicyclopyrone - HTRC - 2017-2018

Michigan State University

Weed Control in Garlic with Bicyclopyrone - HTRC - 2017-2018

Trial ID: 112-17-5 Location: East Lansing, MI Trial Year: 2017/18
 Protocol ID: 112-17-5 Investigator: Dr. Bernard Zandstra

Pest Code				ANBG			ANBG					
	Crop Code	GARLIC	GARLIC	GARLIC	GARLIC	GARLIC	GARLIC	GARLIC	GARLIC			
Rating Date	18Apr18	30Apr18	30Apr18	21May18	21May18	28May18						
Rating Type	RATING	RATING	RATING	RATING	RATING	RATING						
Rating Unit	1-10	1-10	1-10	1-10	1-10	1-10						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Unit	Growth Stage						
1	Untreated						1.3	2.0	9.0	2.0	6.0	1.0
2	BIR	1.67	SL	0.033	lb ai/a	PRE	1.7	1.3	9.0	1.7	7.3	1.0
3	BIR	1.67	SL	0.045	lb ai/a	PRE	1.7	1.3	7.0	2.0	6.0	1.3
4	BIR	1.67	SL	0.09	lb ai/a	PRE	1.3	1.3	7.7	1.3	6.3	1.3
5	Chateau SW	51	WDG	0.192	lb ai/a	PRE	2.7	2.7	10.0	2.7	10.0	2.7
6	BIR	1.67	SL	0.033	lb ai/a	PO1	1.7	1.7	9.3	1.3	7.0	1.0
	NIS	100	SL	0.25	% v/v	PO1						
7	BIR	1.67	SL	0.045	lb ai/a	PO1	1.3	2.0	9.7	3.0	7.0	1.7
	NIS	100	SL	0.25	% v/v	PO1						
8	BIR	1.67	SL	0.09	lb ai/a	PO1	1.3	1.3	9.0	3.3	7.7	3.0
	NIS	100	SL	0.25	% v/v	PO1						
9	Prowl H2O	3.8	CS	0.71	lb ai/a	PO1	1.7	1.7	9.3	2.0	8.0	1.3
10	BIR	1.67	SL	0.045	lb ai/a	PO1 DIR	1.0	1.0	8.0	1.7	7.3	1.0
	NIS	100	SL	0.25	% v/v	PO1 DIR						
11	GoalTender	4	SC	.125	lb ai/a	PO1 DIR	2.0	1.7	9.3	1.7	8.3	1.3
12	Outlook	6	EC	0.75	lb ai/a	PRE	1.3	2.3	10.0	1.7	10.0	1.3
LSD P=.05							0.88	1.25	2.71	0.80	3.31	0.77
Standard Deviation							0.52	0.74	1.60	0.47	1.96	0.45
CV							32.98	43.49	17.91	23.38	25.79	30.15

Weed Control in Garlic with Bicyclopyrone - HTRC - 2017-2018

Pest Code		ANBG										
Crop Code		GARLIC			GARLIC			GARLIC		GARLIC		
Rating Date		28May18	15Jun18	30Jul18	30Jul18	14Aug18	14Aug18	14Aug18				
Rating Type		RATING	RATING	COUNT	WEIGHT	DRY COUNT	DRY WEIGHT					
Rating Unit		1-10	1-10	BULB/PL	KG/PLOT	BULB/PL	KG/PLOT					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Rate Unit	Growth Stage						
1	Untreated						6.0	1.0	105.0	3.78	103.0	3.05
2	BIR	1.67	SL	0.033	lb ai/a	PRE	6.7	1.3	115.3	4.07	118.3	3.21
3	BIR	1.67	SL	0.045	lb ai/a	PRE	5.0	1.3	112.7	3.95	111.7	3.13
4	BIR	1.67	SL	0.09	lb ai/a	PRE	5.3	1.7	103.7	3.23	107.7	2.71
5	Chateau SW	51	WDG	0.192	lb ai/a	PRE	10.0	2.3	85.3	2.60	85.7	2.17
6	BIR	1.67	SL	0.033	lb ai/a	PO1	5.7	1.3	109.7	3.80	107.7	3.07
	NIS	100	SL	0.25	% v/v	PO1						
7	BIR	1.67	SL	0.045	lb ai/a	PO1	7.0	1.7	97.0	3.15	96.3	2.57
	NIS	100	SL	0.25	% v/v	PO1						
8	BIR	1.67	SL	0.09	lb ai/a	PO1	6.3	2.3	99.0	2.72	96.3	2.27
	NIS	100	SL	0.25	% v/v	PO1						
9	Prowl H20	3.8	CS	0.71	lb ai/a	PO1	6.3	1.7	99.0	3.49	98.3	2.86
10	BIR	1.67	SL	0.045	lb ai/a	PO1 DIR	5.3	1.3	100.0	3.56	98.3	2.91
	NIS	100	SL	0.25	% v/v	PO1 DIR						
11	GoalTender	4	SC	.125	lb ai/a	PO1 DIR	7.3	1.3	103.3	3.63	103.3	2.94
12	Outlook	6	EC	0.75	lb ai/a	PRE	10.0	1.7	104.0	3.06	104.3	2.48
LSD P=.05							2.85	1.24	21.63	1.08	21.90	0.83
Standard Deviation							1.68	0.73	12.77	0.64	12.93	0.4877
CV							24.9	46.32	12.42	18.63	12.61	17.53

Performance of Prometryn on Transplanted Leek - IR4 - Schreur - 2018

Project Code: 112-18-9

Location:
Hudsonville, MI

Personnel: Bernard H. Zandstra, Nicole Soldan
 Crop: Leek Variety: American Flag
 Planting Method: Transplant Planting Date: 5/8/18 Harvest Date: 9/6/18
 Spacing: 6 inch Row Spacing: 20 inch; 2 rows/plot
 Tillage Type: Conventional Study Design: RCB Replications: 3
 Plot Size: 2.7 ft wide x 30 ft long

Soil Type: Carlisle muck OM: 69.8% pH: 5.6
 Sand: 13% Silt: 15% Clay: 2% CEC: N/A

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PO1	5/25	11:00 AM	84/62	F	DAMP	8-9 SW	48	0% Cloudy	N
PO2	7/19	10:45 AM	83/74	F	DRY	7-8 SE	46	60% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/25	Leek	6-8"	3-5 LS	Good
5/25	COCW = Common Chickweed	0.5"	Cotyledon 2LS	Many
5/25	COPU = Common Purslane	0.2-0.5"	Cotyledon	Many
5/25	LATH = Ladysthumb	0.25-0.5"	Cotyledon	Many
5/25	MAYC = Marsh Yellowcress	0.25-0.5"	1-2 LS	Moderate
7/19	CEPR = Common evening Primrose	8-10"	Veg	Few
7/19	COPU = Common Purslane	4-6"	Veg	Few
7/19	LATH = Ladysthumb	6-8"	Veg	Few
7/19	RRPW = Redroot Pigweed	6-8"	Veg	Few
	COGR = Common Groundsel			
	LACG = Large Crabgrass			

Notes and Comments

1. Spray applied with 4 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
3. Prowl H₂O 1.9 lb ai/a applied 5/8/18 post-transplant.

Performance of Prometryn on Transplanted Leek - IR4 - Schreur - 2018

Michigan State University

Performance of Prometryn on Transplanted Leek - IR4 - Schreur - 2018

Trial ID: 112-18-9 Location: Hudsonville, MI Trial Year: 2018
 Protocol ID: 112-18-9 Investigator: Dr. Bernard Zandstra

Pest Code				COGR	COPU	LATH	RRPW						
Crop Code				LEEK				LEEK					
Rating Date				12Jun18	12Jun18	12Jun18	12Jun18	12Jun18	25Jun18				
Rating Type				RATING	RATING	RATING	RATING	RATING	RATING				
Rating Unit				1-10	1-10	1-10	1-10	1-10	1-10				
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Unit	Growth	Stage						
1	Untreated Weed-Free					1.0	3.7	5.0	8.0	5.0	1.0		
2	Caparol	4 L		1.6 lb ai/a		PO1,PO2		1.0	7.3	8.7	10.0	10.0	1.3
3	Caparol	4 L		3.2 lb ai/a		PO1,PO2		1.0	7.7	9.7	10.0	10.0	1.0
4	Caparol	4 L		1.6 lb ai/a		PO1,PO2		1.3	8.7	10.0	10.0	10.0	1.7
	Prowl H2O	3.8 CS		1.9 lb ai/a		PO1,PO2							
5	Prowl H2O	3.8 CS		1.9 lb ai/a		PO1,PO2		1.0	7.7	7.7	7.7	6.7	1.0
6	Outlook	6 EC		0.98 lb ai/a		PO1,PO2		1.0	10.0	7.7	7.7	9.0	1.0
7	Dual Magnum	7.62 EC		1.26 lb ai/a		PO1,PO2		1.0	7.0	6.7	6.7	7.7	1.0
	LSD P=.05					0.39	3.93	2.80	2.66	3.00	0.53		
	Standard Deviation					0.22	2.21	1.58	1.50	1.69	0.30		
	CV					20.83	29.72	19.94	17.45	20.23	25.85		

Pest Code				CEPR	COGR	COPU	LATH	RRPW					
Crop Code										LEEK			
Rating Date				25Jun18		25Jun18		25Jun18		23Jul18			
Rating Type				RATING	RATING	RATING	RATING	RATING	RATING	RATING			
Rating Unit				1-10	1-10	1-10	1-10	1-10	1-10	1-10			
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Unit	Growth	Stage						
1	Untreated Weed-Free					3.0	3.3	3.3	2.0	3.3	1.3		
2	Caparol	4 L		1.6 lb ai/a		PO1,PO2		10.0	4.3	3.7	10.0	5.3	1.7
3	Caparol	4 L		3.2 lb ai/a		PO1,PO2		10.0	4.0	5.7	10.0	7.0	2.3
4	Caparol	4 L		1.6 lb ai/a		PO1,PO2		10.0	4.7	7.7	10.0	6.7	2.0
	Prowl H2O	3.8 CS		1.9 lb ai/a		PO1,PO2							
5	Prowl H2O	3.8 CS		1.9 lb ai/a		PO1,PO2		9.0	3.0	7.7	4.7	2.0	2.0
6	Outlook	6 EC		0.98 lb ai/a		PO1,PO2		7.3	9.0	6.3	5.7	6.3	2.0
7	Dual Magnum	7.62 EC		1.26 lb ai/a		PO1,PO2		7.0	4.7	6.0	6.3	4.0	1.0
	LSD P=.05					4.09	4.41	3.15	3.23	2.84	1.59		
	Standard Deviation					2.30	2.48	1.77	1.82	1.60	0.90		
	CV					28.57	52.61	30.73	26.14	32.23	50.82		

Performance of Prometryn on Transplanted Leek - IR4 - Schreur - 2018

Pest Code	CEPR					COPU					LACG					RRPW					LEEK				
Crop Code	23Jul18					23Jul18					23Jul18					23Jul18					06Sep18				
Rating Date	RATING					RATING					RATING					RATING					RATING				
Rating Type	1-10					1-10					1-10					1-10					1-10				
Rating Unit	1-10					1-10					1-10					1-10					1-10				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Rate Unit	Growth Stage																			
1	Untreated Weed-Free						8.0	3.3	9.3	4.7	1.7														
2	Caparol	4 L		1.6 lb ai/a		PO1,PO2	10.0	3.3	9.0	8.3	2.3														
3	Caparol	4 L		3.2 lb ai/a		PO1,PO2	8.7	5.7	8.3	5.7	2.0														
4	Caparol	4 L		1.6 lb ai/a		PO1,PO2	10.0	7.3	10.0	6.7	1.7														
	Prowl H20	3.8 CS		1.9 lb ai/a		PO1,PO2																			
5	Prowl H20	3.8 CS		1.9 lb ai/a		PO1,PO2	8.0	8.0	10.0	6.0	2.3														
6	Outlook	6 EC		0.98 lb ai/a		PO1,PO2	7.3	6.3	10.0	6.7	1.7														
7	Dual Magnum	7.62 EC		1.26 lb ai/a		PO1,PO2	7.7	8.0	10.0	4.0	1.3														
LSD P=.05							3.05	3.30	1.49	3.20	1.43														
Standard Deviation							1.72	1.86	0.84	1.80	0.80														
CV							20.13	30.93	8.77	29.95	43.17														

Pest Code						LEEK					LEEK														
Crop Code						06Sep18					06Sep18														
Rating Date						HARVEST					HARVEST														
Rating Type						NO./PLOT					KG/PLOT														
Rating Unit																									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Rate Unit	Growth Stage																			
1	Untreated Weed-Free						101.3	53.4900																	
2	Caparol	4 L		1.6 lb ai/a		PO1,PO2	101.7	50.2283																	
3	Caparol	4 L		3.2 lb ai/a		PO1,PO2	100.7	48.8400																	
4	Caparol	4 L		1.6 lb ai/a		PO1,PO2	102.0	49.7483																	
	Prowl H20	3.8 CS		1.9 lb ai/a		PO1,PO2																			
5	Prowl H20	3.8 CS		1.9 lb ai/a		PO1,PO2	101.7	51.1243																	
6	Outlook	6 EC		0.98 lb ai/a		PO1,PO2	107.7	56.7433																	
7	Dual Magnum	7.62 EC		1.26 lb ai/a		PO1,PO2	106.3	59.8350																	
LSD P=.05							16.56	10.14432																	
Standard Deviation							9.31	5.70179																	
CV							9.03	10.79																	

Weed Control in Lettuce - Imlay City - 2018

Project Code: 116-18-1

Location: Imlay City, MI

Personnel: Bernard H. Zandstra, Nicole Soldan

Crop: Head Lettuce

Variety: 7101A Iceberg

Planting Method:

Planting Date: 5/21/18

Harvest Date: 7/16/18

Spacing: 12 inches

Row Spacing: 12 inches; 2 rows/bed

Tillage Type: Conventional

Study Design: RCB

Replications: 3

Plot Size: 2.7 ft wide x 30 ft long

Soil Type: Carlisle muck

OM: 75.6%

pH: 5.6

Sand: 10%

Silt: 12%

Clay: 2%

CEC: N/A

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	5/22	10:30 AM	59/57	F	Damp	4-5 SW	82	100% Cloudy	Y
PO1	6/6	2:40 PM	69/63	F	Dry	3-4 NE	32	0% Cloudy	N

Crop and Weed Information at Application

Date	Crop	Height or Diameter	Growth Stage	Density
5/22	Lettuce		Preemergence	
5/22	No weeds			
6/6	Lettuce	1-2"		Good
6/6	COPU = Common Purslane	0.5-1"	2-5 LS	Many

Notes and Comments

1. Spray applied with 2 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
 2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
 3. PO1 = 2-3 LS
 4. Harvested 10 feet per plot.
-

Weed Control in Lettuce - Imlay City - 2018

Michigan State University

Weed Control in Lettuce - Imlay City - 2018

Trial ID: 116-18-1
Protocol ID: 116-18-1

Location: Imlay City, MI
Investigator: Dr. Bernard Zandstra

Trial Year: 2018

Pest Code	COPU		COPU		LETTUCE	LETTUCE
	LETTUCE	LETTUCE	LETTUCE	LETTUCE		
Crop Code	06Jun18	06Jun18	22Jun18	22Jun18	16Jul18	16Jul18
Rating Date	RATING	RATING	RATING	RATING	HARVEST	HARVEST
Rating Type	1-10	1-10	1-10	1-10	NO./PLOT	KG/PLOT
Rating Unit	Form Form		Rate	Growth		
Trt No.	Treatment Name	Conc	Type	Rate	Unit	Stage
1	Kerb	50	WP	4 lb ai/a	PRE	1.7 7.3 1.3 7.0 20.3 11.9067
2	Kerb	50	WP	6 lb ai/a	PRE	1.7 7.7 2.0 7.0 19.0 11.1400
3	Spartan	4	F	0.125 lb ai/a	PRE	1.3 5.3 1.7 7.0 18.3 9.9333
4	Spartan	4	F	0.25 lb ai/a	PRE	3.7 6.0 2.7 6.7 16.7 8.8533
5	Kerb	50	WP	4 lb ai/a	PRE	1.0 7.7 5.0 10.0 8.7 2.1300
	Prowl H20	3.8	CS	1.9 lb ai/a	PO1	
6	Kerb	50	WP	4 lb ai/a	PRE	1.3 7.3 1.0 8.3 19.3 10.7300
	Dual Magnum	7.62	EC	1.9 lb ai/a	PO1	
7	Kerb	50	WP	3 lb ai/a	PRE	1.3 7.3 1.7 8.3 20.0 11.0900
	Kerb	50	WP	3 lb ai/a	PO1	
8	Untreated					1.0 1.0 1.3 4.0 18.0 9.6767
	LSD P=.05					1.07 0.90 1.46 2.56 5.43 2.94360
	Standard Deviation					0.61 0.51 0.83 1.46 3.10 1.68073
	CV					37.68 8.24 40.06 20.05 17.69 17.82

Weed Control in Mint with Saflufenacil - Irrer - 2018

Project Code: 121-18-1

Location: St. Johns, MI

Personnel: Bernard H. Zandstra, Nicole Soldan
 Crop: Spearmint Variety: Native Spearmint
 Planting Method: Roots Planting Date: 2014
 Spacing: Meadow Row Spacing: Solid
 Tillage Type: Conventional Study Design: RCB Replications: 3
 Plot Size: 6 ft wide x 30 ft long

Soil Type: Capac Loam OM: 4.0% pH: 5.9
 Sand: 36% Silt: 40% Clay: 24% CEC: 12.6

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	4/20	1:25 PM	58/44	F	Moist	6-9 NW	20	0% Cloudy	N
DPRE	5/1	9:00 AM	65/60	F	Dry	11-12 SW	33	0% Cloudy	N
PO1	5/16	2:50 PM	84/68	F	Damp	2-3 SW	37	0% Cloudy	N
PO2	5/29	2:15 PM	88/74	F	Dry	7-8 SE	60	35% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/20	Mint		Dormant	
4/20	No Weeds			
5/1	Mint	0.5-1"	Early foliar	Good
5/1	No Weeds			
5/16	Mint	3-5"	Veg	Good
5/16	No Weeds			
5/29	Mint	12-18"	Veg	Good
5/29	CATH = Canada Thistle	6-15"	Veg	Few

Notes and Comments

1. Spray applied with 4 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
3. PRE = dormant; DPRE = Few emerged plants; PO1 = 2 weeks after DPRE; PO2 = 4 weeks after DPRE
4. There were too few weeds in the field for evaluation.

Weed Control in Mint with Saflufenacil - Irrer - 2018

Michigan State University

Weed Control in Mint with Saflufenacil - Irrer - 2018

Trial ID: 121-18-1 Location: St. John's, MI Trial Year: 2018
 Protocol ID: 121-18-1 Investigator: Dr. Bernard Zandstra

Crop Code				MINT	MINT	MINT		
Rating Date				16May18	29May18	21Jun18		
Rating Type				RATING	RATING	RATING		
Rating Unit				1-10	1-10	1-10		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Growth Stage			
1	Untreated				PRE	1.0	1.0	1.3
2	Sinbar	80	WDG	1 lb ai/a	PRE	2.3	1.7	1.7
	GoalTender	4	SC	0.5 lb ai/a	PRE			
	Gramoxone SL	2	SL	0.5 lb ai/a	PRE			
3	Sharpen	2.85	SC	0.045 lb ai/a	PRE	2.3	1.7	1.7
	MSO	100	SL	1 % v/v	PRE			
	N Pak (AMS)	100	L	2 % v/v	PRE			
4	Sharpen	2.85	SC	0.09 lb ai/a	PRE	3.3	2.7	2.0
	MSO	100	SL	1 % v/v	PRE			
	N Pak (AMS)	100	L	2 % v/v	PRE			
5	Sharpen	2.85	SC	0.135 lb ai/a	PRE	4.0	3.3	2.3
	MSO	100	SL	1 % v/v	PRE			
	N Pak (AMS)	100	L	2 % v/v	PRE			
6	Sharpen	2.85	SC	0.045 lb ai/a	PRE	2.3	1.7	1.3
	Spartan	4	F	0.375 lb ai/a	PRE			
	MSO	100	SL	1 % v/v	PRE			
	N Pak (AMS)	100	L	2 % v/v	PRE			
7	Sharpen	2.85	SC	0.045 lb ai/a	PRE	4.7	2.7	2.0
	Chateau SW	51	WDG	0.128 lb ai/a	PRE			
	MSO	100	SL	1 % v/v	PRE			
	N Pak (AMS)	100	L	2 % v/v	PRE			
8	Sharpen	2.85	SC	0.045 lb ai/a	PRE	2.3	1.7	1.3
	Zidua	85	WDG	0.09 lb ai/a	PRE			
9	Sharpen	2.85	SC	0.045 lb ai/a	DPRE	7.3	5.3	3.0
	MSO	100	SL	1 % v/v	DPRE			
	N Pak (AMS)	100	L	2 % v/v	DPRE			
10	Sharpen	2.85	SC	0.045 lb ai/a	PO1	1.0	8.3	6.0
	MSO	100	SL	1 % v/v	PO1			
	N Pak (AMS)	100	L	2 % v/v	PO1			
11	Sharpen	2.85	SC	0.045 lb ai/a	PO2	1.0	1.0	4.7
	MSO	100	SL	1 % v/v	PO2			
	N Pak (AMS)	100	L	2 % v/v	PO2			
12	Tough	5	EC	0.94 lb ai/a	PO2		1.0	1.3
	NIS	100	SL	0.25 % v/v	PO2			
	LSD P=.05					1.25	0.71	0.95
	Standard Deviation					0.73	0.42	0.56
	CV					25.51	15.65	23.52

Preemergence Weed Control in Onion - Muck Soil - Keilen - 2018

Project Code: 112-18-1

Location: East Lansing, MI

Personnel: Bernard H. Zandstra, Nicole Soldan
 Crop: Onion Variety: LaSalle
 Planting Method: Seeded Planting Date: 4/13/18 Harvest Date: 8/16/18
 Spacing: 1 in Row Spacing: 10" 2 rows/plot
 Tillage Type: Conventional Study Design: RCB Replications: 3
 Plot Size: 2.7 ft wide x 30 ft long

Soil Type: Houghton Muck OM: 71.7% pH: 6.2
 Sand: 13% Silt: 14% Clay: 1% CEC: N/A

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
DPRE	5/5/18	10:00 AM	66/57	F	Moist	7-8	60	5% Cloudy	N
PO1	5/22/18	9:30 AM	65/54	F	Wet	0-2	80	100% Cloudy	Y
PO2	5/31/18	11:00 AM	83/74	F	Wet	1-7	62	10% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/5	Onion	1-2"	Loop;<5% flag	40-50% ap
5/5	BARL = Barley	1-3"	Veg	Many
5/5	COLQ = Lambsquarters	<1"	Cotyledon	Few
5/5	LATH = Ladysthumb	<1"	Cotyledon	Many
5/5	RRPW = Redroot Pigweed	<1"	Cotyledon	Few
5/22	Onion	3-4" 1 L	PO1 Veg	Good
5/22	HANS = Hairy Nightshade	1"/2-4" untrt.	Veg	Many
5/22	LATH = Ladysthumb	1"/2-4" untrt.	Veg	Many
5/31	Onion	4-5"	2-3 LS	Good
5/31	HANS = Hairy Nightshade	1-2" /6" untrt.	4-6 LS	Many
5/31	LATH = Ladysthumb	Cotyl./6" untrt.	6-8 LS	Many
5/31	YENS = Yellow Nutsedge	6"	Veg	Few

Notes and Comments

1. Spray applied with 2 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
3. DPRE = 10-14 DAS; PO1 = 1 LS; PO2 = 2 LS
4. Maintain POST weed control with GoalTender (0.125 lb ai) and Select Max (0.125 lb ai)

**Preemergence Weed Control in Onion - Muck Soil
- Keilen - 2018**

Michigan State University

Preemergence Weed Control in Onion - Muck - Keilen - 2018

Trial ID: 112-18-1
Protocol ID: 112-18-1

Location: East Lansing, MI
Investigator: Dr. Bernard Zandstra

Trial Year: 2018

Pest Code	Crop Code	Rating Date	Rating Type	Rating Unit	BARLEY		LATH	ONION		HANS	LATH
					ONION	ONION	ONION	ONION	ONION	ONION	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage	16May18 RATING 1-10	16May18 RATING 1-10	16May18 RATING 1-10	21May18 RATING 1-10	21May18 RATING 1-10	21May18 RATING 1-10
1	Zidua	85	WDG	0.133 lb ai/a	DPRE	1.3	1.3	7.0	1.3	6.3	6.7
	Buctril	2	EC	0.125 lb ai/a	DPRE						
	Prowl H2O	3.8	CS	1.9 lb ai/a	PO1,2						
2	Zidua	85	WDG	0.186 lb ai/a	DPRE	1.7	1.3	6.3	1.3	6.7	6.7
	Buctril	2	EC	0.125 lb ai/a	DPRE						
	Prowl H2O	3.8	CS	1.9 lb ai/a	PO1,2						
3	Zidua	85	WDG	0.267 lb ai/a	DPRE	1.7	1.0	5.7	2.3	8.7	8.7
	Buctril	2	EC	0.125 lb ai/a	DPRE						
	Prowl H2O	3.8	CS	1.9 lb ai/a	PO1,2						
4	Prowl H2O	3.8	CS	1.9 lb ai/a	DPRE	1.0	1.0	6.3	1.0	6.3	6.3
	Buctril	2	EC	0.125 lb ai/a	DPRE						
	Prowl H2O	3.8	CS	1.9 lb ai/a	PO1,2						
5	Handweeded					1.0	1.0	1.0	1.0	1.0	1.0
6	Prowl H2O	3.8	CS	1.9 lb ai/a	DPRE, PO2	1.0	1.0	5.3	1.0	6.3	6.3
	Buctril	2	EC	0.125 lb ai/a	DPRE						
	Zidua	85	WDG	0.133 lb ai/a	PO1						
7	Prowl H2O	3.8	CS	1.9 lb ai/a	DPRE, PO2	1.3	1.3	6.7	1.0	6.3	6.3
	Buctril	2	EC	0.125 lb ai/a	DPRE						
	Zidua	85	WDG	0.186 lb ai/a	PO1						
8	Prowl H2O	3.8	CS	1.9 lb ai/a	DPRE, PO2	1.7	1.0	6.7	1.0	6.0	6.3
	Buctril	2	EC	0.125 lb ai/a	DPRE						
	Zidua	85	WDG	0.267 lb ai/a	PO1						
9	Prowl H2O	3.8	CS	1.9 lb ai/a	DPRE, PO1,2	3.0	3.0	7.3	2.7	8.3	8.3
	Buctril	2	EC	0.125 lb ai/a	DPRE						
	Chateau SW	51	WDG	0.032 lb ai/a	DPRE, PO1,2						
10	Prowl H2O	3.8	CS	1.9 lb ai/a	DPRE, PO1	1.3	1.0	7.3	1.0	6.7	6.7
	Buctril	2	EC	0.125 lb ai/a	DPRE						
	Zidua	85	WDG	0.133 lb ai/a	PO2						
11	Prowl H2O	3.8	CS	1.9 lb ai/a	DPRE, PO1	1.0	1.0	6.0	1.0	6.0	6.0
	Buctril	2	EC	0.125 lb ai/a	DPRE						
	Zidua	85	WDG	0.186 lb ai/a	PO2						
12	Prowl H2O	3.8	CS	1.9 lb ai/a	DPRE, PO1	1.3	1.0	7.7	1.0	7.0	7.0
	Buctril	2	EC	0.125 lb ai/a	DPRE						
	Zidua	85	WDG	0.267 lb ai/a	PO2						
13	Prowl H2O	3.8	CS	1.9 lb ai/a	DPRE, PO1,2	1.3	1.3	6.7	1.7	6.3	6.3
	Buctril	2	EC	0.125 lb ai/a	DPRE						
	BIR	1.67	SL	0.033 lb ai/a	PO1,2						
14	Prowl H2O	3.8	CS	1.9 lb ai/a	DPRE	1.0	1.3	6.3	1.0	5.7	5.7
	Buctril	2	EC	0.125 lb ai/a	DPRE						
	BIR	1.67	SL	0.045 lb ai/a	PO1,2						
	LSD P=.05					0.96	0.60	2.97	0.60	1.92	1.95
	Standard Deviation					0.57	0.36	1.77	0.36	1.14	1.16
	CV					40.87	28.17	28.7	27.15	18.24	18.39

Preemergence Weed Control in Onion - Muck Soil - Keilen - 2018

Pest Code						HANS	LATH			HANS	LATH
Crop Code						ONION		ONION			
Rating Date						31May18	31May18	31May18	05Jun18	05Jun18	05Jun18
Rating Type						RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit						1-10	1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage						
1	Zidua	85 WDG		0.133 lb ai/a	DPRE	1.3	10.0	9.0	1.7	10.0	9.0
	Buctril	2 EC		0.125 lb ai/a	DPRE						
	Prowl H20	3.8 CS		1.9 lb ai/a	PO1,2						
2	Zidua	85 WDG		0.186 lb ai/a	DPRE	2.3	9.3	8.3	2.3	7.7	7.7
	Buctril	2 EC		0.125 lb ai/a	DPRE						
	Prowl H20	3.8 CS		1.9 lb ai/a	PO1,2						
3	Zidua	85 WDG		0.267 lb ai/a	DPRE	3.0	10.0	10.0	2.3	10.0	10.0
	Buctril	2 EC		0.125 lb ai/a	DPRE						
	Prowl H20	3.8 CS		1.9 lb ai/a	PO1,2						
4	Prowl H20	3.8 CS		1.9 lb ai/a	DPRE	1.0	10.0	8.7	1.0	10.0	8.7
	Buctril	2 EC		0.125 lb ai/a	DPRE						
	Prowl H20	3.8 CS		1.9 lb ai/a	PO1,2						
5	Handweeded					1.0	1.0	1.0	2.0	1.0	1.0
6	Prowl H20	3.8 CS		1.9 lb ai/a	DPRE, PO2	1.3	10.0	10.0	1.0	10.0	9.0
	Buctril	2 EC		0.125 lb ai/a	DPRE						
	Zidua	85 WDG		0.133 lb ai/a	PO1						
7	Prowl H20	3.8 CS		1.9 lb ai/a	DPRE, PO2	2.0	10.0	9.7	1.3	10.0	10.0
	Buctril	2 EC		0.125 lb ai/a	DPRE						
	Zidua	85 WDG		0.186 lb ai/a	PO1						
8	Prowl H20	3.8 CS		1.9 lb ai/a	DPRE, PO2	1.7	10.0	10.0	1.7	10.0	10.0
	Buctril	2 EC		0.125 lb ai/a	DPRE						
	Zidua	85 WDG		0.267 lb ai/a	PO1						
9	Prowl H20	3.8 CS		1.9 lb ai/a	DPRE, PO1,2	2.7	10.0	10.0	3.0	10.0	10.0
	Buctril	2 EC		0.125 lb ai/a	DPRE						
	Chateau SW	51 WDG		0.032 lb ai/a	DPRE, PO1,2						
10	Prowl H20	3.8 CS		1.9 lb ai/a	DPRE, PO1	1.3	10.0	9.0	1.3	10.0	9.3
	Buctril	2 EC		0.125 lb ai/a	DPRE						
	Zidua	85 WDG		0.133 lb ai/a	PO2						
11	Prowl H20	3.8 CS		1.9 lb ai/a	DPRE, PO1	1.0	10.0	9.7	1.3	9.7	9.7
	Buctril	2 EC		0.125 lb ai/a	DPRE						
	Zidua	85 WDG		0.186 lb ai/a	PO2						
12	Prowl H20	3.8 CS		1.9 lb ai/a	DPRE, PO1	1.3	10.0	9.3	1.3	10.0	9.3
	Buctril	2 EC		0.125 lb ai/a	DPRE						
	Zidua	85 WDG		0.267 lb ai/a	PO2						
13	Prowl H20	3.8 CS		1.9 lb ai/a	DPRE, PO1,2	1.7	10.0	10.0	1.7	10.0	10.0
	Buctril	2 EC		0.125 lb ai/a	DPRE						
	BIR	1.67 SL		0.033 lb ai/a	PO1,2						
14	Prowl H20	3.8 CS		1.9 lb ai/a	DPRE	1.7	9.7	9.7	1.7	10.0	10.0
	Buctril	2 EC		0.125 lb ai/a	DPRE						
	BIR	1.67 SL		0.045 lb ai/a	PO1,2						
LSD P=.05						0.80	0.59	1.60	0.89	1.84	2.06
Standard Deviation						0.48	0.35	0.95	0.53	1.10	1.23
CV						28.71	3.77	10.74	31.42	11.97	13.92

Preemergence Weed Control in Onion - Muck Soil - Keilen - 2018

Pest Code						HANS		LATH		HANS		LATH	
Crop Code						ONION		ONION		ONION		ONION	
Rating Date						15Jun18	15Jun18	15Jun18	05Jul18	05Jul18	05Jul18	05Jul18	05Jul18
Rating Type						RATING	RATING	RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit						1-10	1-10	1-10	1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage								
1	Zidua	85 WDG		0.133 lb ai/a	DPRE	1.7	10.0	8.7	1.7	10.0	9.7		
	Buctril	2 EC		0.125 lb ai/a	DPRE								
	Prowl H2O	3.8 CS		1.9 lb ai/a	PO1,2								
2	Zidua	85 WDG		0.186 lb ai/a	DPRE	2.3	10.0	8.3	1.7	7.7	10.0		
	Buctril	2 EC		0.125 lb ai/a	DPRE								
	Prowl H2O	3.8 CS		1.9 lb ai/a	PO1,2								
3	Zidua	85 WDG		0.267 lb ai/a	DPRE	2.7	10.0	9.0	2.7	10.0	10.0		
	Buctril	2 EC		0.125 lb ai/a	DPRE								
	Prowl H2O	3.8 CS		1.9 lb ai/a	PO1,2								
4	Prowl H2O	3.8 CS		1.9 lb ai/a	DPRE	1.0	10.0	9.3	1.3	8.3	10.0		
	Buctril	2 EC		0.125 lb ai/a	DPRE								
	Prowl H2O	3.8 CS		1.9 lb ai/a	PO1,2								
5	Handweeded					2.7	8.0	6.3	3.0	8.7	9.0		
6	Prowl H2O	3.8 CS		1.9 lb ai/a	DPRE, PO2	1.0	10.0	8.7	1.7	9.3	9.3		
	Buctril	2 EC		0.125 lb ai/a	DPRE								
	Zidua	85 WDG		0.133 lb ai/a	PO1								
7	Prowl H2O	3.8 CS		1.9 lb ai/a	DPRE, PO2	1.0	9.7	10.0	1.0	9.7	9.7		
	Buctril	2 EC		0.125 lb ai/a	DPRE								
	Zidua	85 WDG		0.186 lb ai/a	PO1								
8	Prowl H2O	3.8 CS		1.9 lb ai/a	DPRE, PO2	1.7	10.0	10.0	1.3	9.3	10.0		
	Buctril	2 EC		0.125 lb ai/a	DPRE								
	Zidua	85 WDG		0.267 lb ai/a	PO1								
9	Prowl H2O	3.8 CS		1.9 lb ai/a	DPRE, PO1,2	2.7	10.0	10.0	2.0	9.0	10.0		
	Buctril	2 EC		0.125 lb ai/a	DPRE								
	Chateau SW	51 WDG		0.032 lb ai/a	DPRE, PO1,2								
10	Prowl H2O	3.8 CS		1.9 lb ai/a	DPRE, PO1	1.0	10.0	9.3	1.0	10.0	9.7		
	Buctril	2 EC		0.125 lb ai/a	DPRE								
	Zidua	85 WDG		0.133 lb ai/a	PO2								
11	Prowl H2O	3.8 CS		1.9 lb ai/a	DPRE, PO1	2.3	10.0	9.7	1.0	6.7	6.7		
	Buctril	2 EC		0.125 lb ai/a	DPRE								
	Zidua	85 WDG		0.186 lb ai/a	PO2								
12	Prowl H2O	3.8 CS		1.9 lb ai/a	DPRE, PO1	2.0	10.0	9.3	1.3	10.0	10.0		
	Buctril	2 EC		0.125 lb ai/a	DPRE								
	Zidua	85 WDG		0.267 lb ai/a	PO2								
13	Prowl H2O	3.8 CS		1.9 lb ai/a	DPRE, PO1,2	2.0	10.0	10.0	1.7	10.0	10.0		
	Buctril	2 EC		0.125 lb ai/a	DPRE								
	BIR	1.67 SL		0.033 lb ai/a	PO1,2								
14	Prowl H2O	3.8 CS		1.9 lb ai/a	DPRE	1.0	10.0	10.0	1.3	9.0	9.3		
	Buctril	2 EC		0.125 lb ai/a	DPRE								
	BIR	1.67 SL		0.045 lb ai/a	PO1,2								
LSD P=.05						0.89	0.81	1.28	1.02	3.17	2.29		
Standard Deviation						0.53	0.48	0.76	0.61	1.89	1.37		
CV						29.84	4.9	8.26	37.66	20.73	14.34		

Preemergence Weed Control in Onion - Muck Soil - Keilen - 2018

Pest Code				RRPW		ONION	
Crop Code				05Jul18	16Aug18		
Rating Date				RATING		HARVEST	
Rating Type				1-10		KG/PLOT	
Rating Unit							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Growth Stage		
1	Zidua	85	WDG	0.133 lb ai/a	DPRE	8.0	71.05
	Buctril	2	EC	0.125 lb ai/a	DPRE		
	Prowl H20	3.8	CS	1.9 lb ai/a	PO1,2		
2	Zidua	85	WDG	0.186 lb ai/a	DPRE	7.7	64.07
	Buctril	2	EC	0.125 lb ai/a	DPRE		
	Prowl H20	3.8	CS	1.9 lb ai/a	PO1,2		
3	Zidua	85	WDG	0.267 lb ai/a	DPRE	9.0	65.58
	Buctril	2	EC	0.125 lb ai/a	DPRE		
	Prowl H20	3.8	CS	1.9 lb ai/a	PO1,2		
4	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE	7.7	73.54
	Buctril	2	EC	0.125 lb ai/a	DPRE		
	Prowl H20	3.8	CS	1.9 lb ai/a	PO1,2		
5	Handweeded					7.3	67.12
6	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE, PO2	7.7	70.07
	Buctril	2	EC	0.125 lb ai/a	DPRE		
	Zidua	85	WDG	0.133 lb ai/a	PO1		
7	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE, PO2	9.0	74.03
	Buctril	2	EC	0.125 lb ai/a	DPRE		
	Zidua	85	WDG	0.186 lb ai/a	PO1		
8	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE, PO2	8.7	60.74
	Buctril	2	EC	0.125 lb ai/a	DPRE		
	Zidua	85	WDG	0.267 lb ai/a	PO1		
9	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE, PO1,2	7.3	68.53
	Buctril	2	EC	0.125 lb ai/a	DPRE		
	Chateau SW	51	WDG	0.032 lb ai/a	DPRE, PO1,2		
10	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE, PO1	9.7	76.29
	Buctril	2	EC	0.125 lb ai/a	DPRE		
	Zidua	85	WDG	0.133 lb ai/a	PO2		
11	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE, PO1	6.7	75.22
	Buctril	2	EC	0.125 lb ai/a	DPRE		
	Zidua	85	WDG	0.186 lb ai/a	PO2		
12	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE, PO1	9.3	75.61
	Buctril	2	EC	0.125 lb ai/a	DPRE		
	Zidua	85	WDG	0.267 lb ai/a	PO2		
13	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE, PO1,2	9.0	68.87
	Buctril	2	EC	0.125 lb ai/a	DPRE		
	BIR	1.67	SL	0.033 lb ai/a	PO1,2		
14	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE	8.3	62.07
	Buctril	2	EC	0.125 lb ai/a	DPRE		
	BIR	1.67	SL	0.045 lb ai/a	PO1,2		
LSD P=.05						3.48	22.15
Standard Deviation						2.07	13.19
CV						25.13	18.98

Preemergence and Postemergence Weed Control in Onion with Bicyclopyrone - Keilen - 2018

Project Code: 112-18-2

Location: East Lansing, MI

Personnel: Bernard H. Zandstra, Nicole Soldan
 Crop: Onion Variety: LaSalle
 Planting Method: Seeded Planting Date: 4/13/18 Harvest Date: 8/16/18
 Spacing: 1 inch Row Spacing: 10 in, 2 rows/plot
 Tillage Type: Conventional Study Design: RCB Replications: 3
 Plot Size: 2.7 ft wide x 30 ft long

Soil Type: Houghton Muck OM: 71.7% pH: 6.2
 Sand: 13% Silt: 14% Clay: 1% CEC: N/A

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	4/20/18	9:40 AM	41/40	F	Moist	3-5	48	0% Cloudy	N
DPRE	5/5/18	9:40 AM	66/57	F	Moist	7-8	60	5% Cloudy	N
PO1	5/22/18	10:00 AM	62/54	F	Wet	1-2	80	100% Cloudy	Y
PO2	5/31/18	12:00 PM	83/74	F	Wet	1-7	62	20% Cloudy	N
PO3	6/7/18	2:30 PM	83/70	F	Dry	2-4	32	40% Cloudy	N
PO4	6/19/18	2:40 PM	76/70	F	Damp	4	63	100% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/20	Onion	NA	Preemergence	None
4/20	No weeds			
5/5	Barley	1-3"	Veg	Many
5/5	COLQ = Common Lambsquarters	4"	Cotyledon	Few
5/5	LATH = Ladysthumb	<1"	Cotyledon	Many
5/5	RRPW = Redroot Pigweed	<1"	Cotyledon	Few
5/22	Onion	3-4"	1 LS	Good
5/22	HANS = Hairy Nightshade	1"/2-4" untrt.	Veg	Many
5/22	LATH = Ladysthumb	1"/1-4" untrt.	Veg	Many
5/31	Onion	1-3"/6" Untrt/	2-3 LS	Many
5/31	HANS = Hairy Nightshade	1-3"/1-4" untrt.	Cotyl.; Veg	Many
5/31	LATH = ladysthumb	1"/2-4" untrt.	Veg	Many
6/7	Onion	5-6"	4-5 LS	Good
6/7	HANS = Hairy Nightshade	2-6"	Veg	Many
6/7	LATH = Ladysthumb	1-3"	Veg	Moderate
6/19	Onion		5-6 LS	
6/19	HANS = Hairy Nightshade	1-3"/4-6" untrt.	Veg	Moderate
6/19	LATH = Ladysthumb	3-4"/4-6 untrt.	Veg	Many
6/19	RRPW = Redroot Pigweed	1"	Veg	Moderate

Notes and Comments

1. Spray applied with 2 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
3. PRE = 1-2 DAS; DPRE = 10-14 DAS; PO1 = 1LS; PO2 = 2LS; PO3 = 3-4 LS; PO4 = 5-6 LS
4. BIR = Bicyclopyrone

Preemergence and Postemergence Weed Control in Onion with Bicyclopyrone - Keilen - 2018

Michigan State University

Preemergence & Postemergence Weed Control in Onion with Bicyclopyrone - Keilen - 2018

Trial ID: 112-18-2
Protocol ID: 112-18-2

Location: East Lansing
Investigator: Dr. Bernard Zandstra

Trial Year: 2018

Pest Code	Crop Code	Rating Date	Rating Type	Rating Unit	LATH		BARLEY		LATH		
					ONION	ONION	ONION	ONION	ONION	ONION	
					05May18	05May18	16May18	16May18	16May18	21May18	
					RATING	RATING	RATING	RATING	RATING	RATING	
					1-10	1-10	1-10	1-10	1-10	1-10	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Unit	Growth Stage					
1	Prowl H20	3.8	CS	1.9 lb ai/a	PRE, PO1, 2	1.0	4.3	1.0	1.0	2.7	1.7
	Buctril	2	EC	0.187 lb ai/a	PRE						
2	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE,PO1, 2	1.0	4.3	2.3	1.7	7.0	1.3
	Buctril	2	EC	0.125 lb ai/a	DPRE						
3	Prowl H20	3.8	CS	1.9 lb ai/a	PRE,PO1, 2	1.0	5.0	1.0	1.0	2.0	1.0
	BIR	1.67	SL	0.033 lb ai/a	PRE						
	Buctril	2	EC	0.187 lb ai/a	PRE						
4	Prowl H20	3.8	CS	1.9 lb ai/a	PRE,PO1, 2	1.0	5.0	1.3	1.0	3.7	1.0
	BIR	1.67	SL	0.045 lb ai/a	PRE						
	Buctril	2	EC	0.187 lb ai/a	PRE						
5	Prowl H20	3.8	CS	1.9 lb ai/a	PRE,PO1, 2	1.0	3.3	1.0	1.0	4.0	1.0
	BIR	1.67	SL	0.09 lb ai/a	PRE						
	Buctril	2	EC	0.187 lb ai/a	PRE						
6	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE,PO1, 2	1.0	4.7	2.3	1.7	7.0	2.7
	Buctril	2	EC	0.125 lb ai/a	DPRE						
	BIR	1.67	SL	0.033 lb ai/a	DPRE						
7	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE,PO1, 2	1.0	4.7	3.0	2.3	6.7	2.7
	Buctril	2	EC	0.125 lb ai/a	DPRE						
	BIR	1.67	SL	0.045 lb ai/a	DPRE						
8	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE,PO1, 2	1.0	3.0	2.7	2.7	6.3	3.0
	Buctril	2	EC	0.125 lb ai/a	DPRE						
	BIR	1.67	SL	0.09 lb ai/a	DPRE						
9	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE,PO1, 2	1.0	4.7	2.0	1.7	6.7	1.0
	Buctril	2	EC	0.125 lb ai/a	DPRE						
	GoalTender	4	SC	0.125 lb ai/a	PO1, 2, 3, 4						
10	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE,PO1, 2	1.0	4.7	2.0	1.7	6.7	1.7
	Buctril	2	EC	0.125 lb ai/a	DPRE						
	GoalTender	4	SC	0.125 lb ai/a	PO1, 2, 3, 4						
	BIR	1.67	SL	0.033 lb ai/a	PO1, 2, 3, 4						
11	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE,PO1, 2	1.0	3.0	2.0	1.7	6.0	1.3
	Buctril	2	EC	0.125 lb ai/a	DPRE						
	BIR	1.67	SL	0.045 lb ai/a	PO1, 2, 3, 4						
12	BIR	1.67	SL	0.033 lb ai/a	PO1	1.0	3.0	1.0	1.0	1.7	1.0
	NIS	100	SL	0.25 % v/v	PO1						
	GoalTender	4	SC	0.125 lb ai/a	PO2, 3, 4						
13	BIR	1.67	SL	0.045 lb ai/a	PO1	1.0	3.3	1.3	1.3	1.3	1.3
	NIS	100	SL	0.25 % v/v	PO1						
	GoalTender	4	SC	0.125 lb ai/a	PO2, 3, 4						
14	Untreated					1.0	4.7	1.3	1.0	1.7	1.0
	LSD P=.05					0.00	4.71	0.76	0.65	2.18	0.84
	Standard Deviation					0.00	2.80	0.45	0.39	1.30	0.50
	CV					0.0	68.09	26.17	26.09	28.65	32.25

Preemergence and Postemergence Weed Control in Onion with Bicyclopyrone - Keilen - 2018

Pest Code				HANS		LATH		HANS		LATH		
Crop Code						ONION				ONION		
Rating Date				21May18		21May18		31May18		05Jun18		
Rating Type				RATING		RATING		RATING		RATING		
Rating Unit				1-10		1-10		1-10		1-10		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Rate Unit	Growth Stage						
1	Prowl H20	3.8	CS	1.9 lb ai/a		PRE, PO1, 2	2.0	2.3	1.0	4.3	4.0	1.0
	Buctril	2	EC	0.187 lb ai/a		PRE						
2	Prowl H20	3.8	CS	1.9 lb ai/a		DPRE,PO1, 2	5.3	5.3	1.3	8.7	8.7	1.3
	Buctril	2	EC	0.125 lb ai/a		DPRE						
3	Prowl H20	3.8	CS	1.9 lb ai/a		PRE,PO1, 2	4.0	1.7	1.0	5.7	3.3	1.0
	BIR	1.67	SL	0.033 lb ai/a		PRE						
	Buctril	2	EC	0.187 lb ai/a		PRE						
4	Prowl H20	3.8	CS	1.9 lb ai/a		PRE,PO1, 2	5.0	5.0	1.0	5.7	4.3	1.0
	BIR	1.67	SL	0.045 lb ai/a		PRE						
	Buctril	2	EC	0.187 lb ai/a		PRE						
5	Prowl H20	3.8	CS	1.9 lb ai/a		PRE,PO1, 2	4.0	4.3	1.3	7.0	7.0	1.0
	BIR	1.67	SL	0.09 lb ai/a		PRE						
	Buctril	2	EC	0.187 lb ai/a		PRE						
6	Prowl H20	3.8	CS	1.9 lb ai/a		DPRE,PO1, 2	7.0	7.0	3.0	9.7	9.7	2.3
	Buctril	2	EC	0.125 lb ai/a		DPRE						
	BIR	1.67	SL	0.033 lb ai/a		DPRE						
7	Prowl H20	3.8	CS	1.9 lb ai/a		DPRE,PO1, 2	6.7	6.7	2.3	9.7	9.7	2.0
	Buctril	2	EC	0.125 lb ai/a		DPRE						
	BIR	1.67	SL	0.045 lb ai/a		DPRE						
8	Prowl H20	3.8	CS	1.9 lb ai/a		DPRE,PO1, 2	7.7	7.0	3.0	10.0	10.0	3.0
	Buctril	2	EC	0.125 lb ai/a		DPRE						
	BIR	1.67	SL	0.09 lb ai/a		DPRE						
9	Prowl H20	3.8	CS	1.9 lb ai/a		DPRE,PO1, 2	5.7	5.3	1.3	9.0	9.0	2.7
	Buctril	2	EC	0.125 lb ai/a		DPRE						
	GoalTender	4	SC	0.125 lb ai/a		PO1, 2, 3, 4						
10	Prowl H20	3.8	CS	1.9 lb ai/a		DPRE,PO1, 2	6.0	6.0	2.3	10.0	10.0	2.7
	Buctril	2	EC	0.125 lb ai/a		DPRE						
	GoalTender	4	SC	0.125 lb ai/a		PO1, 2, 3, 4						
	BIR	1.67	SL	0.033 lb ai/a		PO1, 2, 3, 4						
11	Prowl H20	3.8	CS	1.9 lb ai/a		DPRE,PO1, 2	5.7	5.7	1.3	7.7	7.7	1.0
	Buctril	2	EC	0.125 lb ai/a		DPRE						
	BIR	1.67	SL	0.045 lb ai/a		PO1, 2, 3, 4						
12	BIR	1.67	SL	0.033 lb ai/a		PO1	1.0	1.0	2.0	5.0	5.0	3.3
	NIS	100	SL	0.25 % v/v		PO1						
	GoalTender	4	SC	0.125 lb ai/a		PO2, 3, 4						
13	BIR	1.67	SL	0.045 lb ai/a		PO1	1.3	1.7	3.0	5.7	5.3	3.7
	NIS	100	SL	0.25 % v/v		PO1						
	GoalTender	4	SC	0.125 lb ai/a		PO2, 3, 4						
14	Untreated						1.3	1.3	1.0	1.7	1.0	2.0
LSD P=.05							2.02	1.65	0.80	2.79	1.79	0.77
Standard Deviation							1.21	0.98	0.47	1.66	1.06	0.46
CV							26.92	22.8	26.58	23.37	15.75	22.85

Preemergence and Postemergence Weed Control in Onion with Bicyclopyrone - Keilen - 2018

Pest Code					HANS	LATH		LATH		LATH		
Crop Code							ONION		ONION			
Rating Date					05Jun18	05Jun18	15Jun18	15Jun18	22Jun18	22Jun18		
Rating Type					RATING	RATING	RATING	RATING	RATING	RATING		
Rating Unit					1-10	1-10	1-10	1-10	1-10	1-10		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Growth Unit	Stage						
1	Prowl H20	3.8	CS	1.9 lb ai/a	PRE, PO1, 2		2.0	5.7	1.3	7.0	1.3	7.3
	Buctril	2	EC	0.187 lb ai/a	PRE							
2	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE,PO1, 2		10.0	10.0	1.0	9.0	1.0	9.0
	Buctril	2	EC	0.125 lb ai/a	DPRE							
3	Prowl H20	3.8	CS	1.9 lb ai/a	PRE,PO1, 2		3.0	3.7	1.0	8.0	1.3	7.0
	BIR	1.67	SL	0.033 lb ai/a	PRE							
	Buctril	2	EC	0.187 lb ai/a	PRE							
4	Prowl H20	3.8	CS	1.9 lb ai/a	PRE,PO1, 2		4.0	2.3	1.0	7.7	1.3	7.0
	BIR	1.67	SL	0.045 lb ai/a	PRE							
	Buctril	2	EC	0.187 lb ai/a	PRE							
5	Prowl H20	3.8	CS	1.9 lb ai/a	PRE,PO1, 2		5.3	7.7	1.0	8.7	1.7	7.7
	BIR	1.67	SL	0.09 lb ai/a	PRE							
	Buctril	2	EC	0.187 lb ai/a	PRE							
6	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE,PO1, 2		10.0	10.0	2.0	9.3	2.7	9.7
	Buctril	2	EC	0.125 lb ai/a	DPRE							
	BIR	1.67	SL	0.033 lb ai/a	DPRE							
7	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE,PO1, 2		10.0	9.3	1.7	9.3	2.0	9.3
	Buctril	2	EC	0.125 lb ai/a	DPRE							
	BIR	1.67	SL	0.045 lb ai/a	DPRE							
8	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE,PO1, 2		10.0	10.0	2.7	9.7	3.3	9.3
	Buctril	2	EC	0.125 lb ai/a	DPRE							
	BIR	1.67	SL	0.09 lb ai/a	DPRE							
9	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE,PO1, 2		9.3	10.0	2.0	10.0	1.0	10.0
	Buctril	2	EC	0.125 lb ai/a	DPRE							
	GoalTender	4	SC	0.125 lb ai/a	PO1, 2, 3, 4							
10	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE,PO1, 2		10.0	10.0	3.0	10.0	2.3	10.0
	Buctril	2	EC	0.125 lb ai/a	DPRE							
	GoalTender	4	SC	0.125 lb ai/a	PO1, 2, 3, 4							
	BIR	1.67	SL	0.033 lb ai/a	PO1, 2, 3, 4							
11	Prowl H20	3.8	CS	1.9 lb ai/a	DPRE,PO1, 2		10.0	10.0	1.0	10.0	1.7	10.0
	Buctril	2	EC	0.125 lb ai/a	DPRE							
	BIR	1.67	SL	0.045 lb ai/a	PO1, 2, 3, 4							
12	BIR	1.67	SL	0.033 lb ai/a	PO1		10.0	9.7	3.0	7.7	3.3	10.0
	NIS	100	SL	0.25 % v/v	PO1							
	GoalTender	4	SC	0.125 lb ai/a	PO2, 3, 4							
13	BIR	1.67	SL	0.045 lb ai/a	PO1		10.0	9.3	4.3	8.0	4.0	9.7
	NIS	100	SL	0.25 % v/v	PO1							
	GoalTender	4	SC	0.125 lb ai/a	PO2, 3, 4							
14	Untreated						6.0	8.3	2.0	7.7	2.7	6.3
	LSD P=.05						2.62	2.63	0.96	2.67	1.07	1.89
	Standard Deviation						1.56	1.56	0.57	1.59	0.63	1.13
	CV						19.94	18.88	29.69	18.24	29.96	12.9

Preemergence and Postemergence Weed Control in Onion with Bicyclopyrone - Keilen - 2018

Pest Code				RRPW		HANS		LATH		RRPW		
Crop Code				ONION		ONION		ONION		ONION		
Rating Date				22Jun18	05Jul18	05Jul18	05Jul18	05Jul18	05Jul18	16Aug18		
Rating Type				RATING	RATING	RATING	RATING	RATING	RATING	HARVEST		
Rating Unit				1-10	1-10	1-10	1-10	1-10	1-10	KG/PLOT		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage						
1	Prowl H20	3.8	CS	1.9 lb ai/a		PRE, PO1, 2	8.0	1.7	10.0	9.3	8.7	38.307
	Buctril	2	EC	0.187 lb ai/a		PRE						
2	Prowl H20	3.8	CS	1.9 lb ai/a		DPRE,PO1, 2	8.3	1.3	10.0	9.0	8.7	40.900
	Buctril	2	EC	0.125 lb ai/a		DPRE						
3	Prowl H20	3.8	CS	1.9 lb ai/a		PRE,PO1, 2	8.7	1.0	10.0	9.0	8.0	43.073
	BIR	1.67	SL	0.033 lb ai/a		PRE						
	Buctril	2	EC	0.187 lb ai/a		PRE						
4	Prowl H20	3.8	CS	1.9 lb ai/a		PRE,PO1, 2	7.3	1.3	8.7	9.3	7.3	40.207
	BIR	1.67	SL	0.045 lb ai/a		PRE						
	Buctril	2	EC	0.187 lb ai/a		PRE						
5	Prowl H20	3.8	CS	1.9 lb ai/a		PRE,PO1, 2	8.3	1.7	8.3	10.0	8.3	39.353
	BIR	1.67	SL	0.09 lb ai/a		PRE						
	Buctril	2	EC	0.187 lb ai/a		PRE						
6	Prowl H20	3.8	CS	1.9 lb ai/a		DPRE,PO1, 2	8.7	1.3	8.7	9.7	8.7	32.973
	Buctril	2	EC	0.125 lb ai/a		DPRE						
	BIR	1.67	SL	0.033 lb ai/a		DPRE						
7	Prowl H20	3.8	CS	1.9 lb ai/a		DPRE,PO1, 2	8.3	1.7	9.0	10.0	8.0	40.160
	Buctril	2	EC	0.125 lb ai/a		DPRE						
	BIR	1.67	SL	0.045 lb ai/a		DPRE						
8	Prowl H20	3.8	CS	1.9 lb ai/a		DPRE,PO1, 2	8.7	1.7	9.7	10.0	7.3	34.187
	Buctril	2	EC	0.125 lb ai/a		DPRE						
	BIR	1.67	SL	0.09 lb ai/a		DPRE						
9	Prowl H20	3.8	CS	1.9 lb ai/a		DPRE,PO1, 2	10.0	1.3	10.0	10.0	10.0	42.907
	Buctril	2	EC	0.125 lb ai/a		DPRE						
	GoalTender	4	SC	0.125 lb ai/a		PO1, 2, 3, 4						
10	Prowl H20	3.8	CS	1.9 lb ai/a		DPRE,PO1, 2	10.0	1.3	10.0	10.0	10.0	36.880
	Buctril	2	EC	0.125 lb ai/a		DPRE						
	GoalTender	4	SC	0.125 lb ai/a		PO1, 2, 3, 4						
	BIR	1.67	SL	0.033 lb ai/a		PO1, 2, 3, 4						
11	Prowl H20	3.8	CS	1.9 lb ai/a		DPRE,PO1, 2	9.7	1.0	10.0	10.0	10.0	35.847
	Buctril	2	EC	0.125 lb ai/a		DPRE						
	BIR	1.67	SL	0.045 lb ai/a		PO1, 2, 3, 4						
12	BIR	1.67	SL	0.033 lb ai/a		PO1	9.3	2.3	10.0	9.7	10.0	31.320
	NIS	100	SL	0.25 % v/v		PO1						
	GoalTender	4	SC	0.125 lb ai/a		PO2, 3, 4						
13	BIR	1.67	SL	0.045 lb ai/a		PO1	10.0	3.3	10.0	9.7	10.0	28.373
	NIS	100	SL	0.25 % v/v		PO1						
	GoalTender	4	SC	0.125 lb ai/a		PO2, 3, 4						
14	Untreated						7.0	2.0	7.3	8.3	8.0	28.887
LSD P=.05							1.63	1.00	1.21	1.58	1.36	13.0112
Standard Deviation							0.97	0.59	0.72	0.94	0.81	7.7507
CV							11.11	36.19	7.68	9.83	9.24	21.14

Preemergence Weed Control in Onion - Mineral Soil - HTRC - 2018

Project Code: 112-18-3

Location: East Lansing, MI

Personnel: Bernard H. Zandstra, Nicole Soldan
 Crop: Onion Variety: Highlander
 Planting Method: Seeded Planting Date: 7/9/18
 Spacing: 2 in Row Spacing: 14 inch; 3 rows/plot
 Tillage Type: Conventional Study Design: RCB Replications: 3
 Plot Size: 5.3 ft wide x 30 ft long

Soil Type: Marlette fine sandy loam OM: 1.2% pH: 6.3
 Sand: 69% Silt: 20% Clay: 11% CEC: 4.4

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
DPRE	7/18	1:30 PM	81/71	F	Dry	0-3 NE	35	35% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
7/18	Onion		Few just emerged	
7/18	BYGR = Barnyardgrass	1"	Veg	Many
7/18	COLQ = Common Lambsquarters	1"	Cotyledon	Moderate
7/18	RRPW = Redroot Pigweed	< 1"	Cotyledon	Many
	WIRA = Wild Radish			

Notes and Comments

1. Spray applied with 4 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
3. DPRE = 10-14 DAS
4. PO1 and PO2 applications not applied due to poor onion germination.

**Preemergence Weed Control in Onion - Mineral
Soil - HTRC - 2018**

Michigan State University

Preemergence Weed Control in Onion on Mineral Soil - HTRC - 2018

Trial ID: 112-18-3 Location: East Lansing, MI Trial Year: 2018
 Protocol ID: 112-18-3 Investigator: Dr. Bernard Zandstra

Pest Code	Crop Code	Rating Date	Rating Type	Rating Unit	ONION				
					BYGR 22Aug18 RATING 1-10	COPU 22Aug18 RATING 1-10	WIRA 22Aug18 RATING 1-10		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage				
1	Zidua	85 WDG		0.066 lb ai/a	DPRE	7.0	10.0	4.3	8.7
	Buctril	2 EC		0.187 lb ai/a	DPRE				
	Prowl H20	3.8 CS		0.95 lb ai/a	PO1,2				
2	Zidua	85 WDG		0.133 lb ai/a	DPRE	8.7	10.0	9.3	9.3
	Buctril	2 EC		0.187 lb ai/a	DPRE				
	Prowl H20	3.8 CS		0.95 lb ai/a	PO1,2				
3	Zidua	85 WDG		0.186 lb ai/a	DPRE	9.7	10.0	10.0	9.7
	Buctril	2 EC		0.187 lb ai/a	DPRE				
	Prowl H20	3.8 CS		0.95 lb ai/a	PO1,2				
4	Zidua	85 WDG		0.267 lb ai/a	DPRE	10.0	10.0	10.0	10.0
	Buctril	2 EC		0.187 lb ai/a	DPRE				
	Prowl H20	3.8 CS		0.95 lb ai/a	PO1,2				
5	Prowl H20	3.8 CS		0.95 lb ai/a	DPRE	7.3	9.7	10.0	9.7
	Buctril	2 EC		0.187 lb ai/a	DPRE				
	Prowl H20	3.8 CS		0.95 lb ai/a	PO1,2				
6	Prowl H20	3.8 CS		0.95 lb ai/a	DPRE	8.7	10.0	10.0	9.0
	Buctril	2 EC		0.187 lb ai/a	DPRE				
	Zidua	85 WDG		0.066 lb ai/a	PO1				
7	Prowl H20	3.8 CS		0.95 lb ai/a	DPRE	8.3	10.0	10.0	9.0
	Buctril	2 EC		0.187 lb ai/a	DPRE				
	Zidua	85 WDG		0.133 lb ai/a	PO1				
8	Prowl H20	3.8 CS		0.95 lb ai/a	DPRE	9.0	9.7	10.0	8.7
	Buctril	2 EC		0.187 lb ai/a	DPRE				
	Zidua	85 WDG		0.186 lb ai/a	PO1				
9	Prowl H20	3.8 CS		0.95 lb ai/a	DPRE	8.0	9.7	10.0	9.7
	Buctril	2 EC		0.187 lb ai/a	DPRE				
	Zidua	85 WDG		0.267 lb ai/a	PO1				
10	Prowl H20	3.8 CS		0.95 lb ai/a	DPRE	7.7	10.0	10.0	9.0
	Buctril	2 EC		0.187 lb ai/a	DPRE				
	Zidua	85 WDG		0.066 lb ai/a	PO2				
11	Prowl H20	3.8 CS		0.95 lb ai/a	DPRE	8.0	10.0	10.0	8.3
	Buctril	2 EC		0.187 lb ai/a	DPRE				
	Zidua	85 WDG		0.133 lb ai/a	PO2				
12	Prowl H20	3.8 CS		0.95 lb ai/a	DPRE	7.7	9.0	10.0	9.3
	Buctril	2 EC		0.187 lb ai/a	DPRE				
	Zidua	85 WDG		0.186 lb ai/a	PO2				
13	Prowl H20	3.8 CS		0.95 lb ai/a	DPRE	9.0	10.0	10.0	8.3
	Buctril	2 EC		0.187 lb ai/a	DPRE				
	Zidua	85 WDG		0.267 lb ai/a	PO2				
14	Handweeded					7.0	1.0	1.0	1.0
	LSD P=.05					1.97	0.65	1.05	1.31
	Standard Deviation					1.18	0.39	0.62	0.78

Weed Control in Onion – Mineral Soil – Vogel – 2018

Michigan State University

Weed Control in Onion on Mineral Soil - Vogel - 2018

Trial ID: 112-18-8
Protocol ID: 112-18-8

Location: Fremont, MI
Investigator: Dr. Bernard Zandstra

Trial Year: 2018

Pest Code	Crop Code	Rating Date	Rating Type	Rating Unit	BARLEY		CORW		COLQ		CORW	
					ONION	ONION	ONION	ONION	ONION	ONION		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage	18May18	18May18	18May18	01Jun18	01Jun18	01Jun18	06Jun18
				Unit		RATING	RATING	RATING	RATING	RATING	RATING	RATING
						1-10	1-10	1-10	1-10	1-10	1-10	1-10
1	Zidua	85	WDG	0.066 lb ai/a	DPRE	9.0	5.3	9.7	6.7	10.0	10.0	6.3
	Buctril	2	EC	0.187 lb ai/a	DPRE							
	Prowl H20	3.8	CS	0.95 lb ai/a	PO1,2							
2	Zidua	85	WDG	0.133 lb ai/a	DPRE	10.0	5.7	10.0	9.3	10.0	10.0	9.0
	Buctril	2	EC	0.187 lb ai/a	DPRE							
	Prowl H20	3.8	CS	0.95 lb ai/a	PO1,2							
3	Zidua	85	WDG	0.186 lb ai/a	DPRE	10.0	6.3	10.0	9.7	10.0	10.0	9.0
	Buctril	2	EC	0.187 lb ai/a	DPRE							
	Prowl H20	3.8	CS	0.95 lb ai/a	PO1,2							
4	Zidua	85	WDG	0.267 lb ai/a	DPRE	9.7	7.3	10.0	9.7	10.0	10.0	9.7
	Buctril	2	EC	0.187 lb ai/a	DPRE							
	Prowl H20	3.8	CS	0.95 lb ai/a	PO1,2							
5	Prowl H20	3.8	CS	0.95 lb ai/a	DPRE	2.3	1.7	8.3	1.3	10.0	9.7	2.3
	Buctril	2	EC	0.187 lb ai/a	DPRE							
	Prowl H20	3.8	CS	0.95 lb ai/a	PO1,2							
6	Prowl H20	3.8	CS	0.95 lb ai/a	DPRE	2.3	2.0	7.0	2.0	9.0	7.7	2.0
	Buctril	2	EC	0.187 lb ai/a	DPRE							
	Zidua	85	WDG	0.066 lb ai/a	PO1							
7	Prowl H20	3.8	CS	0.95 lb ai/a	DPRE	2.7	2.3	7.3	4.0	9.7	10.0	3.3
	Buctril	2	EC	0.187 lb ai/a	DPRE							
	Zidua	85	WDG	0.133 lb ai/a	PO1							
8	Prowl H20	3.8	CS	0.95 lb ai/a	DPRE	2.0	2.3	7.3	5.0	10.0	10.0	4.0
	Buctril	2	EC	0.187 lb ai/a	DPRE							
	Zidua	85	WDG	0.186 lb ai/a	PO1							
9	Prowl H20	3.8	CS	0.95 lb ai/a	DPRE	4.3	2.7	7.3	5.7	10.0	10.0	5.0
	Buctril	2	EC	0.187 lb ai/a	DPRE							
	Zidua	85	WDG	0.267 lb ai/a	PO1							
10	Prowl H20	3.8	CS	0.95 lb ai/a	DPRE	1.0	1.3	7.3	1.7	10.0	8.7	3.0
	Buctril	2	EC	0.187 lb ai/a	DPRE							
	Zidua	85	WDG	0.066 lb ai/a	PO2							
11	Prowl H20	3.8	CS	0.95 lb ai/a	DPRE	1.3	1.7	7.0	1.3	10.0	8.7	2.7
	Buctril	2	EC	0.187 lb ai/a	DPRE							
	Zidua	85	WDG	0.133 lb ai/a	PO2							
12	Prowl H20	3.8	CS	0.95 lb ai/a	DPRE	4.3	2.7	7.3	4.7	9.0	8.0	4.0
	Buctril	2	EC	0.187 lb ai/a	DPRE							
	Zidua	85	WDG	0.186 lb ai/a	PO2							
13	Prowl H20	3.8	CS	0.95 lb ai/a	DPRE	1.0	1.3	3.3	1.3	5.3	3.7	2.7
	Buctril	2	EC	0.187 lb ai/a	DPRE							
	Zidua	85	WDG	0.267 lb ai/a	PO2							
14	Handweeded					1.3	2.0	1.0	1.0	1.0	1.0	2.0
	LSD P=.05					2.40	1.90	2.12	2.47	2.39	1.67	2.61
	Standard Deviation					1.43	1.13	1.26	1.47	1.42	1.00	1.56
	CV					32.68	35.51	17.17	32.54	16.08	11.9	33.53

Weed Control in Onion - Mineral Soil - Vogel - 2018

Pest Code					COLQ	CORW		CORW	WHCL	YENS		
Crop Code							ONION				ONION	
Rating Date					06Jun18	06Jun18	05Jul18	05Jul18	05Jul18	05Jul18	07Aug18	
Rating Type					RATING	RATING	RATING	RATING	RATING	RATING	HARVEST	
Rating Unit					1-10	1-10	1-10	1-10	1-10	1-10	KG/PLOT	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage							
1	Zidua	85 WDG		0.066 lb ai/a	DPRE	10.0	9.7	4.3	9.3	7.5	8.9	30.88
	Buctril	2 EC		0.187 lb ai/a	DPRE							
	Prowl H20	3.8 CS		0.95 lb ai/a	PO1,2							
2	Zidua	85 WDG		0.133 lb ai/a	DPRE	10.0	10.0	6.7	9.8	8.5	8.9	8.57
	Buctril	2 EC		0.187 lb ai/a	DPRE							
	Prowl H20	3.8 CS		0.95 lb ai/a	PO1,2							
3	Zidua	85 WDG		0.186 lb ai/a	DPRE	10.0	10.0	8.0	9.3	8.5	9.4	5.83
	Buctril	2 EC		0.187 lb ai/a	DPRE							
	Prowl H20	3.8 CS		0.95 lb ai/a	PO1,2							
4	Zidua	85 WDG		0.267 lb ai/a	DPRE	10.0	10.0	8.3	9.7	9.0	8.7	2.53
	Buctril	2 EC		0.187 lb ai/a	DPRE							
	Prowl H20	3.8 CS		0.95 lb ai/a	PO1,2							
5	Prowl H20	3.8 CS		0.95 lb ai/a	DPRE	10.0	10.0	1.7	8.0	4.7	9.0	73.63
	Buctril	2 EC		0.187 lb ai/a	DPRE							
	Prowl H20	3.8 CS		0.95 lb ai/a	PO1,2							
6	Prowl H20	3.8 CS		0.95 lb ai/a	DPRE	10.0	7.0	1.3	4.7	2.7	7.0	70.05
	Buctril	2 EC		0.187 lb ai/a	DPRE							
	Zidua	85 WDG		0.066 lb ai/a	PO1							
7	Prowl H20	3.8 CS		0.95 lb ai/a	DPRE	9.3	9.3	2.3	9.3	3.0	9.0	46.05
	Buctril	2 EC		0.187 lb ai/a	DPRE							
	Zidua	85 WDG		0.133 lb ai/a	PO1							
8	Prowl H20	3.8 CS		0.95 lb ai/a	DPRE	8.7	10.0	3.0	8.3	4.3	9.3	43.67
	Buctril	2 EC		0.187 lb ai/a	DPRE							
	Zidua	85 WDG		0.186 lb ai/a	PO1							
9	Prowl H20	3.8 CS		0.95 lb ai/a	DPRE	10.0	10.0	4.3	9.3	4.3	8.7	26.86
	Buctril	2 EC		0.187 lb ai/a	DPRE							
	Zidua	85 WDG		0.267 lb ai/a	PO1							
10	Prowl H20	3.8 CS		0.95 lb ai/a	DPRE	10.0	9.0	1.7	7.7	6.0	8.3	66.97
	Buctril	2 EC		0.187 lb ai/a	DPRE							
	Zidua	85 WDG		0.066 lb ai/a	PO2							
11	Prowl H20	3.8 CS		0.95 lb ai/a	DPRE	10.0	10.0	1.7	8.3	4.3	8.7	58.91
	Buctril	2 EC		0.187 lb ai/a	DPRE							
	Zidua	85 WDG		0.133 lb ai/a	PO2							
12	Prowl H20	3.8 CS		0.95 lb ai/a	DPRE	9.3	9.0	4.3	9.0	5.7	8.7	47.14
	Buctril	2 EC		0.187 lb ai/a	DPRE							
	Zidua	85 WDG		0.186 lb ai/a	PO2							
13	Prowl H20	3.8 CS		0.95 lb ai/a	DPRE	8.3	8.3	2.3	9.0	5.7	9.0	49.29
	Buctril	2 EC		0.187 lb ai/a	DPRE							
	Zidua	85 WDG		0.267 lb ai/a	PO2							
14	Handweeded					6.7	5.7	2.0	4.0	2.7	7.3	56.02
	LSD P=.05					2.07	1.54	2.29	3.83	2.38	3.00	27.00
	Standard Deviation					1.23	0.92	1.36	2.27	1.41	1.78	16.09
	CV					13.03	10.05	36.68	27.42	25.69	20.55	38.4

Preemergence Weed Control in Seeded Green Onion and Leek - Mineral Soil- Van Drunen - 2018

Project Code: 112-18-6

Location: Momence, IL

Personnel: Bernard H. Zandstra, Nicole Soldan

Crop: Green Onion, Leek Variety: Tokyo Long White, American Flag
 Planting Method: Seeded Planting Date: 5/24/18 Harvest Date: See notes
 Spacing: 100 seeds/ft Row Spacing: 10 in; 2 rows of each crop/plot
 Tillage Type: Conventional Study Design: RCB Replications: 3
 Plot Size: 5.5 ft wide x 30 ft long

Soil Type: Jasper loam OM: 7.5% pH: 6.1
 Sand: 22% Silt: 37% Clay: 41% CEC: 24.7

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	5/24/18	10:30 AM	80/68	F	Dry	4-5 SW	35	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/24	Onion		Preemergence	
5/24	No weeds			

Notes and Comments

1. Spray applied with 4 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
 2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
 3. Pre = 1-3 DAS
 4. Plots maintained with GoalTender 0.125 lb ai/a & Select Max 0.125 lb ai/a.
 5. Green Onion harvested on 8/8/18 and Leek harvested on 9/26/18
 6. Leek had very poor stand in all plots.
-

**Preemergence Weed Control in Seeded Green Onion
and Leek - Mineral Soil- Van Drunen - 2018**

Michigan State University

Preemergence Weed Control in Seeded Green Onion and Leek - Mineral soil - Van Drunen - 2018

Trial ID: 112-18-6
Protocol ID: 112-18-6

Location: Mومence, IL
Investigator: Dr. Bernard Zandstra

Trial Year: 2018

Pest Code	Crop Code	Rating Date	Rating Type	Rating Unit	LACG			COPU			RRPW		
					LEEK 20Jun18 RATING	GRON 20Jun18 RATING	20Jun18 RATING	20Jun18 RATING	20Jun18 RATING	LEEK 07Jul17 RATING	GRON 07Jul18 RATING		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Unit	Growth Stage							
1	Prowl H20	3.8	CS	0.95	lb ai/a	PRE	8.0	1.0	5.7	10.0	2.7	6.3	1.0
2	Prowl H20	3.8	CS	0.95	lb ai/a	PRE	8.7	1.7	5.7	9.0	9.3	8.3	1.7
	Chateau SW	51	WDG	0.016	lb ai/a	PRE							
3	Zidua	85	WDG	0.033	lb ai/a	PRE	8.0	1.3	9.3	7.0	8.3	7.7	1.0
4	Zidua	85	WDG	0.066	lb ai/a	PRE	9.3	3.0	10.0	10.0	10.0	9.3	3.3
5	Zidua	85	WDG	0.133	lb ai/a	PRE	10.0	7.3	10.0	9.3	10.0	10.0	6.7
6	Zidua	85	WDG	0.186	lb ai/a	PRE	10.0	7.0	10.0	10.0	10.0	10.0	7.3
7	Prowl H20	3.8	CS	0.95	lb ai/a	PRE	8.0	5.7	10.0	10.0	9.7	8.3	5.7
	BIR	1.67	SL	0.033	lb ai/a	PRE							
8	Prowl H20	3.8	CS	0.95	lb ai/a	PRE	9.7	3.3	9.7	10.0	10.0	9.7	2.3
	Zidua	85	WDG	0.033	lb ai/a	PRE							
9	Prowl H20	3.8	CS	0.95	lb ai/a	PRE	10.0	6.3	10.0	10.0	10.0	10.0	6.7
	Zidua	85	WDG	0.133	lb ai/a	PRE							
10	Untreated						7.7	1.7	3.3	1.0	1.0	8.7	3.3
	LSD P=.05						1.16	2.85	2.28	1.13	0.85	2.09	2.13
	Standard Deviation						0.67	1.66	1.33	0.66	0.50	1.22	1.24
	CV						7.56	43.3	15.85	7.62	6.15	13.76	31.83

Preemergence Weed Control in Seeded Green Onion and Leek - Mineral Soil- Van Drunen - 2018

Pest Code	LACG COLQ COPU RRPW				LEEK	GRON	GRON					
Crop Code					08Aug18	08Aug18	08Aug18					
Rating Date	07Jul18 07Jul18 07Jul18 07Jul18				08Aug18	08Aug18	08Aug18					
Rating Type	RATING RATING RATING RATING				RATING	RATING	HARVEST					
Rating Unit					1-10	1-10	KG/PLOT					
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage							
1	Prowl H20	3.8	CS	0.95 lb ai/a	PRE	8.3	10.0	7.0	5.7	5.0	1.3	49.02
2	Prowl H20	3.8	CS	0.95 lb ai/a	PRE	9.3	10.0	7.0	8.3	5.7	1.7	31.70
	Chateau SW	51	WDG	0.016 lb ai/a	PRE							
3	Zidua	85	WDG	0.033 lb ai/a	PRE	10.0	3.0	2.0	6.3	9.3	2.0	31.66
4	Zidua	85	WDG	0.066 lb ai/a	PRE	10.0	8.3	7.0	9.7	8.3	3.0	17.88
5	Zidua	85	WDG	0.133 lb ai/a	PRE	10.0	10.0	8.0	9.3	9.7	5.3	5.61
6	Zidua	85	WDG	0.186 lb ai/a	PRE	10.0	10.0	9.0	9.7	10.0	6.0	6.39
7	Prowl H20	3.8	CS	0.95 lb ai/a	PRE	9.7	10.0	7.3	8.3	7.0	5.7	5.61
	BIR	1.67	SL	0.033 lb ai/a	PRE							
8	Prowl H20	3.8	CS	0.95 lb ai/a	PRE	10.0	10.0	8.0	9.7	9.3	2.7	18.92
	Zidua	85	WDG	0.033 lb ai/a	PRE							
9	Prowl H20	3.8	CS	0.95 lb ai/a	PRE	10.0	10.0	9.7	10.0	9.7	5.3	7.38
	Zidua	85	WDG	0.133 lb ai/a	PRE							
10	Untreated					1.0	7.0	5.3	1.7	10.0	7.0	3.30
	LSD P=.05					1.22	3.62	2.76	2.62	2.93	3.19	10.28
	Standard Deviation					0.71	2.11	1.61	1.53	1.71	1.86	5.99
	CV					8.06	23.9	22.91	19.45	20.35	46.47	33.78

Pest Code	LEEK		LEEK				
Crop Code	26Sep18		26Sep18				
Rating Date	HARVEST		HARVEST				
Rating Type	NO./PLOT		KG/PLOT				
Rating Unit							
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage		
1	Prowl H20	3.8	CS	0.95 lb ai/a	PRE	33.0	4.47
2	Prowl H20	3.8	CS	0.95 lb ai/a	PRE	23.3	3.21
	Chateau SW	51	WDG	0.016 lb ai/a	PRE		
3	Zidua	85	WDG	0.033 lb ai/a	PRE	5.3	0.73
4	Zidua	85	WDG	0.066 lb ai/a	PRE	10.3	0.99
5	Zidua	85	WDG	0.133 lb ai/a	PRE	0.7	0.06
6	Zidua	85	WDG	0.186 lb ai/a	PRE	1.0	0.10
7	Prowl H20	3.8	CS	0.95 lb ai/a	PRE	15.0	1.70
	BIR	1.67	SL	0.033 lb ai/a	PRE		
8	Prowl H20	3.8	CS	0.95 lb ai/a	PRE	3.3	0.37
	Zidua	85	WDG	0.033 lb ai/a	PRE		
9	Prowl H20	3.8	CS	0.95 lb ai/a	PRE	1.7	0.16
	Zidua	85	WDG	0.133 lb ai/a	PRE		
10	Untreated					0.0	0.00
	LSD P=.05					21.11	2.55
	Standard Deviation					12.30	1.49
	CV					131.35	126.33

Postemergence Weed Control in Seeded Green Onion and Leek - Mineral Soil - Van Drunen - 2018

Project Code: 112-18-7

Location: Momence, IL

Personnel: Bernard H. Zandstra, Nicole Soldan

Crop: Green Onion, Leek Variety: Tokyo Long White; American Flag
 Planting Method: Seeded Planting Date: 5/28/18 Harvest Date: See notes
 Spacing: 100 seeds/ft Row Spacing: 10 in; 2 rows of each crop/plot
 Tillage Type: Conventional Study Design: RCB Replications: 3
 Plot Size: 5.5 ft wide x 30 ft long

Soil Type: Jasper Loam OM: 7.5% pH: 6.1
 Sand: 22% Silt: 37% Clay: 41% CEC: 24.7

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	5/24	11:15 AM	82/60	F	Dry	4-5 SW	33	0% Cloudy	N
PO1	6/20	1:45 PM	76/76	F	Wet	1-2 NW	74	100% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/24	Leek		Seeded	
5/24	Green Onion		Seeded	
5/24	No weeds			
6/20	Leek	1-3"	1 LS	Poor
6/20	Green Onion	4"	2-3 LS	Good
6/20	LACG = Large Crabgrass	6-12"	Foliar	Many
6/20	COPU = Common Purslane	3-10"	Veg	Moderate
6/20	RRPW = Redroot Pigweed	2-10"	Veg	Many

Notes and Comments

1. Spray applied with 4 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
 2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
 3. PRE = 1-3 DAS; PO1 = 1 LS
 4. Plots maintained with GoalTender 0.125 lb ai/a & Select Max 0.12 lb ai/a.
 5. Green Onion harvested on 8/8/18 and Leek harvested on 9/26/18.
 6. Leek had very poor stand in all plots.
-

**Postemergence Weed Control in Seeded Green
Onion and Leek - Mineral Soil - Van Drunen -
2018
Michigan State University**

Postemergence Weed Control in Seeded Green Onion and Leek - Mineral Soil - Van Drunen - 2018

Trial ID: 112-18-7 Location: Momence, IL Trial Year: 2018
Protocol ID: 112-18-7 Investigator: Dr. Bernard Zandstra

Pest Code						LACG	COPU	RRPW					
Crop Code						LEEK	GRON			LEEK	GRON		
Rating Date						20Jun18	20Jun18	20Jun18	20Jun18	20Jun18	07Jul18	07Jul18	
Rating Type						RATING	RATING	RATING	RATING	RATING	RATING	RATING	
Rating Unit						1-10	1-10	1-10	1-10	1-10	1-10	1-10	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Unit	Stage							
1	Prowl H20	3.8	CS	0.95 lb ai/a	PRE,PO1		7.0	1.3	6.3	10.0	6.7	8.3	1.3
2	Prowl H20	3.8	CS	0.95 lb ai/a	PRE		7.0	1.3	6.0	10.0	5.3	8.3	1.3
	Zidua	85	WDG	0.033 lb ai/a	PO1								
3	Prowl H20	3.8	CS	0.95 lb ai/a	PRE		6.7	1.0	6.3	10.0	6.7	7.3	1.7
	Zidua	85	WDG	0.066 lb ai/a	PO1								
4	Prowl H20	3.8	CS	0.95 lb ai/a	PRE		6.7	1.0	6.3	10.0	5.7	8.0	2.7
	Zidua	85	WDG	0.133 lb ai/a	PO1								
5	Prowl H20	3.8	CS	0.95 lb ai/a	PRE		7.7	1.3	6.0	10.0	6.0	8.3	2.3
	Zidua	85	WDG	0.186 lb ai/a	PO1								
6	Prowl H20	3.8	CS	0.95 lb ai/a	PRE		8.0	1.7	6.0	10.0	6.3	8.3	2.3
	Zidua	85	WDG	0.267 lb ai/a	PO1								
7	Prowl H20	3.8	CS	0.95 lb ai/a	PRE		7.0	2.0	6.7	10.0	7.0	8.3	3.3
	BIR	1.67	SL	0.033 lb ai/a	PO1								
8	Prowl H20	3.8	CS	0.95 lb ai/a	PRE		8.3	1.3	7.0	10.0	4.3	9.7	2.0
	BIR	1.67	SL	0.033 lb ai/a	PO1								
	NIS	100	SL	0.25 % v/v	PO1								
9	Prowl H20	3.8	CS	0.95 lb ai/a	PRE		8.7	2.7	7.7	10.0	5.7	9.3	3.3
	Chateau SW	51	WDG	0.032 lb ai/a	PO1								
10	Untreated						8.7	1.0	1.0	1.0	1.0	9.0	4.0
	LSD P=.05						1.71	1.19	1.09	0.00	2.21	2.06	2.21
	Standard Deviation						1.00	0.70	0.64	0.00	1.29	1.20	1.29
	CV						13.19	47.49	10.71	0.0	23.54	14.12	52.94

**Postemergence Weed Control in Seeded Green
Onion and Leek - Mineral Soil - Van Drunen -
2018**

Pest Code					LACG	RRPW				
Crop Code							LEEK	GRON		
Rating Date					07Jul18	07Jul18	08Aug18	08Aug18		
Rating Type					RATING	RATING	RATING	RATING		
Rating Unit					1-10	1-10	1-10	1-10		
Trt	Treatment	Form	Form	Rate	Growth					
No.	Name	Conc	Type	Rate	Unit	Stage				
1	Prowl H20	3.8	CS	0.95	lb ai/a	PRE,PO1	10.0	7.3	4.3	1.3
2	Prowl H20	3.8	CS	0.95	lb ai/a	PRE	10.0	3.7	5.0	1.7
	Zidua	85	WDG	0.033	lb ai/a	PO1				
3	Prowl H20	3.8	CS	0.95	lb ai/a	PRE	10.0	7.3	2.7	1.7
	Zidua	85	WDG	0.066	lb ai/a	PO1				
4	Prowl H20	3.8	CS	0.95	lb ai/a	PRE	10.0	5.7	4.3	2.3
	Zidua	85	WDG	0.133	lb ai/a	PO1				
5	Prowl H20	3.8	CS	0.95	lb ai/a	PRE	10.0	7.7	6.0	1.7
	Zidua	85	WDG	0.186	lb ai/a	PO1				
6	Prowl H20	3.8	CS	0.95	lb ai/a	PRE	9.3	7.3	6.3	3.0
	Zidua	85	WDG	0.267	lb ai/a	PO1				
7	Prowl H20	3.8	CS	0.95	lb ai/a	PRE	10.0	8.3	6.3	3.0
	BIR	1.67	SL	0.033	lb ai/a	PO1				
8	Prowl H20	3.8	CS	0.95	lb ai/a	PRE	9.3	5.0	7.2	2.7
	BIR	1.67	SL	0.033	lb ai/a	PO1				
	NIS	100	SL	0.25	% v/v	PO1				
9	Prowl H20	3.8	CS	0.95	lb ai/a	PRE	9.7	10.0	6.7	2.7
	Chateau SW	51	WDG	0.032	lb ai/a	PO1				
10	Untreated						7.0	3.3	7.7	6.3
	LSD P=.05						1.00	3.40	5.25	1.43
	Standard Deviation						0.58	1.98	3.05	0.83
	CV						6.12	30.22	53.92	31.6

**Postemergence Weed Control in Seeded Green
Onion and Leek - Mineral Soil - Van Drunen -
2018**

Pest Code						GRON	LEEK	LEEK	
Crop Code						08Aug18	26Sep18	26Sep18	
Rating Date						HARVEST	HARVEST	HARVEST	
Rating Type						KG/PLOT	NO./PLOT	KG/PLOT	
Rating Unit									
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage			
1	Prowl H20	3.8 CS		0.95 lb ai/a		PRE,PO1	36.927	29.0	4.89
2	Prowl H20	3.8 CS		0.95 lb ai/a		PRE	39.340	22.3	3.99
	Zidua	85 WDG		0.033 lb ai/a		PO1			
3	Prowl H20	3.8 CS		0.95 lb ai/a		PRE	44.380	33.0	5.36
	Zidua	85 WDG		0.066 lb ai/a		PO1			
4	Prowl H20	3.8 CS		0.95 lb ai/a		PRE	31.307	20.3	3.50
	Zidua	85 WDG		0.133 lb ai/a		PO1			
5	Prowl H20	3.8 CS		0.95 lb ai/a		PRE	33.167	12.0	2.00
	Zidua	85 WDG		0.186 lb ai/a		PO1			
6	Prowl H20	3.8 CS		0.95 lb ai/a		PRE	27.640	14.3	2.73
	Zidua	85 WDG		0.267 lb ai/a		PO1			
7	Prowl H20	3.8 CS		0.95 lb ai/a		PRE	18.027	14.3	2.08
	BIR	1.67 SL		0.033 lb ai/a		PO1			
8	Prowl H20	3.8 CS		0.95 lb ai/a		PRE	24.800	6.7	0.99
	BIR	1.67 SL		0.033 lb ai/a		PO1			
	NIS	100 SL		0.25 % v/v		PO1			
9	Prowl H20	3.8 CS		0.95 lb ai/a		PRE	21.337	10.3	2.26
	Chateau SW	51 WDG		0.032 lb ai/a		PO1			
10	Untreated						3.460	1.0	0.21
LSD P=.05							14.9437	19.72	3.99
Standard Deviation							8.7112	11.49	2.33
CV							31.07	70.36	83.1

Preemergence Weed Control - Seeded Green Onion and Leek - Muck Soil - Schreur - 2018

Project Code: 112-18-4

Location: Hudsonville, MI

Personnel: Bernard H. Zandstra, Nicole Soldan
 Crop: Green Onion, Leek Variety: Isikura, American Flag
 Planting Method: Seeded Planting Date: 4/28/18
 Spacing: 3 inch Row Spacing: 24 inch; 1 row each crop/plot
 Tillage Type: Conventional Study Design: RCB Replications: 3
 Plot Size: 2.7 ft wide x 30 ft long

Soil Type: Carlisle muck OM: 69.8% pH: 5.6
 Sand: 13% Silt: 15% Clay: 2% CEC: N/A

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	5/8	3:00 PM	70/58	F	Dry	6-8 SW	30	0% Cloudy	N
DPRE	5/14	1:35 PM	60/56	F	Wet	3-5 NE	80	100% Cloudy	Y
PO1	5/25	12:00 PM	85/63	F	Damp	7-9 SW	54	0% Cloudy	N
PO2	6/1	2:30 PM	80/72	F	Moist	5-7 NW	54	35% Cloudy	N

Crop and Weed Information at Application

Date	Crop/Weed	Height or Diameter	Growth Stage	Density
5/8	No Crop			
5/8	Various Weeds	< 0.5"	Cotyledon	Many
5/14	Green Onion	0.5-1"	Loop, Flag	Good
5/14	Leek	0.5-1"	Loop	Good
5/14	No weeds			
5/25	Green Onion	2-4"	1 LS	Good
5/25	Leek	2-3"	1 LS	Good
5/25	COPU = Common Purslane	0.25-0.5"	Cotyledon - 1 LS	Many
5/25	LATH = Ladysthumb	0.25-0.5"	Cotyledon	Many
6/1	Green Onion	4-5"	2 LS	Good
6/1	Leek	5-6"	2 LS	Good
6/1	COPU = Common Purslane	0.5-3"	Cotyledon - 10 LS	Very Many
6/1	LATH = Ladysthumb	0.5-4"	Cotyledon - 6 LS	Many
6/1	RRPW = Redroot Pigweed	1-3"	4-6 LS	Moderate
	CEPR = Common Evening Primrose			
	COGR = Common Groundsel			

Notes and Comments

1. Spray applied with 2 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
3. Use GoalTender and Select Max for postemergence weed control.

**Preemergence Weed Control - Seeded Green Onion
and Leek - Muck Soil - Schreur - 2018**

Michigan State University

Preemergence Weed Control - Seeded Green Onion and Leek - Muck Soil - Schreur - 2018

Trial ID: 112-18-4
Protocol ID: 112-18-4

Location: Hudsonville, MI
Investigator: Dr. Bernard Zandstra

Trial Year: 2018

Pest Code	Crop Code	Rating Date	Rating Type	Rating Unit	GRON		LEEK		COPU		LATH	
					25May18	01Jun18	25May18	01Jun18	25May18	01Jun18	25May18	01Jun18
					RATING	RATING	RATING	RATING	RATING	RATING	RATING	RATING
					1-10	1-10	1-10	1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Unit	Growth Stage						
1	Zidua	85 WDG		0.133 lb ai/a		PRE	4.0	2.7	9.0	8.7	4.3	2.7
2	Zidua	85 WDG		0.186 lb ai/a		PRE	4.3	3.7	9.7	9.7	4.3	3.3
3	Zidua	85 WDG		0.267 lb ai/a		PRE	6.0	4.7	9.7	9.7	5.0	3.7
4	Prowl H20	3.8 CS		1.9 lb ai/a		PRE	1.3	1.0	5.0	5.0	1.0	1.0
5	Handweeded						1.0	1.0	1.0	1.0	1.0	1.0
6	Prowl H20	3.8 CS		1.9 lb ai/a		PRE	1.0	1.0	6.0	5.7	1.0	1.0
	Zidua	85 WDG		0.133 lb ai/a		PO1						
7	Prowl H20	3.8 CS		1.9 lb ai/a		PRE	2.0	1.0	7.7	7.7	2.0	1.3
	Zidua	85 WDG		0.186 lb ai/a		PO1						
8	Prowl H20	3.8 CS		1.9 lb ai/a		PRE	1.3	1.0	7.3	7.3	2.0	1.3
	Zidua	85 WDG		0.267 lb ai/a		PO1						
9	Prowl H20	3.8 CS		1.9 lb ai/a		PRE	1.0	1.0	6.0	6.0	1.0	1.0
	Prowl H20	3.8 CS		1.9 lb ai/a		PO1						
10	Prowl H20	3.8 CS		1.9 lb ai/a		PRE	3.7	3.3	9.3	9.3	3.0	2.3
	Chateau SW	51 WDG		0.032 lb ai/a		PRE						
11	Prowl H20	3.8 CS		1.9 lb ai/a		DPRE	2.7	1.7	6.3	6.3	1.7	1.3
	Buctril	2 EC		0.187 lb ai/a		DPRE						
12	Zidua	85 WDG		0.133 lb ai/a		DPRE	2.7	1.3	6.0	5.7	3.0	1.7
	Buctril	2 EC		0.187 lb ai/a		DPRE						
13	Prowl H20	3.8 CS		1.9 lb ai/a		DPRE	1.3	1.0	3.7	3.0	1.0	1.0
	Buctril	2 EC		0.187 lb ai/a		DPRE						
	Zidua	85 WDG		0.133 lb ai/a		PO2						
14	Prowl H20	3.8 CS		1.9 lb ai/a		DPRE	1.7	1.0	3.7	3.7	1.7	1.0
	Buctril	2 EC		0.187 lb ai/a		DPRE						
	Zidua	85 WDG		0.186 lb ai/a		PO2						
15	Prowl H20	3.8 CS		1.9 lb ai/a		DPRE	1.3	1.0	2.7	2.7	1.0	1.0
	Buctril	2 EC		0.187 lb ai/a		DPRE						
	Zidua	85 WDG		0.267 lb ai/a		PO2						
16	Handweeded						1.3	1.0	1.3	1.7	1.0	1.0
	LSD P=.05						1.68	1.20	3.28	3.25	0.93	0.81
	Standard Deviation						1.01	0.72	1.97	1.95	0.56	0.48
	CV						43.91	42.02	33.37	33.54	26.19	30.2

**Preemergence Weed Control - Seeded Green Onion
and Leek - Muck Soil - Schreur - 2018**

Pest Code					COPU	LATH	RRPW			CEPR	COGR		
Crop Code								GRON	LEEK				
Rating Date					01Jun18	01Jun18	01Jun18	08Jun18	08Jun18	08Jun18	08Jun18		
Rating Type					RATING	RATING	RATING	RATING	RATING	RATING	RATING		
Rating Unit					1-10	1-10	1-10	1-10	1-10	1-10	1-10		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Unit	Stage							
1	Zidua	85 WDG		0.133 lb ai/a	PRE		9.3	6.7	10.0	3.3	1.7	8.0	9.0
2	Zidua	85 WDG		0.186 lb ai/a	PRE		9.7	7.3	10.0	4.0	2.3	10.0	9.7
3	Zidua	85 WDG		0.267 lb ai/a	PRE		10.0	8.0	10.0	4.0	2.7	10.0	10.0
4	Prowl H2O	3.8 CS		1.9 lb ai/a	PRE		3.0	4.7	6.3	1.7	1.3	2.3	6.3
5	Handweeded						1.0	1.0	1.0	1.3	1.3	1.3	4.7
6	Prowl H2O	3.8 CS		1.9 lb ai/a	PRE		7.0	7.3	9.3	1.0	1.0	5.7	7.7
	Zidua	85 WDG		0.133 lb ai/a	PO1								
7	Prowl H2O	3.8 CS		1.9 lb ai/a	PRE		8.0	8.3	10.0	2.0	1.7	7.7	8.0
	Zidua	85 WDG		0.186 lb ai/a	PO1								
8	Prowl H2O	3.8 CS		1.9 lb ai/a	PRE		8.0	8.3	10.0	2.7	1.7	8.7	8.7
	Zidua	85 WDG		0.267 lb ai/a	PO1								
9	Prowl H2O	3.8 CS		1.9 lb ai/a	PRE		6.3	6.7	9.3	1.7	1.7	5.0	7.7
	Prowl H2O	3.8 CS		1.9 lb ai/a	PO1								
10	Prowl H2O	3.8 CS		1.9 lb ai/a	PRE		8.3	9.0	10.0	3.3	2.7	7.3	8.7
	Chateau SW	51 WDG		0.032 lb ai/a	PRE								
11	Prowl H2O	3.8 CS		1.9 lb ai/a	DPRE		6.3	4.3	6.0	1.3	1.3	4.7	7.3
	Buctril	2 EC		0.187 lb ai/a	DPRE								
12	Zidua	85 WDG		0.133 lb ai/a	DPRE		6.0	6.0	7.0	3.0	1.3	7.0	7.7
	Buctril	2 EC		0.187 lb ai/a	DPRE								
13	Prowl H2O	3.8 CS		1.9 lb ai/a	DPRE		4.7	3.3	5.7	1.3	1.3	3.7	6.0
	Buctril	2 EC		0.187 lb ai/a	DPRE								
	Zidua	85 WDG		0.133 lb ai/a	PO2								
14	Prowl H2O	3.8 CS		1.9 lb ai/a	DPRE		5.3	4.0	7.0	1.7	1.3	4.3	6.7
	Buctril	2 EC		0.187 lb ai/a	DPRE								
	Zidua	85 WDG		0.186 lb ai/a	PO2								
15	Prowl H2O	3.8 CS		1.9 lb ai/a	DPRE		5.7	4.7	4.3	2.0	2.0	7.0	7.0
	Buctril	2 EC		0.187 lb ai/a	DPRE								
	Zidua	85 WDG		0.267 lb ai/a	PO2								
16	Handweeded						1.0	1.0	1.0	1.7	1.3	2.3	4.0
	LSD P=.05						2.82	2.15	3.69	1.24	1.00	3.34	2.39
	Standard Deviation						1.69	1.29	2.22	0.74	0.60	2.00	1.44
	CV						27.19	22.75	30.29	33.0	35.99	33.71	19.3

**Preemergence Weed Control - Seeded Green Onion
and Leek - Muck Soil - Schreur - 2018**

					COPU	LATH	RRPW	LEEK		
					08Jun18	08Jun18	08Jun18	23Jul18	23Jul18	
					RATING	RATING	RATING	RATING	RATING	
					1-10	1-10	1-10	1-10	1-10	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Growth Stage					
1	Zidua	85	WDG	0.133 lb ai/a	PRE	10.0	6.3	10.0	2.3	2.0
2	Zidua	85	WDG	0.186 lb ai/a	PRE	10.0	7.0	10.0	2.7	1.3
3	Zidua	85	WDG	0.267 lb ai/a	PRE	10.0	7.7	10.0	2.7	2.0
4	Prowl H2O	3.8	CS	1.9 lb ai/a	PRE	9.3	7.0	8.3	1.3	1.7
5	Handweeded					4.3	6.3	5.0	1.3	4.3
6	Prowl H2O	3.8	CS	1.9 lb ai/a	PRE	8.7	8.0	10.0	1.3	2.7
	Zidua	85	WDG	0.133 lb ai/a	PO1					
7	Prowl H2O	3.8	CS	1.9 lb ai/a	PRE	10.0	8.3	10.0	1.7	2.7
	Zidua	85	WDG	0.186 lb ai/a	PO1					
8	Prowl H2O	3.8	CS	1.9 lb ai/a	PRE	10.0	8.7	10.0	2.0	2.3
	Zidua	85	WDG	0.267 lb ai/a	PO1					
9	Prowl H2O	3.8	CS	1.9 lb ai/a	PRE	10.0	8.0	9.3	1.0	1.7
	Prowl H2O	3.8	CS	1.9 lb ai/a	PO1					
10	Prowl H2O	3.8	CS	1.9 lb ai/a	PRE	10.0	9.0	9.7	2.0	1.7
	Chateau SW	51	WDG	0.032 lb ai/a	PRE					
11	Prowl H2O	3.8	CS	1.9 lb ai/a	DPRE	10.0	6.3	7.7	1.3	3.3
	Buctril	2	EC	0.187 lb ai/a	DPRE					
12	Zidua	85	WDG	0.133 lb ai/a	DPRE	10.0	6.7	9.3	1.7	3.0
	Buctril	2	EC	0.187 lb ai/a	DPRE					
13	Prowl H2O	3.8	CS	1.9 lb ai/a	DPRE	9.3	5.7	7.0	2.0	6.3
	Buctril	2	EC	0.187 lb ai/a	DPRE					
	Zidua	85	WDG	0.133 lb ai/a	PO2					
14	Prowl H2O	3.8	CS	1.9 lb ai/a	DPRE	10.0	6.0	8.3	1.0	6.7
	Buctril	2	EC	0.187 lb ai/a	DPRE					
	Zidua	85	WDG	0.186 lb ai/a	PO2					
15	Prowl H2O	3.8	CS	1.9 lb ai/a	DPRE	10.0	6.7	9.3	1.7	5.0
	Buctril	2	EC	0.187 lb ai/a	DPRE					
	Zidua	85	WDG	0.267 lb ai/a	PO2					
16	Handweeded					8.7	5.7	6.3	2.0	4.0
LSD P=.05						1.64	1.39	1.91	1.21	2.39
Standard Deviation						0.99	0.83	1.14	0.73	1.44
CV						10.49	11.78	13.05	41.46	45.32

**Preemergence Weed Control - Seeded Green Onion
and Leek - Muck Soil - Schreur - 2018**

Pest Code				GRON		GRON		LEEK		LEEK	
Crop Code				19Jul18		19Jul18		06Sep18		06Sep18	
Rating Date				HARVEST		HARVEST		HARVEST		HARVEST	
Rating Type				NO./PLOT		KG/PLOT		NO./PLOT		KG/PLOT	
Rating Unit											
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	Zidua	85	WDG	0.133	lb ai/a	PRE	65.7	2.74	214.3	49.41	
2	Zidua	85	WDG	0.186	lb ai/a	PRE	67.7	2.48	135.3	34.46	
3	Zidua	85	WDG	0.267	lb ai/a	PRE	71.7	3.00	125.0	35.16	
4	Prowl H20	3.8	CS	1.9	lb ai/a	PRE	150.7	6.46	249.3	56.72	
5	Handweeded						171.7	6.01	293.7	58.10	
6	Prowl H20	3.8	CS	1.9	lb ai/a	PRE	171.3	7.07	273.7	62.48	
	Zidua	85	WDG	0.133	lb ai/a	PO1					
7	Prowl H20	3.8	CS	1.9	lb ai/a	PRE	114.7	4.74	271.3	60.26	
	Zidua	85	WDG	0.186	lb ai/a	PO1					
8	Prowl H20	3.8	CS	1.9	lb ai/a	PRE	108.3	3.65	238.0	54.63	
	Zidua	85	WDG	0.267	lb ai/a	PO1					
9	Prowl H20	3.8	CS	1.9	lb ai/a	PRE	155.7	6.73	265.3	61.52	
	Prowl H20	3.8	CS	1.9	lb ai/a	PO1					
10	Prowl H20	3.8	CS	1.9	lb ai/a	PRE	116.0	5.33	200.3	43.79	
	Chateau SW	51	WDG	0.032	lb ai/a	PRE					
11	Prowl H20	3.8	CS	1.9	lb ai/a	DPRE	150.3	6.63	272.7	62.56	
	Buctril	2	EC	0.187	lb ai/a	DPRE					
12	Zidua	85	WDG	0.133	lb ai/a	DPRE	120.7	5.48	246.7	58.0	
	Buctril	2	EC	0.187	lb ai/a	DPRE					
13	Prowl H20	3.8	CS	1.9	lb ai/a	DPRE	144.3	4.79	257.0	58.45	
	Buctril	2	EC	0.187	lb ai/a	DPRE					
	Zidua	85	WDG	0.133	lb ai/a	PO2					
14	Prowl H20	3.8	CS	1.9	lb ai/a	DPRE	152.0	6.10	270.7	65.05	
	Buctril	2	EC	0.187	lb ai/a	DPRE					
	Zidua	85	WDG	0.186	lb ai/a	PO2					
15	Prowl H20	3.8	CS	1.9	lb ai/a	DPRE	138.0	5.53	257.3	61.81	
	Buctril	2	EC	0.187	lb ai/a	DPRE					
	Zidua	85	WDG	0.267	lb ai/a	PO2					
16	Handweeded						152.3	5.00	250.3	57.81	
	LSD P=.05						62.30	2.240	62.05	12.897	
	Standard Deviation						37.36	1.3437	37.21	7.73574	
	CV						29.15	26.29	15.58	14.06	

Weed Control in Bell Pepper & Tomato - HTRC - 2018

Project Code: 101-18-1

Location: East Lansing, MI
Block 87

Personnel: Bernard H. Zandstra, Nicole Soldan
 Crop: Bell Pepper, Tomato Variety: Aristotle; Camaro
 Planting Method: Transplanted Planting Date: 5/30/18 Harvest Date:
 Spacing: 22" Row Spacing: 3 ft; 1 row each crop/plot
 Tillage Type: Conventional Study Design: RCB Replications: 3
 Plot Size: 5.3 ft wide x 30 ft long

Soil Type: Marlette fine sandy loam OM: 1.5% pH: 5.5
 Sand: 60% Silt: 21% Clay: 19% CEC: 6.8

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRT/PP1	5/30/18	11:00 AM	85/70	F	Dry	4-6 SE	49	90% Cloudy	N
PO1 DIR	6/21/18	1:50 PM	76/72	F	Dry	2-8 SE	45	40% Cloudy	N
PO2 DIR	7/2/18	10:00 AM	78/78	F	Dry	3-4 NW	51	50% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/30	Bell Pepper		Pre-transplant	
5/30	Tomato		Pre-transplant	
5/30	No weeds			
6/21	Bell Pepper	6-7"	Few buds 8 LS	Good
6/21	Tomato	8-11"	8-9 LS	Good
6/21	LACG = Large Crabgrass	2-4"	Veg	Many
6/21	COLQ = Common Lambsquarters	1-2"	Veg	Mod
6/21	COPU = Common Purslane	1-3" Dia	Veg	Mod
6/21	CORW = Common Ragweed	2-3"	Veg	Many
6/21	RRPW = Redroot Pigweed	1-3"	Veg	Few
6/21	WIRA = Wild Radish	8" Dia	Veg	Moderate
7/2	Pepper	8-10"	Veg	Good
7/2	Tomato	17-15"	Flower	Good
7/2	YEFT = Yellow Foxtail	1-10"	Veg	Many
7/2	COLQ = Common Lambsquarters	2-5"	Veg	Many
7/2	COPU = Common Purslane	2-10"	Veg	Many
7/2	CORW = Common Ragweed	4-10"	Veg	Many

Notes and Comments

1. Spray applied with 4 nozzle boom for PPI & PRT and with 3 Nozzle Shielded boom for PO1/PO2. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Weed Control in Bell Pepper & Tomato - HTRC - 2018

Michigan State University

Weed Control in Bell Pepper & Tomato - HTRC - 2018

Trial ID: 101-18-1
Protocol ID: 101-18-1

Location: East Lansing, MI
Investigator: Dr. Bernard Zandstra

Trial Year: 2018

Pest Code						YEFT	COPU	CORW	RRPW		
Crop Code				PEPPER TOMATO							
Rating Date				19Jun18	19Jun18	19Jun18	19Jun18	19Jun18	19Jun18		
Rating Type				RATING	RATING	RATING	RATING	RATING	RATING		
Rating Unit				1-10	1-10	1-10	1-10	1-10	1-10		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Growth Stage						
1	Prowl H20	3.8	CS	1.4 lb ai/a	PRT	1.0	1.3	7.3	10.0	2.0	10.0
2	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	2.0	1.7	10.0	10.0	10.0	10.0
	Reflex	2	SL	0.125 lb ai/a	PRT						
3	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	1.7	2.7	10.0	10.0	8.7	10.0
	Command	3	ME	0.5 lb ai/a	PRT						
4	Tricor	75	DF	0.5 lb ai/a	PPI	8.7	1.7	9.7	10.0	10.0	10.0
	Treflan	4	EC	1 lb ai/a	PPI						
5	Spartan	4	F	0.25 lb ai/a	PRT	1.7	1.0	10.0	9.7	5.7	10.0
	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT						
6	Authority MTZ	45	DF	0.338 lb ai/a	PRT	5.7	2.0	8.7	9.3	9.0	10.0
7	Spartan	4	F	0.25 lb ai/a	PRT	1.7	2.0	9.3	10.0	4.3	10.0
	Prowl H20	3.8	CS	1.4 lb ai/a	PRT						
8	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	1.7	1.0	9.0	9.3	5.7	10.0
	Sandea	75	WG	0.023 lb ai/a	PO1DIR						
	Select Max	.97	EC	0.12 lb ai/a	PO1DIR						
9	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	1.0	1.0	10.0	9.3	5.0	10.0
	Reglone	2	L	0.5 lb ai/a	PO2DIR						
10	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	1.3	1.0	10.0	10.0	4.3	10.0
	Reflex	2	SL	0.125 lb ai/a	PRT						
	Gramoxone SL	2	SL	0.5 lb ai/a	PO2DIR						
11	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	1.3	1.3	10.0	9.7	5.7	10.0
	Rely 280	2.34	L	0.58 lb ai/a	PO1DIR						
12	Untreated					1.0	1.0	1.0	1.0	1.0	1.0
	LSD P=.05					1.19	0.69	1.44	1.01	3.37	0.00
	Standard Deviation					0.71	0.41	0.85	0.59	1.99	0.00
	CV					29.52	27.52	9.75	6.59	33.44	0.0

Weed Control in Bell Pepper & Tomato - HTRC - 2018

Pest Code		WIRA						YEFT
Crop Code		PEPPER		TOMATO		PEPPER	TOMATO	
Rating Date		19Jun18	26Jun18	26Jun18	29Jun18	29Jun18	29Jun18	
Rating Type		RATING	STAND	STAND	RATING	RATING	RATING	
Rating Unit		1-10	NO./PLOT	NO./PLOT	1-10	1-10	1-10	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Growth Unit	Stage		
1	Prowl H20	3.8	CS	1.4 lb ai/a	PRT	7.0	5.0	
2	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	10.0	9.7	
	Reflex	2	SL	0.125 lb ai/a	PRT			
3	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	10.0	10.0	
	Command	3	ME	0.5 lb ai/a	PRT			
4	Tricor	75	DF	0.5 lb ai/a	PPI	10.0	9.0	
	Treflan	4	EC	1 lb ai/a	PPI			
5	Spartan	4	F	0.25 lb ai/a	PRT	2.3	8.7	
	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT			
6	Authority MTZ	45	DF	0.338 lb ai/a	PRT	10.0	7.0	
7	Spartan	4	F	0.25 lb ai/a	PRT	7.3	6.3	
	Prowl H20	3.8	CS	1.4 lb ai/a	PRT			
8	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	5.3	10.0	
	Sandea	75	WG	0.023 lb ai/a	PO1DIR			
	Select Max	.97	EC	0.12 lb ai/a	PO1DIR			
9	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	5.3	9.3	
	Reglone	2	L	0.5 lb ai/a	PO2DIR			
10	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	7.7	9.7	
	Reflex	2	SL	0.125 lb ai/a	PRT			
	Gramoxone SL	2	SL	0.5 lb ai/a	PO2DIR			
11	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	5.7	10.0	
	Rely 280	2.34	L	0.58 lb ai/a	PO1DIR			
12	Untreated					1.0	1.0	
LSD P=.05						3.01	1.54	
Standard Deviation						1.77	0.91	
CV						26.07	11.43	

Weed Control in Bell Pepper & Tomato - HTRC - 2018

Pest Code		COLQ		COPU		CORW		WIRA		PEPPER TOMATO	
Crop Code		29Jun18		29Jun18		29Jun18		29Jun18		09Jul18 09Jul18	
Rating Date		RATING		RATING		RATING		RATING		RATING	
Rating Type		1-10		1-10		1-10		1-10		1-10	
Rating Unit											
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Unit	Growth Stage					
1	Prowl H20	3.8	CS	1.4	lb ai/a	PRT	10.0	10.0	2.3	6.7	1.3 1.0
2	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	9.7	9.0	8.7	9.3	1.3 1.0
	Reflex	2	SL	0.125	lb ai/a	PRT					
3	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	10.0	10.0	7.3	8.7	1.3 1.7
	Command	3	ME	0.5	lb ai/a	PRT					
4	Tricor	75	DF	0.5	lb ai/a	PPI	10.0	10.0	9.0	9.3	7.3 1.3
	Treflan	4	EC	1	lb ai/a	PPI					
5	Spartan	4	F	0.25	lb ai/a	PRT	10.0	7.7	3.3	5.0	2.0 1.0
	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT					
6	Authority MTZ	45	DF	0.338	lb ai/a	PRT	9.7	9.3	7.7	10.0	5.0 1.3
7	Spartan	4	F	0.25	lb ai/a	PRT	10.0	10.0	3.0	8.3	2.0 2.0
	Prowl H20	3.8	CS	1.4	lb ai/a	PRT					
8	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	5.3	8.7	7.7	8.7	1.0 1.0
	Sandea	75	WG	0.023	lb ai/a	PO1DIR					
	Select Max	.97	EC	0.12	lb ai/a	PO1DIR					
9	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	6.3	8.3	8.0	8.7	3.7 2.7
	Reglone	2	L	0.5	lb ai/a	PO2DIR					
10	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	7.3	7.7	3.0	9.0	4.7 2.7
	Reflex	2	SL	0.125	lb ai/a	PRT					
	Gramoxone SL	2	SL	0.5	lb ai/a	PO2DIR					
11	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	10.0	9.7	8.7	8.0	1.0 1.0
	Rely 280	2.34	L	0.58	lb ai/a	PO1DIR					
12	Untreated						1.0	1.0	1.0	1.0	2.3 2.0
	LSD P=.05						1.89	1.67	3.00	2.39	1.61 0.95
	Standard Deviation						1.11	0.98	1.77	1.41	0.95 0.56
	CV						13.45	11.65	30.53	18.3	34.67 36.12

Weed Control in Bell Pepper & Tomato - HTRC - 2018

Pest Code				YEFT	COLQ	COPU	WIRA					
Crop Code				09Jul18	09Jul18	09Jul18	09Jul18	PEPPER	TOMATO			
Rating Date				RATING	RATING	RATING	RATING	STAND	STAND			
Rating Type				1-10	1-10	1-10	1-10	NO./PLOT	NO./PLOT			
Rating Unit												
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Unit	Growth Stage						
1	Prowl H20	3.8	CS	1.4	lb ai/a	PRT	5.0	8.7	4.0	4.0	15.3	11.0
2	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	8.7	9.0	8.3	9.3	15.0	14.3
	Reflex	2	SL	0.125	lb ai/a	PRT						
3	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	10.0	9.7	7.0	8.0	14.3	14.3
	Command	3	ME	0.5	lb ai/a	PRT						
4	Tricor	75	DF	0.5	lb ai/a	PPI	8.0	10.0	8.7	9.7	4.3	14.0
	Treflan	4	EC	1	lb ai/a	PPI						
5	Spartan	4	F	0.25	lb ai/a	PRT	8.0	10.0	5.3	7.0	14.0	16.0
	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT						
6	Authority MTZ	45	DF	0.338	lb ai/a	PRT	4.0	10.0	5.3	9.0	10.7	14.3
7	Spartan	4	F	0.25	lb ai/a	PRT	4.7	10.0	3.7	9.0	13.7	12.0
	Prowl H20	3.8	CS	1.4	lb ai/a	PRT						
8	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	10.0	3.7	7.0	10.0	15.3	15.0
	Sandea	75	WG	0.023	lb ai/a	PO1DIR						
	Select Max	.97	EC	0.12	lb ai/a	PO1DIR						
9	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	9.7	6.3	8.7	8.0	13.0	13.0
	Reglone	2	L	0.5	lb ai/a	PO2DIR						
10	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	10.0	8.0	8.0	8.0	10.7	12.7
	Reflex	2	SL	0.125	lb ai/a	PRT						
	Gramoxone SL	2	SL	0.5	lb ai/a	PO2DIR						
11	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	10.0	8.3	8.3	7.7	15.3	15.0
	Rely 280	2.34	L	0.58	lb ai/a	PO1DIR						
12	Untreated						1.0	1.7	5.3	8.0	13.3	14.7
LSD P=.05							2.44	2.75	4.79	4.48	3.56	3.04
Standard Deviation							1.44	1.62	2.83	2.65	2.11	1.80
CV							19.39	20.43	42.64	32.54	16.3	12.96

Weed Control in Bell Pepper & Tomato - HTRC - 2018

Pest Code						PEPPER	PEPPER	PEPPER	PEPPER	PEPPER	
Crop Code						09Aug18	09Aug18	13Aug18	13Aug18	22Aug18	
Rating Date						HARVEST	HARVEST	HARVEST	HARVEST	HARVEST	
Rating Type						NO./PLOT	KG/PLOT	NO./PLOT	KG/PLOT	NO./PLOT	
Rating Unit											
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Rate Unit	Growth Stage					
1	Prowl H20	3.8	CS	1.4	lb ai/a	PRT	4.7	1.567	16.7	3.607	6.0
2	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	13.3	3.480	25.3	5.400	15.3
	Reflex	2	SL	0.125	lb ai/a	PRT					
3	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	14.3	3.747	29.0	6.300	20.3
	Command	3	ME	0.5	lb ai/a	PRT					
4	Tricor	75	DF	0.5	lb ai/a	PPI	1.3	0.487	1.7	0.353	3.0
	Treflan	4	EC	1	lb ai/a	PPI					
5	Spartan	4	F	0.25	lb ai/a	PRT	4.7	1.413	14.3	3.120	9.7
	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT					
6	Authority MTZ	45	DF	0.338	lb ai/a	PRT	3.0	1.047	5.0	1.360	8.3
7	Spartan	4	F	0.25	lb ai/a	PRT	6.7	2.813	15.0	3.147	10.7
	Prowl H20	3.8	CS	1.4	lb ai/a	PRT					
8	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	10.0	1.433	13.3	2.993	13.7
	Sandea	75	WG	0.023	lb ai/a	PO1DIR					
	Select Max	.97	EC	0.12	lb ai/a	PO1DIR					
9	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	7.7	2.400	6.3	1.487	5.3
	Reglone	2	L	0.5	lb ai/a	PO2DIR					
10	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	5.0	1.640	6.0	1.420	6.3
	Reflex	2	SL	0.125	lb ai/a	PRT					
	Gramoxone SL	2	SL	0.5	lb ai/a	PO2DIR					
11	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	9.7	2.447	15.7	3.373	11.7
	Rely 280	2.34	L	0.58	lb ai/a	PO1DIR					
12	Untreated						2.7	0.847	5.7	1.100	4.0
	LSD P=.05						10.62	2.4263	11.45	2.4040	7.60
	Standard Deviation						6.27	1.4328	6.76	1.4196	4.49
	CV						90.65	73.73	52.67	50.61	47.13

Weed Control in Bell Pepper & Tomato - HTRC - 2018

Pest Code							PEPPER	PEPPER	PEPPER	PEPPER	PEPPER
Crop Code							22Aug18	04Sep18	04Sep18	18Sep18	18Sep18
Rating Date							HARVEST	HARVEST	HARVEST	HARVEST	HARVEST
Rating Type							KG/PLOT	NO/PLOT	KG/PLOT	NO./PLOT	KG/PLOT
Rating Unit											
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Unit	Growth Stage					
1	Prowl H20	3.8	CS	1.4	lb ai/a	PRT	1.387	14.3	2.9500	17.7	3.6200
2	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	3.213	16.7	3.2933	13.3	2.4583
	Reflex	2	SL	0.125	lb ai/a	PRT					
3	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	4.620	15.0	3.5250	10.7	2.2883
	Command	3	ME	0.5	lb ai/a	PRT					
4	Tricor	75	DF	0.5	lb ai/a	PPI	0.620	4.7	1.1283	6.3	1.2767
	Treflan	4	EC	1	lb ai/a	PPI					
5	Spartan	4	F	0.25	lb ai/a	PRT	2.100	14.7	2.9200	13.7	2.6567
	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT					
6	Authority MTZ	45	DF	0.338	lb ai/a	PRT	1.700	14.0	2.7233	12.3	2.5850
7	Spartan	4	F	0.25	lb ai/a	PRT	2.280	20.3	4.2200	16.3	3.3133
	Prowl H20	3.8	CS	1.4	lb ai/a	PRT					
8	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	2.893	7.3	1.5417	10.7	2.3450
	Sandea	75	WG	0.023	lb ai/a	PO1DIR					
	Select Max	.97	EC	0.12	lb ai/a	PO1DIR					
9	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	1.180	11.7	2.5233	23.7	4.6317
	Reglone	2	L	0.5	lb ai/a	PO2DIR					
10	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	1.413	13.3	2.5250	10.0	1.9750
	Reflex	2	SL	0.125	lb ai/a	PRT					
	Gramoxone SL	2	SL	0.5	lb ai/a	PO2DIR					
11	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	2.420	15.7	3.3383	21.0	3.9633
	Rely 280	2.34	L	0.58	lb ai/a	PO1DIR					
12	Untreated						0.780	7.3	1.4483	10.3	1.7283
LSD P=.05							1.7135	10.83	2.40750	11.37	2.43559
Standard Deviation							1.0118	6.39	1.42168	6.71	1.43827
CV							49.34	49.5	53.09	48.53	52.55

Weed Control in Bell Pepper & Tomato - HTRC - 2018

Pest Code						PEPPER	PEPPER	PEPPER	PEPPER	TOMATO
Crop Code						02Oct18	02Oct18			22Aug18
Rating Date						HARVEST	HARVEST	TOTAL	TOTAL	HARVEST
Rating Type						NO./PLOT	KG/PLOT	NO./PLOT	KG/PLOT	NO./PLOT
Rating Unit										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Growth Unit Stage					
1	Prowl H20	3.8	CS	1.4 lb ai/a	PRT	40.3	6.7667	99.7	19.89	16.0
2	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	23.3	3.8650	107.3	21.71	53.0
	Reflex	2	SL	0.125 lb ai/a	PRT					
3	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	20.7	3.5117	110.0	23.99	35.0
	Command	3	ME	0.5 lb ai/a	PRT					
4	Tricor	75	DF	0.5 lb ai/a	PPI	6.7	1.1917	23.7	5.05	32.0
	Treflan	4	EC	1 lb ai/a	PPI					
5	Spartan	4	F	0.25 lb ai/a	PRT	17.3	3.0467	74.3	15.25	34.0
	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT					
6	Authority MTZ	45	DF	0.338 lb ai/a	PRT	21.0	3.8383	63.7	13.25	41.7
7	Spartan	4	F	0.25 lb ai/a	PRT	32.7	5.7633	101.7	21.53	24.3
	Prowl H20	3.8	CS	1.4 lb ai/a	PRT					
8	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	24.3	4.5217	79.3	15.72	40.7
	Sandea	75	WG	0.023 lb ai/a	PO1DIR					
	Select Max	.97	EC	0.12 lb ai/a	PO1DIR					
9	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	21.0	3.9167	75.7	16.13	43.7
	Reglone	2	L	0.5 lb ai/a	PO2DIR					
10	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	29.0	4.8683	69.7	13.84	33.7
	Reflex	2	SL	0.125 lb ai/a	PRT					
	Gramoxone SL	2	SL	0.5 lb ai/a	PO2DIR					
11	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	23.7	4.2567	97.3	19.79	40.3
	Rely 280	2.34	L	0.58 lb ai/a	PO1DIR					
12	Untreated					24.0	3.6950	54.0	9.59	30.3
LSD P=.05						17.09	3.01966	32.25	7.113	14.75
Standard Deviation						10.09	1.78318	19.05	4.2005	8.71
CV						42.65	43.46	23.9	25.74	24.62

Weed Control in Bell Pepper & Tomato - HTRC - 2018

Pest Code										
Crop Code		TOMATO TOMATO TOMATO TOMATO TOMATO								
Rating Date		22Aug18 28Aug18 28Aug18 05Sep18 05Sep18								
Rating Type		HARVEST HARVEST HARVEST HARVEST HARVEST								
Rating Unit		KG/PLOT NO./PLOT KG/PLOT NO./PLOT KG/PLOT								
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Growth Unit Stage					
1	Prowl H20	3.8	CS	1.4 lb ai/a	PRT	4.08	38.7	9.56	50.3	11.89
2	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	13.89	84.7	21.50	73.0	16.86
	Reflex	2	SL	0.125 lb ai/a	PRT					
3	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	8.27	62.3	13.50	81.0	18.62
	Command	3	ME	0.5 lb ai/a	PRT					
4	Tricor	75	DF	0.5 lb ai/a	PPI	8.88	41.3	11.01	70.3	17.53
	Treflan	4	EC	1 lb ai/a	PPI					
5	Spartan	4	F	0.25 lb ai/a	PRT	8.01	70.0	17.09	56.7	12.44
	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT					
6	Authority MTZ	45	DF	0.338 lb ai/a	PRT	9.87	53.7	12.98	68.3	15.99
7	Spartan	4	F	0.25 lb ai/a	PRT	5.67	40.7	9.02	41.7	9.19
	Prowl H20	3.8	CS	1.4 lb ai/a	PRT					
8	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	11.38	79.0	20.73	66.0	15.04
	Sandea	75	WG	0.023 lb ai/a	PO1DIR					
	Select Max	.97	EC	0.12 lb ai/a	PO1DIR					
9	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	11.64	73.3	18.09	68.0	15.19
	Reglone	2	L	0.5 lb ai/a	PO2DIR					
10	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	9.05	61.0	15.19	62.3	13.58
	Reflex	2	SL	0.125 lb ai/a	PRT					
	Gramoxone SL	2	SL	0.5 lb ai/a	PO2DIR					
11	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT	10.47	80.7	21.59	73.7	17.66
	Rely 280	2.34	L	0.58 lb ai/a	PO1DIR					
12	Untreated					7.69	39.7	9.71	40.7	8.94
	LSD P=.05					4.218	36.48	8.465	29.44	7.303
	Standard Deviation					2.4911	21.54	4.9988	17.39	4.3131
	CV					27.45	35.66	33.33	27.74	29.93

Weed Control in Bell Pepper & Tomato - HTRC - 2018

Pest Code							TOMATO	TOMATO	TOMATO	TOMATO	TOMATO
Crop Code							13Sep18	13Sep18	21Sep18	21Sep18	27Sep18
Rating Date							HARVEST	HARVEST	HARVEST	HARVEST	HARVEST
Rating Type							NO./PLOT	KG/PLOT	NO./PLOT	KG/PLOT	NO./PLOT
Rating Unit											
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Rate Unit	Growth Stage					
1	Prowl H20	3.8	CS	1.4	lb ai/a	PRT	52.3	14.02	45.9	8.34	29.3
2	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	130.0	28.85	62.7	12.76	48.7
	Reflex	2	SL	0.125	lb ai/a	PRT					
3	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	139.7	22.21	88.7	18.60	46.3
	Command	3	ME	0.5	lb ai/a	PRT					
4	Tricor	75	DF	0.5	lb ai/a	PPI	163.0	30.17	111.3	23.65	63.7
	Treflan	4	EC	1	lb ai/a	PPI					
5	Spartan	4	F	0.25	lb ai/a	PRT	64.0	9.48	29.0	6.29	35.0
	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT					
6	Authority MTZ	45	DF	0.338	lb ai/a	PRT	107.3	21.16	62.7	13.88	49.3
7	Spartan	4	F	0.25	lb ai/a	PRT	80.7	15.31	50.0	11.22	35.3
	Prowl H20	3.8	CS	1.4	lb ai/a	PRT					
8	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	93.7	17.72	49.7	10.36	27.7
	Sandea	75	WG	0.023	lb ai/a	PO1DIR					
	Select Max	.97	EC	0.12	lb ai/a	PO1DIR					
9	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	83.0	19.53	65.3	14.45	46.0
	Reglone	2	L	0.5	lb ai/a	PO2DIR					
10	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	90.3	23.68	74.0	16.33	61.7
	Reflex	2	SL	0.125	lb ai/a	PRT					
	Gramoxone SL	2	SL	0.5	lb ai/a	PO2DIR					
11	Dual Magnum	7.62	EC	0.95	lb ai/a	PRT	106.0	19.59	65.0	14.15	37.7
	Rely 280	2.34	L	0.58	lb ai/a	PO1DIR					
12	Untreated						45.3	15.30	25.0	5.54	29.3
LSD P=.05							38.93	12.736	29.87	6.348	26.84
Standard Deviation							22.99	7.5213	17.59	3.7485	15.85
CV							23.88	38.08	28.94	28.91	37.3

Weed Control in Bell Pepper & Tomato - HTRC - 2018

Pest Code		TOMATO TOMATO TOMATO							
Crop Code		27Sep18							
Rating Date		HARVEST		TOTAL		TOTAL			
Rating Type		KG/PLOT		NO./PLOT		KG/PLOT			
Rating Unit									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Growth Unit	Stage			
1	Prowl H20	3.8	CS	1.4 lb ai/a	PRT		6.89	218.3	54.77
2	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT		10.32	452.0	104.18
	Reflex	2	SL	0.125 lb ai/a	PRT				
3	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT		10.52	453.0	91.70
	Command	3	ME	0.5 lb ai/a	PRT				
4	Tricor	75	DF	0.5 lb ai/a	PPI		13.90	481.7	105.13
	Treflan	4	EC	1 lb ai/a	PPI				
5	Spartan	4	F	0.25 lb ai/a	PRT		8.50	288.7	61.81
	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT				
6	Authority MTZ	45	DF	0.338 lb ai/a	PRT		11.35	383.0	85.22
7	Spartan	4	F	0.25 lb ai/a	PRT		8.48	272.7	58.88
	Prowl H20	3.8	CS	1.4 lb ai/a	PRT				
8	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT		6.16	356.7	81.39
	Sandea	75	WG	0.023 lb ai/a	PO1DIR				
	Select Max	.97	EC	0.12 lb ai/a	PO1DIR				
9	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT		10.52	379.3	89.42
	Reglone	2	L	0.5 lb ai/a	PO2DIR				
10	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT		13.93	383.0	91.76
	Reflex	2	SL	0.125 lb ai/a	PRT				
	Gramoxone SL	2	SL	0.5 lb ai/a	PO2DIR				
11	Dual Magnum	7.62	EC	0.95 lb ai/a	PRT		8.58	403.3	92.04
	Rely 280	2.34	L	0.58 lb ai/a	PO1DIR				
12	Untreated						6.71	210.3	53.90
	LSD P=.05						5.947	120.73	25.415
	Standard Deviation						3.5117	71.29	15.0084
	CV						36.38	19.98	18.56

Weed Control in Pumpkin & Squash - HTRC - 2018

Project Code: 108-18-2

Location: East Lansing, MI
Block 110-111

Personnel: Bernard H. Zandstra, Nicole Soldan

Crop: Pumpkin, Squash Variety: Howden, Burgess Buttercup, Ultra Butternut
 Planting Method: Seeded Planting Date: 6/18/18 Harvest Date: see notes
 Spacing: 6 inch Row Spacing: 5 ft, 1 row each crop/plot
 Tillage Type: Conventional Study Design: RCB Replications: 3
 Plot Size: 16 ft wide x 50 ft long

Soil Type: Marlette fine sandy loam OM: 1.2% pH: 6.3
 Sand: 69% Silt: 20% Clay: 11% CEC: 4.1

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	6/19/18	11:50 AM	72/68	F	Damp	1-6 E	63	100% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
6/19	Pumpkin & Squash		Preemergence	
6/19	No weeds			
	LACG = Large Crabgrass			
	YEFT = Yellow Foxtail			
	COLQ = Common Lambsquarters			
	CORW = Common Ragweed			
	RRPW = Redroot Pigweed			
	WIRA = Wild Radish			

Notes and Comments

1. Spray applied with 12 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 tractor sprayer.
 2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
 3. Buttercup and butternut squash harvested on 9/27/18, 10/3/18, & 10/4/18.
 4. Pumpkins harvested on 9/21/18, 9/28/18, & 10/4/18.
-

Weed Control in Pumpkin & Squash - HTRC - 2018

Michigan State University

Weed Control in Pumpkin & Squash - HTRC - 2018

Trial ID: 108-18-2
Protocol ID: 108-18-2

Location: East Lansing, MI
Investigator: Dr. Bernard Zandstra

Trial Year: 2018

Pest Code								LACG	YEFT	COLQ	
Crop Code											
Crop Name											
Rating Date											
Rating Type											
Rating Unit											
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage	SQUASH BUTCUP	PUMP HOWDEN	SQUASH BUTNUT	05Jul18 RATING	05Jul18 RATING	05Jul18 RATING
				Unit		1-10	1-10	1-10	1-10	1-10	1-10
1	Curbit	3	EC	1.13 lb ai/a	PRE	1.3	1.0	1.3	10.0	10.0	10.0
	Command	3	ME	0.375 lb ai/a	PRE						
2	Strategy	2.1	SE	6 pt/a	PRE	1.3	1.0	1.0	10.0	10.0	9.7
3	Curbit	3	EC	1.13 lb ai/a	PRE	1.7	1.0	1.0	10.0	10.0	10.0
	Command	3	ME	0.375 lb ai/a	PRE						
	Reflex	2	SL	0.125 lb ai/a	PRE						
4	Dual Magnum	7.62	EC	0.126 lb ai/a	PRE	1.7	1.3	1.3	10.0	10.0	10.0
	Command	3	ME	0.375 lb ai/a	PRE						
	Reflex	2	SL	0.125 lb ai/a	PRE						
5	Curbit	3	EC	1.13 lb ai/a	PRE	1.0	1.0	1.0	10.0	10.0	9.0
	Dual Magnum	7.62	EC	1.26 lb ai/a	PRE						
6	Curbit	3	EC	1.13 lb ai/a	PRE	1.0	1.0	1.0	9.7	9.7	9.3
	Dual Magnum	7.62	EC	1.26 lb ai/a	PRE						
	Reflex	2	SL	0.125 lb ai/a	PRE						
7	Curbit	3	EC	1.13 lb ai/a	PRE	1.3	1.7	1.0	9.0	9.3	10.0
	Command	3	ME	0.375 lb ai/a	PRE						
	Sandea	75	WG	0.023 lb ai/a	PRE						
8	Curbit	3	EC	1.13 lb ai/a	PRE	1.3	1.3	2.0	10.0	10.0	10.0
	Command	3	ME	0.375 lb ai/a	PRE						
	BIR	1.67	SL	0.033 lb ai/a	PRE						
9	Curbit	3	EC	1.13 lb ai/a	PRE	1.3	1.7	2.0	10.0	10.0	10.0
	Command	3	ME	0.375 lb ai/a	PRE						
	BIR	1.67	SL	0.045 lb ai/a	PRE						
10	Untreated				PRE	1.3	1.0	1.0	3.0	4.0	1.0
	LSD P=.05					1.00	0.64	0.84	1.91	2.42	0.67
	Standard Deviation					0.58	0.37	0.49	1.12	1.41	0.39
	CV					43.54	30.85	38.44	12.17	15.15	4.38

Weed Control in Pumpkin & Squash - HTRC - 2018

Pest Code					RRPW	WIRA	SQUASH	PUMP	SQUASH		
Crop Code							BUTCUP	HOWDEN	BUTNUT		
Crop Name							18Jul18	18Jul18	18Jul18		
Rating Date					05Jul18	05Jul18	18Jul18	18Jul18	18Jul18		
Rating Type					RATING	RATING	RATING	RATING	RATING		
Rating Unit					1-10	1-10	1-10	1-10	1-10		
Trt	Treatment	Form	Form	Rate	Growth						
No.	Name	Conc	Type	Rate	Unit	Stage					
1	Curbit	3	EC	1.13	lb ai/a	PRE	10.0	9.7	1.0	1.0	1.0
	Command	3	ME	0.375	lb ai/a	PRE					
2	Strategy	2.1	SE	6	pt/a	PRE	10.0	9.0	1.7	1.0	1.0
3	Curbit	3	EC	1.13	lb ai/a	PRE	10.0	10.0	1.7	1.3	1.3
	Command	3	ME	0.375	lb ai/a	PRE					
	Reflex	2	SL	0.125	lb ai/a	PRE					
4	Dual Magnum	7.62	EC	0.126	lb ai/a	PRE	10.0	10.0	1.3	1.3	1.7
	Command	3	ME	0.375	lb ai/a	PRE					
	Reflex	2	SL	0.125	lb ai/a	PRE					
5	Curbit	3	EC	1.13	lb ai/a	PRE	10.0	9.0	1.3	1.0	1.3
	Dual Magnum	7.62	EC	1.26	lb ai/a	PRE					
6	Curbit	3	EC	1.13	lb ai/a	PRE	10.0	9.3	1.0	1.0	1.3
	Dual Magnum	7.62	EC	1.26	lb ai/a	PRE					
	Reflex	2	SL	0.125	lb ai/a	PRE					
7	Curbit	3	EC	1.13	lb ai/a	PRE	10.0	10.0	1.3	1.3	1.7
	Command	3	ME	0.375	lb ai/a	PRE					
	Sandea	75	WG	0.023	lb ai/a	PRE					
8	Curbit	3	EC	1.13	lb ai/a	PRE	10.0	9.3	1.0	1.3	1.3
	Command	3	ME	0.375	lb ai/a	PRE					
	BIR	1.67	SL	0.033	lb ai/a	PRE					
9	Curbit	3	EC	1.13	lb ai/a	PRE	10.0	9.0	1.3	1.0	1.7
	Command	3	ME	0.375	lb ai/a	PRE					
	BIR	1.67	SL	0.045	lb ai/a	PRE					
10	Untreated					PRE	1.0	3.0	1.0	1.0	1.0
	LSD P=.05						0.00	1.40	1.11	0.65	1.01
	Standard Deviation						0.00	0.81	0.65	0.38	0.59
	CV						0.0	9.22	51.07	33.53	44.02

Weed Control in Pumpkin & Squash - HTRC - 2018

Pest Code					YEFT	COLQ	RRPW	WIRA				
Crop Code									SQUASH	SQUASH		
Crop Name									BUTCUP	BUTCUP		
Rating Date					18Jul18	18Jul18	18Jul18	18Jul18	27Sep18	27Sep18		
Rating Type					RATING	RATING	RATING	RATING	HARVEST	HARVEST		
Rating Unit					1-10	1-10	1-10	1-10	NO./PLOT	KG/PLOT		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Unit	Growth Stage						
1	Curbit Command	3	EC	1.13	lb ai/a	PRE	10.0	8.3	8.3	8.3	67.7	98.00
2	Strategy	2.1	SE	6	pt/a	PRE	10.0	9.7	7.7	8.0	55.3	71.51
3	Curbit Command	3	EC	1.13	lb ai/a	PRE	9.7	8.0	9.0	9.3	75.7	106.28
	Reflex	2	SL	0.125	lb ai/a	PRE						
4	Dual Magnum Command	7.62	EC	0.126	lb ai/a	PRE	9.3	9.7	10.0	10.0	71.0	87.34
	Reflex	2	SL	0.125	lb ai/a	PRE						
5	Curbit Dual Magnum	3	EC	1.13	lb ai/a	PRE	9.3	5.3	10.0	8.7	61.3	85.38
	Dual Magnum	7.62	EC	1.26	lb ai/a	PRE						
6	Curbit Dual Magnum	3	EC	1.13	lb ai/a	PRE	9.3	7.0	9.3	7.7	79.3	114.30
	Dual Magnum	7.62	EC	1.26	lb ai/a	PRE						
	Reflex	2	SL	0.125	lb ai/a	PRE						
7	Curbit Command	3	EC	1.13	lb ai/a	PRE	9.0	8.3	8.7	10.0	72.3	94.03
	Command	3	ME	0.375	lb ai/a	PRE						
	Sandea	75	WG	0.023	lb ai/a	PRE						
8	Curbit Command	3	EC	1.13	lb ai/a	PRE	9.3	9.3	7.0	8.7	76.3	109.82
	Command	3	ME	0.375	lb ai/a	PRE						
	BIR	1.67	SL	0.033	lb ai/a	PRE						
9	Curbit Command	3	EC	1.13	lb ai/a	PRE	9.7	10.0	9.0	8.7	76.3	114.00
	Command	3	ME	0.375	lb ai/a	PRE						
	BIR	1.67	SL	0.045	lb ai/a	PRE						
10	Untreated					PRE	3.0	1.7	1.0	1.0	56.0	75.85
	LSD P=.05						2.38	2.69	1.03	1.70	24.52	39.070
	Standard Deviation						1.39	1.57	0.60	0.99	14.29	22.7752
	CV						15.67	20.26	7.49	12.36	20.67	23.81

Weed Control in Pumpkin & Squash - HTRC - 2018

Pest Code	Crop Code	Crop Name	Rating Date	Rating Type	Rating Unit	SQUASH BUTNUT 27Sep18 HARVEST NO./PLOT	SQUASH BUTNUT 27Sep18 HARVEST KG/PLOT	PUMPKIN YELLOW 21Sep18 HARVEST NO./PLOT	PUMPKIN YELLOW 21Sep18 HARVEST KG/PLOT	PUMPKIN GREEN 21Sep18 HARVEST NO./PLOT	PUMPKIN GREEN 21Sep18 HARVEST KG/PLOT
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Form Rate	Rate Unit	Growth Stage				
1	Curbit Command	3 EC		1.13 lb ai/a	PRE	76.3	173.04	33.3	238.60	4.7	19.69
2	Strategy	2.1 SE		6 pt/a	PRE	72.7	171.01	28.3	182.00	1.3	2.49
3	Curbit Command	3 EC		1.13 lb ai/a	PRE	81.0	195.57	30.7	219.96	1.3	7.09
	Reflex	2 SL		0.125 lb ai/a	PRE						
4	Dual Magnum Command	7.62 EC		0.126 lb ai/a	PRE	83.0	199.50	29.0	211.32	1.3	9.31
	Reflex	2 SL		0.125 lb ai/a	PRE						
5	Curbit Dual Magnum	3 EC		1.13 lb ai/a	PRE	73.0	174.08	28.0	193.29	2.7	11.16
	Dual Magnum	7.62 EC		1.26 lb ai/a	PRE						
6	Curbit Dual Magnum	3 EC		1.13 lb ai/a	PRE	86.7	211.64	31.3	216.42	2.3	7.66
	Dual Magnum	7.62 EC		1.26 lb ai/a	PRE						
	Reflex	2 SL		0.125 lb ai/a	PRE						
7	Curbit Command	3 EC		1.13 lb ai/a	PRE	70.3	154.97	27.7	194.63	2.7	15.86
	Command	3 ME		0.375 lb ai/a	PRE						
	Sandea	75 WG		0.023 lb ai/a	PRE						
8	Curbit Command	3 EC		1.13 lb ai/a	PRE	77.3	182.89	29.0	211.92	2.3	11.01
	Command	3 ME		0.375 lb ai/a	PRE						
	BIR	1.67 SL		0.033 lb ai/a	PRE						
9	Curbit Command	3 EC		1.13 lb ai/a	PRE	73.3	167.83	31.0	233.86	3.0	16.55
	Command	3 ME		0.375 lb ai/a	PRE						
	BIR	1.67 SL		0.045 lb ai/a	PRE						
10	Untreated				PRE	61.3	137.06	26.7	178.62	1.7	5.03
	LSD P=.05					24.48	70.442	8.11	56.719	2.11	10.571
	Standard Deviation					14.27	41.0634	4.73	33.0637	1.23	6.1627
	CV					18.9	23.23	16.03	15.89	52.81	58.2

Weed Control in a New Strawberry Planting - HTRC - 2018

Project Code: 124-18-1

Location: East Lansing, MI
Block 122

Personnel: Bernard H. Zandstra, Nicole Soldan
 Crop: Strawberry Variety: Jewel
 Planting Method: Transplanted Planting Date: 5/11/18
 Spacing: 18 inch Row Spacing: 8 ft
 Tillage Type: Conventional Study Design: RCB Replications: 3
 Plot Size: 5.3 ft wide x 30 ft long

Soil Type: Marlette Fine Sandy Loam OM: 1.1% pH: 7.4
 Sand: 48% Silt: 30% Clay: 22% CEC: 6.8

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
POT	5/18	11:15 AM	69/57	F	Damp	5-10 E	43	% Cloudy	N
PO1	6/14	10:30 AM	81/64	F	Dry	2-5 SW	36	% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/18	Strawberry	3-4"	Veg	Good
5/18	BYGR = Barnyardgrass	5"	Veg	Moderate
5/18	YEFT = Yellow Foxtail	1-3"	Veg	Moderate
5/18	COLQ = Common Lambsquarters	1"	Veg	Moderate
5/18	WIRA = Wild Radish	1-2"	Veg	Many
6/14	Strawberry	4-5"	Veg/Some fruit	Good
6/14	BYGR = Barnyardgrass	4-6"	Veg	Moderate
6/14	COLQ = Common Lambsquarters	1-2"	Veg	Few
6/14	COPU = Common Purslane	1-4"	Veg	Few
6/14	CORW = Common Ragweed	4-8"	Veg	Few
6/14	WIRA = Wild Radish	4-12"	Flower	Few
6/14	YEFT = Yellow Foxtail	2-3"	Veg	Few

Notes and Comments

- Spray applied with 4 nozzle boom (POT & PO1) and 2 nozzle shielded boom (PO1 DIR). FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
- Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
- POT = 1-5 DATP; PO1 = 30-40 DAP

Weed Control in a New Strawberry Planting - HTRC - 2018

Michigan State University

Weed Control in a New Strawberry Planting

Trial ID: 124-18-1
Protocol ID: 124-18-1

Location: East Lansing, MI
Investigator: Dr. Bernard Zandstra

Trial Year: 2018

Pest Code					BYGR	CORW	WIRA		BYGR		
Crop Code					STBE			STBE			
Rating Date					07Jun18	07Jun18	07Jun18	19Jun18	19Jun18		
Rating Type					RATING	RATING	RATING	RATING	RATING		
Rating Unit					1-10	1-10	1-10	1-10	1-10		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Growth Stage						
1	Sinbar	80	WDG	0.1 lb ai/a	POT	1.3	7.7	10.0	9.0	1.0	5.3
2	Devrinol DF-XT	50	DF	6 lb ai/a	POT	1.0	9.7	8.7	5.0	1.7	10.0
3	Spartan	4	F	0.25 lb ai/a	POT	1.0	9.3	10.0	3.7	1.7	4.3
4	Prowl H2O	3.8	CS	1.4 lb ai/a	POT	1.3	8.7	7.7	6.0	1.0	7.7
5	Dual Magnum	7.62	EC	1.26 lb ai/a	POT	1.0	10.0	5.7	2.0	1.0	10.0
6	Devrinol DF-XT	50	DF	6 lb ai/a	POT	1.3	10.0	8.7	3.0	3.7	8.3
	Sinbar	80	WDG	0.2 lb ai/a	PO1						
	Select Max	0.97	EC	0.12 lb ai/a	PO1						
7	Trellis SC	4.17	SC	1 lb ai/a	POT	2.7	6.0	10.0	10.0	3.7	3.7
8	Devrinol DF-XT	50	DF	6 lb ai/a	POT	1.7	10.0	6.7	4.3	1.3	9.3
	Quinstar	4	L	0.25 lb ai/a	PO1DIR						
	COC	100	SL	1 % v/v	PO1DIR						
9	Untreated					1.0	1.0	1.0	1.0	2.0	1.3
10	Devrinol DF-XT	50	DF	6 lb ai/a	POT	1.3	10.0	10.0	9.0	2.7	9.7
	Sinbar	80	WDG	0.1 lb ai/a	POT						
	LSD P=.05					0.72	1.90	3.77	1.79	1.73	2.97
	Standard Deviation					0.42	1.10	2.20	1.04	1.01	1.73
	CV					30.53	13.37	28.04	19.66	51.32	24.88

Pest Code						CORW	WIRA		YEFT		
Crop Code								STBE	STBE		
Rating Date						19Jun18	19Jun18	03Jul18	03Jul18		
Rating Type						RATING	RATING	RATING	RATING		
Rating Unit						1-10	1-10	1-10	1-10		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Growth Stage						
1	Sinbar	80	WDG	0.1 lb ai/a	POT	8.3	8.7	1.0	2.0	1.3	2.0
2	Devrinol DF-XT	50	DF	6 lb ai/a	POT	9.0	2.3	2.0	6.7	2.0	1.3
3	Spartan	4	F	0.25 lb ai/a	POT	7.3	6.7	2.3	1.3	2.3	2.7
4	Prowl H2O	3.8	CS	1.4 lb ai/a	POT	3.0	4.7	1.7	4.7	2.3	2.3
5	Dual Magnum	7.62	EC	1.26 lb ai/a	POT	4.0	3.7	1.0	4.0	1.7	1.3
6	Devrinol DF-XT	50	DF	6 lb ai/a	POT	7.3	4.3	4.3	5.7	5.3	4.3
	Sinbar	80	WDG	0.2 lb ai/a	PO1						
	Select Max	0.97	EC	0.12 lb ai/a	PO1						
7	Trellis SC	4.17	SC	1 lb ai/a	POT	10.0	10.0	4.0	4.3	5.7	3.7
8	Devrinol DF-XT	50	DF	6 lb ai/a	POT	6.3	1.7	2.7	7.0	2.3	1.7
	Quinstar	4	L	0.25 lb ai/a	PO1DIR						
	COC	100	SL	1 % v/v	PO1DIR						
9	Untreated					4.0	1.0	1.7	1.0	2.3	1.7
10	Devrinol DF-XT	50	DF	6 lb ai/a	POT	10.0	8.7	2.7	8.0	3.3	4.0
	Sinbar	80	WDG	0.1 lb ai/a	POT						
	LSD P=.05					5.04	2.95	1.47	3.16	2.26	2.40
	Standard Deviation					2.94	1.72	0.85	1.84	1.32	1.40
	CV					42.38	33.3	36.61	41.3	45.88	55.88

Weed Control in Apple - CRC - 2018

Project Code: 128-18-1

Location: Clarksville, MI
Tier 2

Personnel: Bernard H. Zandstra, Nicole Soldan

Crop: Apple Variety: See notes

Planting Method: Transplant Planting Date: 2003-2007

Spacing: 4-6 ft Row Spacing: 15 ft

Tillage Type: Conventional Study Design: RCB

Replications: 3

Plot Size: 11 ft wide x 50 ft long

Soil Type: Lapeer Sandy Loam

OM: 2.3%

pH: 6.1

Sand: 39%

Silt: 40%

Clay: 21%

CEC: 5.3

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	4/23	10:30 AM	52/43	F	Dry	7-9 NE	43	20% Cloudy	N
PO1	6/5	1:40 PM	70/71	F	Wet	2-6 W	44	30% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/23	APPLE	10-15'	Bud swell	Good
4/23	ANBG = Annual Bluegrass	1-3"	Veg	Moderate
4/23	DAND = Dandelion	2-3"	Veg	Moderate
4/23	COCW = Common Chickweed	2-3"	Veg	Moderate
4/23	ROCI = Rough Cinquefoil	3-4"	3-6 Leaves	Moderate
4/23	RSFI = Redstem Filaree	3-4"	Flower	Moderate
4/23	WHCL = White Clover	3-4"	Veg	Many
4/23	WICA = Wild Carrot	1-2"	3-5 Leaves	Few
6/5	APPLE	10-15'	Early Fruit	Good
6/5	ANBG = Annual Bluegrass	8-12"	Veg	Moderate
6/5	BLDO = Broadleaf Dock	10"	Veg	Few
6/5	CUDO = Curly Dock	18"	Seed set	Moderate
6/5	DAND = Dandelion	4-5"	Flower	Moderate
6/5	WHCL = White Clover	2-6"	Veg/Flower	Many
6/5	WICA = Wild Carrot	4-8"	Veg	Moderate
	DOBG = Downy Bromegrass			
	FAPA = Fall Panicum			
	REFE = Red Fescue			
	BHPL = Buckhorn Plantain			
	BLME = Black Medic			
	PRKW = Prostrate Knotweed			

Notes and Comments

1. Spray applied with 4 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer. One pass on each side of row.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
3. PRE = April 1-15; PO1 = June 10-20
4. Varieties: Red Delicious, Brookfield Gala, Fuji

Weed Control in Apple - CRC - 2018

Michigan State University

Weed Control in Apple - CRC - 2018

Trial ID: 128-18-1

Location: Clarksville, MI

Trial Year: 2018

Protocol ID: 128-18-1

Investigator: Dr. Bernard Zandstra

Pest Code	DOBG	REFE	BLME	CUDO	DAND
Crop Code	APPLE				
Rating Date	04Jun18	04Jun18	04Jun18	04Jun18	04Jun18
Rating Type	RATING	RATING	RATING	RATING	RATING
Rating Unit	1-10	1-10	1-10	1-10	1-10

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	DOBG	REFE	BLME	CUDO	DAND	
1	Untreated Check					PRE	1.0	3.3	6.0	7.0	4.0	3.0
2	Alion 200	1.67	SC	0.065	lb ai/a	PRE	1.0	10.0	9.3	7.3	10.0	7.3
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
	Ammonium Sulfate	100	SG	3.4	lb ai/a	PRE						
3	Alion 200	1.67	SC	0.065	lb ai/a	PRE	1.0	10.0	9.3	10.0	7.7	7.7
	Karmex	80	DF	3	lb ai/a	PRE						
	Rely 280	2.34	L	1	lb ai/a	PRE						
	NIS	100	SL	0.25	% v/v	PRE						
4	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	1.0	10.0	10.0	10.0	3.3	8.3
	Surflan	4	L	4	lb ai/a	PRE						
	Karmex	80	DF	0.93	lb ai/a	PRE						
	Gramoxone SL	2	SL	0.6	lb ai/a	PRE						
5	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	1.0	10.0	10.0	10.0	8.0	8.0
	Surflan	4	L	4	lb ai/a	PRE						
	Sinbar	80	WDG	1	lb ai/a	PRE						
	Gramoxone SL	2	SL	0.6	lb ai/a	PRE						
6	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	1.3	10.0	7.7	10.0	3.0	7.3
	Surflan	4	L	4	lb ai/a	PRE						
	Callisto	4	SC	0.188	lb ai/a	PRE						
	Gramoxone SL	2	SL	0.6	lb ai/a	PRE						
7	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	1.0	10.0	10.0	9.0	3.0	8.3
	Matrix	25	DF	0.063	lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
8	Chateau SW	51	WDG	0.383	lb ai/a	PRE	1.3	10.0	9.7	10.0	6.3	8.7
	Karmex	80	DF	3	lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
9	Goal 2XL	2	EC	2	lb ai/a	PRE	1.0	9.3	9.7	10.0	8.0	9.7
	Karmex	80	DF	3	lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
	Quinstar	3.8	L	0.375	lb ai/a	PO1						
	COC	100	SL	1	% v/v	PO1						
10	Princep	90	WDG	4	lb ai/a	PRE	1.0	10.0	8.7	10.0	6.0	7.3
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
	Starane Ultra	2.8	L	0.5	lb ai/a	PO1						
	Select Max	0.97	EC	0.12	lb ai/a	PO1						
11	Princep	90	WDG	4	lb ai/a	PRE	1.0	10.0	9.0	8.7	6.0	6.3
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PO1						
	Venue	0.177	SC	0.0055	lb ai/a	PO1						
	N Pak (AMS)	100	L	2.5	% v/v	PO1						
12	Princep	90	WDG	4	lb ai/a	PRE	1.0	10.0	8.3	10.0	6.3	8.3
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
	Treevix	70	WG	0.044	lb ai/a	PO1						
	Venue	0.177	SC	0.0055	lb ai/a	PO1						
	NIS	100	SL	0.25	% v/v	PO1						
	LSD P=.05						0.41	2.03	2.58	3.11	4.98	3.10
	Standard Deviation						0.24	1.20	1.52	1.84	2.94	1.83
	CV						22.83	12.77	16.99	19.67	49.24	24.33

Weed Control in Apple - CRC - 2018

Pest Code			WICA	WHCL	APPLE		DAND	WHCL	WICA			
Crop Code			04Jun18	04Jun18	25Jun18	25Jun18	25Jun18	25Jun18	25Jun18			
Rating Date			RATING	RATING	RATING	RATING	RATING	RATING	RATING			
Rating Type			1-10	1-10	1-10	1-10	1-10	1-10	1-10			
Rating Unit												
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage						
1	Untreated Check					PRE	6.3	1.0	1.0	1.7	1.0	7.0
2	Alion 200	1.67	SC	0.065	lb ai/a	PRE	10.0	8.0	1.0	9.0	5.0	9.0
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
	Ammonium Sulfate	100	SG	3.4	lb ai/a	PRE						
3	Alion 200	1.67	SC	0.065	lb ai/a	PRE	8.7	10.0	1.0	9.0	10.0	9.0
	Karmex	80	DF	3	lb ai/a	PRE						
	Rely 280	2.34	L	1	lb ai/a	PRE						
	NIS	100	SL	0.25	% v/v	PRE						
4	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	9.3	9.7	1.0	8.7	9.3	9.3
	Surflan	4	L	4	lb ai/a	PRE						
	Karmex	80	DF	0.93	lb ai/a	PRE						
	Gramoxone SL	2	SL	0.6	lb ai/a	PRE						
5	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	10.0	10.0	1.0	6.7	10.0	10.0
	Surflan	4	L	4	lb ai/a	PRE						
	Sinbar	80	WDG	1	lb ai/a	PRE						
	Gramoxone SL	2	SL	0.6	lb ai/a	PRE						
6	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	9.7	8.7	1.0	10.0	9.3	10.0
	Surflan	4	L	4	lb ai/a	PRE						
	Callisto	4	SC	0.188	lb ai/a	PRE						
	Gramoxone SL	2	SL	0.6	lb ai/a	PRE						
7	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	10.0	8.7	1.0	10.0	7.0	10.0
	Matrix	25	DF	0.063	lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
8	Chateau SW	51	WDG	0.383	lb ai/a	PRE	9.3	10.0	1.0	9.7	10.0	9.7
	Karmex	80	DF	3	lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
9	Goal 2XL	2	EC	2	lb ai/a	PRE	9.3	10.0	1.0	10.0	10.0	10.0
	Karmex	80	DF	3	lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
	Quinstar	3.8	L	0.375	lb ai/a	PO1						
	COC	100	SL	1	% v/v	PO1						
10	Princep	90	WDG	4	lb ai/a	PRE	9.3	9.3	1.0	10.0	10.0	10.0
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
	Starane Ultra	2.8	L	0.5	lb ai/a	PO1						
	Select Max	0.97	EC	0.12	lb ai/a	PO1						
11	Princep	90	WDG	4	lb ai/a	PRE	9.3	8.3	1.0	10.0	9.7	10.0
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PO1						
	Venue	0.177	SC	0.0055	lb ai/a	PO1						
	N Pak (AMS)	100	L	2.5	% v/v	PO1						
12	Princep	90	WDG	4	lb ai/a	PRE	7.7	10.0	1.0	9.7	10.0	9.3
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
	Treevix	70	WG	0.044	lb ai/a	PO1						
	Venue	0.177	SC	0.0055	lb ai/a	PO1						
	NIS	100	SL	0.25	% v/v	PO1						
	LSD P=.05						3.26	1.69	0.00	3.04	3.01	2.70
	Standard Deviation						1.92	1.00	0.00	1.80	1.77	1.59
	CV						21.19	11.56	0.0	20.65	21.01	16.86

Weed Control in Apple - CRC - 2018

Pest Code						BYGR	BHPL	BRPL	DAND	PRKW		
Crop Code						APPLE						
Rating Date						11Jul08	11Jul18	11Jul18	11Jul18	11Jul18	11Jul18	
Rating Type						RATING	RATING	RATING	RATING	RATING	RATING	
Rating Unit						1-10	1-10	1-10	1-10	1-10	1-10	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage						
1	Untreated Check					PRE	1.0	5.7	6.0	7.7	3.3	4.0
2	Alion 200	1.67	SC	0.065	lb ai/a	PRE	1.0	8.7	10.0	9.3	8.0	8.3
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
	Ammonium Sulfate	100	SG	3.4	lb ai/a	PRE						
3	Alion 200	1.67	SC	0.065	lb ai/a	PRE	1.0	10.0	10.0	7.3	9.3	10.0
	Karmex	80	DF	3	lb ai/a	PRE						
	Rely 280	2.34	L	1	lb ai/a	PRE						
	NIS	100	SL	0.25	% v/v	PRE						
4	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	1.0	10.0	10.0	9.7	5.7	10.0
	Surflan	4	L	4	lb ai/a	PRE						
	Karmex	80	DF	0.93	lb ai/a	PRE						
	Gramoxone SL	2	SL	0.6	lb ai/a	PRE						
5	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	1.0	9.0	10.0	8.3	7.3	10.0
	Surflan	4	L	4	lb ai/a	PRE						
	Sinbar	80	WDG	1	lb ai/a	PRE						
	Gramoxone SL	2	SL	0.6	lb ai/a	PRE						
6	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	1.0	9.0	10.0	10.0	9.0	10.0
	Surflan	4	L	4	lb ai/a	PRE						
	Callisto	4	SC	0.188	lb ai/a	PRE						
	Gramoxone SL	2	SL	0.6	lb ai/a	PRE						
7	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	1.0	8.7	8.7	6.7	8.3	6.7
	Matrix	25	DF	0.063	lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
8	Chateau SW	51	WDG	0.383	lb ai/a	PRE	1.0	9.7	10.0	10.0	8.7	10.0
	Karmex	80	DF	3	lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
9	Goal 2XL	2	EC	2	lb ai/a	PRE	1.0	10.0	9.7	7.0	9.3	10.0
	Karmex	80	DF	3	lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
	Quinstar	3.8	L	0.375	lb ai/a	PO1						
	COC	100	SL	1	% v/v	PO1						
10	Princep	90	WDG	4	lb ai/a	PRE	1.0	9.3	10.0	10.0	10.0	10.0
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
	Starane Ultra	2.8	L	0.5	lb ai/a	PO1						
	Select Max	0.97	EC	0.12	lb ai/a	PO1						
11	Princep	90	WDG	4	lb ai/a	PRE	1.0	9.0	10.0	10.0	10.0	10.0
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PO1						
	Venue	0.177	SC	0.0055	lb ai/a	PO1						
	N Pak (AMS)	100	L	2.5	% v/v	PO1						
12	Princep	90	WDG	4	lb ai/a	PRE	1.0	8.0	10.0	10.0	9.0	10.0
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
	Treevix	70	WG	0.044	lb ai/a	PO1						
	Venue	0.177	SC	0.0055	lb ai/a	PO1						
	NIS	100	SL	0.25	% v/v	PO1						
	LSD P=.05						0.00	2.95	2.33	3.95	3.27	2.78
	Standard Deviation						0.00	1.74	1.38	2.33	1.93	1.64
	CV						0.0	19.52	14.43	26.42	23.64	18.05

Weed Control in Apple - CRC - 2018

Pest Code		WHCL	WICA	FAPA	YEFT	COMA				
Crop Code		APPLE								
Rating Date		11Jul18	11Jul18	23Jul18	23Jul18	23Jul18				
Rating Type		RATING	RATING	RATING	RATING	RATING				
Rating Unit		1-10	1-10	1-10	1-10	1-10				
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Unit	Stage				
1	Untreated Check					PRE				
2	Alion 200	1.67	SC	0.065 lb ai/a		PRE				
	Roundup PowerMax	5.5	L	1.0 lb ai/a		PRE				
	Ammonium Sulfate	100	SG	3.4 lb ai/a		PRE				
3	Alion 200	1.67	SC	0.065 lb ai/a		PRE				
	Karmex	80	DF	3 lb ai/a		PRE				
	Rely 280	2.34	L	1 lb ai/a		PRE				
	NIS	100	SL	0.25 % v/v		PRE				
4	Zeus Prime XC	3.5	EC	0.22 lb ai/a		PRE				
	Surflan	4	L	4 lb ai/a		PRE				
	Karmex	80	DF	0.93 lb ai/a		PRE				
	Gramoxone SL	2	SL	0.6 lb ai/a		PRE				
5	Zeus Prime XC	3.5	EC	0.22 lb ai/a		PRE				
	Surflan	4	L	4 lb ai/a		PRE				
	Sinbar	80	WDG	1 lb ai/a		PRE				
	Gramoxone SL	2	SL	0.6 lb ai/a		PRE				
6	Zeus Prime XC	3.5	EC	0.22 lb ai/a		PRE				
	Surflan	4	L	4 lb ai/a		PRE				
	Callisto	4	SC	0.188 lb ai/a		PRE				
	Gramoxone SL	2	SL	0.6 lb ai/a		PRE				
7	Zeus Prime XC	3.5	EC	0.22 lb ai/a		PRE				
	Matrix	25	DF	0.063 lb ai/a		PRE				
	Roundup PowerMax	5.5	L	1.0 lb ai/a		PRE				
8	Chateau SW	51	WDG	0.383 lb ai/a		PRE				
	Karmex	80	DF	3 lb ai/a		PRE				
	Roundup PowerMax	5.5	L	1.0 lb ai/a		PRE				
9	Goal 2XL	2	EC	2 lb ai/a		PRE				
	Karmex	80	DF	3 lb ai/a		PRE				
	Roundup PowerMax	5.5	L	1.0 lb ai/a		PRE				
	Quinstar	3.8	L	0.375 lb ai/a		PO1				
	COC	100	SL	1 % v/v		PO1				
10	Princep	90	WDG	4 lb ai/a		PRE				
	Roundup PowerMax	5.5	L	1.0 lb ai/a		PRE				
	Starane Ultra	2.8	L	0.5 lb ai/a		PO1				
	Select Max	0.97	EC	0.12 lb ai/a		PO1				
11	Princep	90	WDG	4 lb ai/a		PRE				
	Roundup PowerMax	5.5	L	1.0 lb ai/a		PRE				
	Roundup PowerMax	5.5	L	1.0 lb ai/a		PO1				
	Venue	0.177	SC	0.0055 lb ai/a		PO1				
	N Pak (AMS)	100	L	2.5 % v/v		PO1				
12	Princep	90	WDG	4 lb ai/a		PRE				
	Roundup PowerMax	5.5	L	1.0 lb ai/a		PRE				
	Treevix	70	WG	0.044 lb ai/a		PO1				
	Venue	0.177	SC	0.0055 lb ai/a		PO1				
	NIS	100	SL	0.25 % v/v		PO1				
	LSD P=.05				2.50	2.83	0.00	4.48	4.84	3.14
	Standard Deviation				1.47	1.67	0.00	2.64	2.85	1.85
	CV				17.69	18.32	0.0	31.92	35.07	20.11

Weed Control in Apple - CRC - 2018

Pest Code	CUDO	DAND	PRKW	WHCL	WICA	APPLE						
Crop Code												
Rating Date	23Jul18	23Jul18	23Jul18	23Jul18	23Jul18	30Aug18						
Rating Type	RATING	RATING	RATING	RATING	RATING	RATING						
Rating Unit	1-10	1-10	1-10	1-10	1-10	1-10						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage						
1	Untreated Check					PRE	1.0	1.7	7.0	1.0	6.3	1.0
2	Alion 200	1.67	SC	0.065	lb ai/a	PRE	8.3	7.7	6.3	5.7	9.3	1.3
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
	Ammonium Sulfate	100	SG	3.4	lb ai/a	PRE						
3	Alion 200	1.67	SC	0.065	lb ai/a	PRE	8.7	8.7	10.0	10.0	9.0	1.0
	Karmex	80	DF	3	lb ai/a	PRE						
	Rely 280	2.34	L	1	lb ai/a	PRE						
	NIS	100	SL	0.25	% v/v	PRE						
4	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	8.0	7.0	9.7	9.7	8.7	1.0
	Surflan	4	L	4	lb ai/a	PRE						
	Karmex	80	DF	0.93	lb ai/a	PRE						
	Gramoxone SL	2	SL	0.6	lb ai/a	PRE						
5	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	8.3	5.3	10.0	10.0	10.0	1.0
	Surflan	4	L	4	lb ai/a	PRE						
	Sinbar	80	WDG	1	lb ai/a	PRE						
	Gramoxone SL	2	SL	0.6	lb ai/a	PRE						
6	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	4.3	9.3	10.0	7.5	9.3	1.0
	Surflan	4	L	4	lb ai/a	PRE						
	Callisto	4	SC	0.188	lb ai/a	PRE						
	Gramoxone SL	2	SL	0.6	lb ai/a	PRE						
7	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	6.0	8.7	4.0	5.7	9.3	1.0
	Matrix	25	DF	0.063	lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
8	Chateau SW	51	WDG	0.383	lb ai/a	PRE	9.3	9.0	10.0	10.0	9.0	1.0
	Karmex	80	DF	3	lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
9	Goal 2XL	2	EC	2	lb ai/a	PRE	6.7	9.7	10.0	10.0	10.0	1.0
	Karmex	80	DF	3	lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
	Quinstar	3.8	L	0.375	lb ai/a	PO1						
	COC	100	SL	1	% v/v	PO1						
10	Princep	90	WDG	4	lb ai/a	PRE	9.7	9.0	10.0	10.0	10.0	1.0
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
	Starane Ultra	2.8	L	0.5	lb ai/a	PO1						
	Select Max	0.97	EC	0.12	lb ai/a	PO1						
11	Princep	90	WDG	4	lb ai/a	PRE	10.0	10.0	10.0	10.0	10.0	1.0
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PO1						
	Venue	0.177	SC	0.0055	lb ai/a	PO1						
	N Pak (AMS)	100	L	2.5	% v/v	PO1						
12	Princep	90	WDG	4	lb ai/a	PRE	7.7	8.7	8.7	10.0	9.3	1.0
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE						
	Treevix	70	WG	0.044	lb ai/a	PO1						
	Venue	0.177	SC	0.0055	lb ai/a	PO1						
	NIS	100	SL	0.25	% v/v	PO1						
	LSD P=.05						3.13	3.17	3.86	3.37	2.58	0.29
	Standard Deviation						1.84	1.87	2.27	1.98	1.52	0.17
	CV						25.1	23.67	25.83	23.9	16.55	16.49

Weed Control in Apple - CRC - 2018

Pest Code		FAPA	YEFT	BLDO	COMA	CUDO	DAND
Crop Code		30Aug18	30Aug18	30Aug18	30Aug18	30Aug18	30Aug18
Rating Date		RATING	RATING	RATING	RATING	RATING	RATING
Rating Type		1-10	1-10	1-10	1-10	1-10	1-10
Rating Unit							
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	
1	Untreated Check					PRE	9.3
2	Alion 200	1.67	SC	0.065	lb ai/a	PRE	7.0
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE	6.7
	Ammonium Sulfate	100	SG	3.4	lb ai/a	PRE	8.7
3	Alion 200	1.67	SC	0.065	lb ai/a	PRE	9.0
	Karmex	80	DF	3	lb ai/a	PRE	10.0
	Rely 280	2.34	L	1	lb ai/a	PRE	7.3
	NIS	100	SL	0.25	% v/v	PRE	7.0
4	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	10.0
	Surflan	4	L	4	lb ai/a	PRE	9.0
	Karmex	80	DF	0.93	lb ai/a	PRE	4.7
	Gramoxone SL	2	SL	0.6	lb ai/a	PRE	10.0
5	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	10.0
	Surflan	4	L	4	lb ai/a	PRE	7.7
	Sinbar	80	WDG	1	lb ai/a	PRE	8.0
	Gramoxone SL	2	SL	0.6	lb ai/a	PRE	9.0
6	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	9.7
	Surflan	4	L	4	lb ai/a	PRE	8.6
	Callisto	4	SC	0.188	lb ai/a	PRE	1.0
	Gramoxone SL	2	SL	0.6	lb ai/a	PRE	9.7
7	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	7.0
	Matrix	25	DF	0.063	lb ai/a	PRE	6.0
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE	5.3
8	Chateau SW	51	WDG	0.383	lb ai/a	PRE	7.0
	Karmex	80	DF	3	lb ai/a	PRE	6.0
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE	5.3
9	Goal 2XL	2	EC	2	lb ai/a	PRE	7.0
	Karmex	80	DF	3	lb ai/a	PRE	6.0
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE	5.3
	Quinstar	3.8	L	0.375	lb ai/a	PO1	5.3
	COC	100	SL	1	% v/v	PO1	4.7
10	Princep	90	WDG	4	lb ai/a	PRE	7.0
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE	9.3
	Starane Ultra	2.8	L	0.5	lb ai/a	PO1	10.0
	Select Max	0.97	EC	0.12	lb ai/a	PO1	10.0
11	Princep	90	WDG	4	lb ai/a	PRE	7.3
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE	9.3
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PO1	10.0
	Venue	0.177	SC	0.0055	lb ai/a	PO1	8.0
	N Pak (AMS)	100	L	2.5	% v/v	PO1	7.3
12	Princep	90	WDG	4	lb ai/a	PRE	7.0
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE	9.0
	Treevix	70	WG	0.044	lb ai/a	PO1	6.3
	Venue	0.177	SC	0.0055	lb ai/a	PO1	10.0
	NIS	100	SL	0.25	% v/v	PO1	8.3
	LSD P=.05						4.76
	Standard Deviation						4.69
	CV						5.20
							4.52
							3.74
							3.05
							2.81
							2.76
							3.06
							2.66
							2.20
							1.80
							32.16
							34.55
							47.95
							30.79
							33.98
							26.18

Weed Control in Apple - CRC - 2018

Pest Code		WHCL	WICA					
Crop Code								
Rating Date		30Aug18	30Aug18					
Rating Type		RATING	RATING					
Rating Unit		1-10	1-10					
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Unit	Growth Stage		
1	Untreated Check					PRE	1.7	8.7
2	Alion 200	1.67	SC	0.065	lb ai/a	PRE	4.0	8.0
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE		
	Ammonium Sulfate	100	SG	3.4	lb ai/a	PRE		
3	Alion 200	1.67	SC	0.065	lb ai/a	PRE	10.0	8.7
	Karmex	80	DF	3	lb ai/a	PRE		
	Rely 280	2.34	L	1	lb ai/a	PRE		
	NIS	100	SL	0.25	% v/v	PRE		
4	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	8.7	8.3
	Surflan	4	L	4	lb ai/a	PRE		
	Karmex	80	DF	0.93	lb ai/a	PRE		
	Gramoxone SL	2	SL	0.6	lb ai/a	PRE		
5	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	9.7	9.3
	Surflan	4	L	4	lb ai/a	PRE		
	Sinbar	80	WDG	1	lb ai/a	PRE		
	Gramoxone SL	2	SL	0.6	lb ai/a	PRE		
6	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	8.7	10.0
	Surflan	4	L	4	lb ai/a	PRE		
	Callisto	4	SC	0.188	lb ai/a	PRE		
	Gramoxone SL	2	SL	0.6	lb ai/a	PRE		
7	Zeus Prime XC	3.5	EC	0.22	lb ai/a	PRE	6.7	9.3
	Matrix	25	DF	0.063	lb ai/a	PRE		
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE		
8	Chateau SW	51	WDG	0.383	lb ai/a	PRE	10.0	8.7
	Karmex	80	DF	3	lb ai/a	PRE		
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE		
9	Goal 2XL	2	EC	2	lb ai/a	PRE	10.0	9.3
	Karmex	80	DF	3	lb ai/a	PRE		
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE		
	Quinstar	3.8	L	0.375	lb ai/a	PO1		
	COC	100	SL	1	% v/v	PO1		
10	Princep	90	WDG	4	lb ai/a	PRE	10.0	10.0
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE		
	Starane Ultra	2.8	L	0.5	lb ai/a	PO1		
	Select Max	0.97	EC	0.12	lb ai/a	PO1		
11	Princep	90	WDG	4	lb ai/a	PRE	7.7	10.0
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE		
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PO1		
	Venue	0.177	SC	0.0055	lb ai/a	PO1		
	N Pak (AMS)	100	L	2.5	% v/v	PO1		
12	Princep	90	WDG	4	lb ai/a	PRE	9.3	9.3
	Roundup PowerMax	5.5	L	1.0	lb ai/a	PRE		
	Treevix	70	WG	0.044	lb ai/a	PO1		
	Venue	0.177	SC	0.0055	lb ai/a	PO1		
	NIS	100	SL	0.25	% v/v	PO1		
	LSD P=.05						3.51	2.15
	Standard Deviation						2.07	1.27
	CV						25.74	13.84

Weed Control in Apple - HTRC - 2018

Project Code: 128-18-2

Location: East Lansing, MI
Block 153,154,159,160

Personnel: Bernard H. Zandstra, Nicole Soldan
 Crop: Apple Variety: See Notes
 Planting Method: Transplant Planting Date: 2006
 Spacing: 12 ft; 3 trees/plot Row Spacing: 18 ft
 Tillage Type: No Till Study Design: RCB Replications: 3
 Plot Size: 11 ft wide x 50 ft long

Soil Type: Marlette Fine Sandy Loam OM: 2.2% pH: 7.0
 Sand: 46% Silt: 29% Clay: 25% CEC: 9.9

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	4/10	10:30 AM	38/35	F	Damp	3-4 NW	51	50% Cloudy	Y
PO1	6/8	3:20 PM	82/71	F	Dry	6 N	40	50% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/10	Apple	10-12'	Dormant	
4/10	ANBG = Annual Bluegrass	1-2"	Cotyledon	Moderate
4/10	QUGR = Quackgrass	1-3"	Slight green	Few
4/10	COMA = Common Mallow	1-3"	2-3 Leaves	Few
4/10	YERO = Yellow Rocket	2-3"	Some green	Moderate
6/8	Apple	10-12'	Early fruit	Good
6/8	ORGR = Orchardgrass	12"	Seed set	Moderate
6/8	BFTF = Birdsfoot Trefoil	12"	Flower	Moderate
6/8	CUDO = Curly Dock	12"	Seed set	Few
6/8	DAND = Dandelion	6-24"	Flower	Many
6/8	FIPC = Field Pennycress	12"	Veg	Moderate
6/8	GORO = Goldenrod	24"	Veg	Moderate
6/8	PEST = Perennial Sowthistle	8"	Veg	Moderate
6/8	WICA = Wild Carrot	6-12"	Veg	Moderate
6/8	YENS = Yellow Nutsedge	6"	Veg	Few
6/8	YERO = Yellow Rocket	10-12"	Flower	Few
	ALFA = Alfalfa			
	YEFT = Yellow Foxtail			
	PRKW = Prostrate Knotweed			
	BHPL = Buckhorn Plantain			
	WIBW = Wild Buckwheat			

Notes and Comments

1. Spray applied with 4 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer. One pass on each side of row.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
3. Varieties: Spartan, Auvil Early Fuji, Pacific Gala, Honeycrisp, LuckyJon
4. GF3335 is choline salt of 2,4-D

Weed Control in Apple - HTRC - 2018

Michigan State University

Weed Control in Apple - HTRC - 2018

Trial ID: 128-18-2
Protocol ID: 128-18-2

Location: East Lansing, MI
Investigator: Dr. Bernard Zandstra

Trial Year: 2018

Pest Code	Crop Code	Rating Date	Rating Type	Rating Unit	APPLE						
					ALFA	COMA	DAND	FIPC	WICA		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage	31May18 RATING 1-10	31May18 RATING 1-10	31May18 RATING 1-10	31May18 RATING 1-10	31May18 RATING 1-10	31May18 RATING 1-10
1	Karmex	80	DF	4 lb ai/a	PRE	1.0	7.7	10.0	7.3	10.0	3.3
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
2	Alion 200	1.67	SC	0.065 lb ai/a	PRE	1.0	7.0	7.0	4.3	4.7	3.7
	Rely 280	2.34	L	1.17 lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
	Ammonium Sulfate	100	SG	3.4 lb ai/a	PRE						
3	Matrix	25	DF	0.063 lb ai/a	PRE	1.0	10.0	10.0	9.0	6.0	6.3
	Alion 200	1.67	SC	0.065 lb ai/a	PRE						
	COC	100	SL	1 % v/v	PRE						
4	Matrix	25	DF	0.063 lb ai/a	PRE	1.0	10.0	10.0	7.7	10.0	7.0
	Alion 200	1.67	SC	0.065 lb ai/a	PRE						
	Rely 280	2.34	L	0.88 lb ai/a	PRE						
	NIS	100	SL	0.25 % v/v	PRE						
5	Matrix	25	DF	0.063 lb ai/a	PRE	1.0	10.0	8.0	9.7	8.3	9.0
	Alion 200	1.67	SC	0.065 lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
6	Zeus Prime XC	3.5	EC	0.164 lb ai/a	PRE	1.0	10.0	10.0	9.0	7.7	5.7
	Matrix	25	DF	0.063 lb ai/a	PRE						
	Rely 280	2.34	L	0.88 lb ai/a	PRE						
7	Karmex	80	DF	4 lb ai/a	PRE	1.0	7.7	7.0	5.7	8.7	4.7
	Quinstar	3.8	L	0.37 lb ai/a	PO1						
	COC	100	SL	1 % v/v	PO1						
	Ammonium Sulfate	100	SG	3.4 lb ai/a	PO1						
8	Karmex	80	DF	4 lb ai/a	PRE	1.0	8.7	10.0	5.3	10.0	4.7
	2,4-D (Weedar 64)	3.8	L	0.95 lb ai/a	PO1						
9	Karmex	80	DF	4 lb ai/a	PRE	1.0	10.0	10.0	7.7	10.0	4.0
	GF3335	3.8	L	0.95 lb ai/a	PO1						
10	Karmex	80	DF	4 lb ai/a	PRE	1.0	8.0	10.0	4.0	7.3	1.7
	GF3335	3.8	L	0.95 lb ai/a	PO1						
	Gramoxone SL	2	SL	0.75 lb ai/a	PO1						
11	Karmex	80	DF	4 lb ai/a	PRE	1.0	10.0	10.0	7.3	10.0	5.0
	Starane Ultra	2.8	L	0.49 lb ai/a	PO1						
	Treevix	70	WG	0.044 lb ai/a	PO1						
	Venue	.177	SC	0.0055 lb ai/a	PO1						
	COC	100	SL	1 % v/v	PO1						
	Ammonium Sulfate	100	SG	3.4 lb ai/a	PO1						
12	Untreated					1.0	8.7	7.0	1.7	6.3	1.0
	LSD P=.05					0.00	3.64	4.32	4.85	4.92	5.26
	Standard Deviation					0.00	2.15	2.55	2.87	2.91	3.11
	CV					0.0	23.97	28.1	43.71	35.23	66.6

Weed Control in Apple - HTRC - 2018

Pest Code	APPLE					
Crop Code	YEFT	ALFA	BFTF	COMA	CORW	
Rating Date	26Jun18	26Jun18	26Jun18	26Jun18	26Jun18	
Rating Type	RATING	RATING	RATING	RATING	RATING	
Rating Unit	1-10	1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage	
1	Karmex	80	DF	4 lb ai/a	PRE	1.0 9.3 7.0 9.7 10.0 9.0
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE	
2	Alion 200	1.67	SC	0.065 lb ai/a	PRE	1.0 10.0 4.3 9.3 7.0 10.0
	Rely 280	2.34	L	1.17 lb ai/a	PRE	
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE	
	Ammonium Sulfate	100	SG	3.4 lb ai/a	PRE	
3	Matrix	25	DF	0.063 lb ai/a	PRE	1.0 8.3 6.7 7.0 10.0 8.7
	Alion 200	1.67	SC	0.065 lb ai/a	PRE	
	COC	100	SL	1 % v/v	PRE	
4	Matrix	25	DF	0.063 lb ai/a	PRE	1.0 8.0 9.0 9.0 10.0 9.0
	Alion 200	1.67	SC	0.065 lb ai/a	PRE	
	Rely 280	2.34	L	0.88 lb ai/a	PRE	
	NIS	100	SL	0.25 % v/v	PRE	
5	Matrix	25	DF	0.063 lb ai/a	PRE	1.0 6.3 7.7 9.0 6.3 9.0
	Alion 200	1.67	SC	0.065 lb ai/a	PRE	
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE	
6	Zeus Prime XC	3.5	EC	0.164 lb ai/a	PRE	1.0 2.7 4.7 10.0 10.0 6.7
	Matrix	25	DF	0.063 lb ai/a	PRE	
	Rely 280	2.34	L	0.88 lb ai/a	PRE	
7	Karmex	80	DF	4 lb ai/a	PRE	1.0 10.0 8.7 9.7 7.0 10.0
	Quinstar	3.8	L	0.37 lb ai/a	PO1	
	COC	100	SL	1 % v/v	PO1	
	Ammonium Sulfate	100	SG	3.4 lb ai/a	PO1	
8	Karmex	80	DF	4 lb ai/a	PRE	1.0 10.0 8.3 9.0 10.0 10.0
	2,4-D (Weedar 64)	3.8	L	0.95 lb ai/a	PO1	
9	Karmex	80	DF	4 lb ai/a	PRE	1.0 9.7 10.0 10.0 10.0 10.0
	GF3335	3.8	L	0.95 lb ai/a	PO1	
10	Karmex	80	DF	4 lb ai/a	PRE	1.0 9.0 4.0 4.7 10.0 9.7
	GF3335	3.8	L	0.95 lb ai/a	PO1	
	Gramoxone SL	2	SL	0.75 lb ai/a	PO1	
11	Karmex	80	DF	4 lb ai/a	PRE	1.0 10.0 10.0 10.0 10.0 10.0
	Starane Ultra	2.8	L	0.49 lb ai/a	PO1	
	Treevix	70	WG	0.044 lb ai/a	PO1	
	Venue	.177	SC	0.0055 lb ai/a	PO1	
	COC	100	SL	1 % v/v	PO1	
	Ammonium Sulfate	100	SG	3.4 lb ai/a	PO1	
12	Untreated					1.0 1.7 3.7 4.7 7.0 4.0
LSD	P=.05					0.00 2.59 5.95 4.15 4.83 3.70
Standard Deviation						0.00 1.53 3.51 2.45 2.85 2.18
CV						0.0 19.33 50.19 28.84 31.89 24.71

Weed Control in Apple - HTRC - 2018

Pest Code					DAND	PRKW	WICA	APPLE	YEFT	ALFA	
Crop Code					26Jun18	26Jun18	26Jun18	18Jul18	18Jul18	18Jul18	
Rating Date					RATING	RATING	RATING	RATING	RATING	RATING	
Rating Type					1-10	1-10	1-10	1-10	1-10	1-10	
Rating Unit											
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage						
1	Karmex	80	DF	4 lb ai/a	PRE	7.0	10.0	4.3	1.0	8.7	6.7
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
2	Alion 200	1.67	SC	0.065 lb ai/a	PRE	9.0	6.3	5.3	1.3	10.0	4.0
	Rely 280	2.34	L	1.17 lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
	Ammonium Sulfate	100	SG	3.4 lb ai/a	PRE						
3	Matrix	25	DF	0.063 lb ai/a	PRE	8.0	7.7	5.3	1.0	6.7	7.0
	Alion 200	1.67	SC	0.065 lb ai/a	PRE						
	COC	100	SL	1 % v/v	PRE						
4	Matrix	25	DF	0.063 lb ai/a	PRE	8.0	8.7	6.7	1.0	6.0	9.0
	Alion 200	1.67	SC	0.065 lb ai/a	PRE						
	Rely 280	2.34	L	0.88 lb ai/a	PRE						
	NIS	100	SL	0.25 % v/v	PRE						
5	Matrix	25	DF	0.063 lb ai/a	PRE	8.7	10.0	8.3	1.0	9.0	8.3
	Alion 200	1.67	SC	0.065 lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
6	Zeus Prime XC	3.5	EC	0.164 lb ai/a	PRE	8.3	8.3	2.7	1.0	1.0	7.7
	Matrix	25	DF	0.063 lb ai/a	PRE						
	Rely 280	2.34	L	0.88 lb ai/a	PRE						
7	Karmex	80	DF	4 lb ai/a	PRE	8.7	10.0	4.7	1.0	9.7	7.3
	Quinstar	3.8	L	0.37 lb ai/a	PO1						
	COC	100	SL	1 % v/v	PO1						
	Ammonium Sulfate	100	SG	3.4 lb ai/a	PO1						
8	Karmex	80	DF	4 lb ai/a	PRE	8.3	10.0	6.3	1.0	8.7	7.7
	2,4-D (Weedar 64)	3.8	L	0.95 lb ai/a	PO1						
9	Karmex	80	DF	4 lb ai/a	PRE	8.7	10.0	7.0	1.0	7.0	9.7
	GF3335	3.8	L	0.95 lb ai/a	PO1						
10	Karmex	80	DF	4 lb ai/a	PRE	6.7	10.0	3.3	1.0	9.3	9.7
	GF3335	3.8	L	0.95 lb ai/a	PO1						
	Gramoxone SL	2	SL	0.75 lb ai/a	PO1						
11	Karmex	80	DF	4 lb ai/a	PRE	9.7	10.0	7.3	1.0	8.7	10.0
	Starane Ultra	2.8	L	0.49 lb ai/a	PO1						
	Treevix	70	WG	0.044 lb ai/a	PO1						
	Venue	.177	SC	0.0055 lb ai/a	PO1						
	COC	100	SL	1 % v/v	PO1						
	Ammonium Sulfate	100	SG	3.4 lb ai/a	PO1						
12	Untreated					1.0	4.7	6.0	1.0	1.0	4.7
	LSD P=.05					3.54	3.81	5.83	0.28	4.02	5.27
	Standard Deviation					2.09	2.25	3.44	0.17	2.37	3.11
	CV					27.25	25.58	61.38	16.22	33.25	40.73

Weed Control in Apple - HTRC - 2018

Pest Code	BFTF					DAND	CORW	HOWE	WICA	APPLE	
Crop Code	18Jul18					18Jul18	18Jul18	18Jul18	18Jul18	27Aug18	
Rating Date	RATING					RATING	RATING	RATING	RATING	RATING	
Rating Type	1-10					1-10	1-10	1-10	1-10	1-10	
Rating Unit											
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage						
1	Karmex	80	DF	4 lb ai/a	PRE	8.3	8.3	8.3	10.0	4.7	1.0
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
2	Alion 200	1.67	SC	0.065 lb ai/a	PRE	10.0	7.3	10.0	6.0	3.0	1.0
	Rely 280	2.34	L	1.17 lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
	Ammonium Sulfate	100	SG	3.4 lb ai/a	PRE						
3	Matrix	25	DF	0.063 lb ai/a	PRE	7.0	6.7	8.7	7.0	5.3	1.0
	Alion 200	1.67	SC	0.065 lb ai/a	PRE						
	COC	100	SL	1 % v/v	PRE						
4	Matrix	25	DF	0.063 lb ai/a	PRE	10.0	6.3	7.7	9.0	5.7	1.0
	Alion 200	1.67	SC	0.065 lb ai/a	PRE						
	Rely 280	2.34	L	0.88 lb ai/a	PRE						
	NIS	100	SL	0.25 % v/v	PRE						
5	Matrix	25	DF	0.063 lb ai/a	PRE	10.0	9.7	9.0	9.0	7.0	1.0
	Alion 200	1.67	SC	0.065 lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
6	Zeus Prime XC	3.5	EC	0.164 lb ai/a	PRE	10.0	8.3	7.0	9.3	3.0	1.0
	Matrix	25	DF	0.063 lb ai/a	PRE						
	Rely 280	2.34	L	0.88 lb ai/a	PRE						
7	Karmex	80	DF	4 lb ai/a	PRE	5.3	9.0	10.0	10.0	5.3	1.0
	Quinstar	3.8	L	0.37 lb ai/a	PO1						
	COC	100	SL	1 % v/v	PO1						
	Ammonium Sulfate	100	SG	3.4 lb ai/a	PO1						
8	Karmex	80	DF	4 lb ai/a	PRE	7.0	7.3	10.0	10.0	7.3	1.0
	2,4-D (Weedar 64)	3.8	L	0.95 lb ai/a	PO1						
9	Karmex	80	DF	4 lb ai/a	PRE	8.7	9.3	10.0	9.0	5.7	1.0
	GF3335	3.8	L	0.95 lb ai/a	PO1						
10	Karmex	80	DF	4 lb ai/a	PRE	8.7	9.0	10.0	10.0	8.3	1.0
	GF3335	3.8	L	0.95 lb ai/a	PO1						
	Gramoxone SL	2	SL	0.75 lb ai/a	PO1						
11	Karmex	80	DF	4 lb ai/a	PRE	10.0	9.7	10.0	10.0	6.3	1.0
	Starane Ultra	2.8	L	0.49 lb ai/a	PO1						
	Treevix	70	WG	0.044 lb ai/a	PO1						
	Venue	.177	SC	0.0055 lb ai/a	PO1						
	COC	100	SL	1 % v/v	PO1						
	Ammonium Sulfate	100	SG	3.4 lb ai/a	PO1						
12	Untreated					8.0	1.7	1.0	1.0	3.7	1.0
	LSD P=.05					3.90	4.08	3.18	2.80	5.42	0.00
	Standard Deviation					2.30	2.41	1.88	1.65	3.20	0.00
	CV					26.81	31.23	22.17	19.74	58.84	0.0

Weed Control in Apple - HTRC - 2018

Pest Code					YEFT	ALFA	BHPL	COMA	PRKW	WIBW	WICA	
Crop Code					27Aug18	27Aug18	27Aug18	27Aug18	27Aug18	27Aug18	27Aug18	
Rating Date					RATING	RATING	RATING	RATING	RATING	RATING	RATING	
Rating Type					1-10	1-10	1-10	1-10	1-10	1-10	1-10	
Rating Unit												
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage							
1	Karmex	80	DF	4 lb ai/a	PRE	8.3	7.0	7.0	10.0	7.7	10.0	4.3
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE							
2	Alion 200	1.67	SC	0.065 lb ai/a	PRE	8.0	7.3	9.3	4.0	3.3	1.3	2.3
	Rely 280	2.34	L	1.17 lb ai/a	PRE							
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE							
	Ammonium Sulfate	100	SG	3.4 lb ai/a	PRE							
3	Matrix	25	DF	0.063 lb ai/a	PRE	6.7	8.0	10.0	10.0	4.7	9.0	3.3
	Alion 200	1.67	SC	0.065 lb ai/a	PRE							
	COC	100	SL	1 % v/v	PRE							
4	Matrix	25	DF	0.063 lb ai/a	PRE	3.7	9.3	10.0	10.0	4.0	10.0	6.3
	Alion 200	1.67	SC	0.065 lb ai/a	PRE							
	Rely 280	2.34	L	0.88 lb ai/a	PRE							
	NIS	100	SL	0.25 % v/v	PRE							
5	Matrix	25	DF	0.063 lb ai/a	PRE	7.0	7.7	10.0	4.0	4.7	10.0	7.3
	Alion 200	1.67	SC	0.065 lb ai/a	PRE							
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE							
6	Zeus Prime XC	3.5	EC	0.164 lb ai/a	PRE	1.0	10.0	10.0	10.0	10.0	10.0	3.3
	Matrix	25	DF	0.063 lb ai/a	PRE							
	Rely 280	2.34	L	0.88 lb ai/a	PRE							
7	Karmex	80	DF	4 lb ai/a	PRE	7.3	7.0	4.3	7.0	10.0	8.3	7.3
	Quinstar	3.8	L	0.37 lb ai/a	PO1							
	COC	100	SL	1 % v/v	PO1							
	Ammonium Sulfate	100	SG	3.4 lb ai/a	PO1							
8	Karmex	80	DF	4 lb ai/a	PRE	7.0	9.3	9.7	10.0	10.0	10.0	5.0
	2,4-D (Weedar 64)	3.8	L	0.95 lb ai/a	PO1							
9	Karmex	80	DF	4 lb ai/a	PRE	4.3	9.0	5.7	10.0	10.0	10.0	5.3
	GF3335	3.8	L	0.95 lb ai/a	PO1							
10	Karmex	80	DF	4 lb ai/a	PRE	6.7	7.7	7.0	10.0	10.0	10.0	7.3
	GF3335	3.8	L	0.95 lb ai/a	PO1							
	Gramoxone SL	2	SL	0.75 lb ai/a	PO1							
11	Karmex	80	DF	4 lb ai/a	PRE	6.0	10.0	10.0	10.0	10.0	10.0	8.0
	Starane Ultra	2.8	L	0.49 lb ai/a	PO1							
	Treevix	70	WG	0.044 lb ai/a	PO1							
	Venue	.177	SC	0.0055 lb ai/a	PO1							
	COC	100	SL	1 % v/v	PO1							
	Ammonium Sulfate	100	SG	3.4 lb ai/a	PO1							
12	Untreated					1.0	7.7	9.0	4.7	4.0	10.0	4.7
	LSD P=.05					5.27	5.01	3.83	5.16	5.00	1.38	4.96
	Standard Deviation					3.11	2.96	2.26	3.04	2.95	0.81	2.93
	CV					55.71	35.53	26.62	36.66	40.13	9.0	54.38

Weed Control in Blueberry - SWMREC - 2018

Project Code: 127-18-1

Location: Benton Harbor, MI

Personnel: Bernard H. Zandstra, Nicole Soldan
 Crop: Blueberry Variety: Bluecrop
 Planting Method: Transplant Planting Date: 1990
 Spacing: 4 ft in row Row Spacing: 10 ft
 Tillage Type: Conventional Study Design: RCB Replications: 3
 Plot Size: 6 ft wide x 30 ft long

Soil Type: Spinks loamy fine sand OM: 2.6% pH: 4.6
 Sand: 80% Silt: 10% Clay: 10% CEC: 9.9

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	4/26	2:00 PM	62/54	F	Moist	7-8 NW	28	30% Cloudy	N
PO1	6/14	1:00 PM	75/65	F	Moist	1-2 NW	47	0% Cloudy	N

Crop and Weed Information at Application

Date	Crop/Weed	Height or Diameter	Growth Stage	Density
4/26	Blueberry	4'	Bud (Leaf)	Good
4/26	QUGR = Quackgrass	4-5"	Veg	Many
4/26	BHPL = Buckhorn Plantain	1-2"	Veg	Few
4/26	DAND = Dandelion	1-3"	Veg	Moderate-Few
4/26	HAVE = Hairy Vetch	3-4"	Veg	Moderate
4/26	MECR = Mouseear Cress	2-3"	Flower	Moderate
4/26	PUDN = Purple Deadnettle	1-2"	Flower	Moderate
4/26	WHCL = White Clover	0-2"	Veg	Moderate
6/14	Blueberry	4-5'	Fruit set	Good
6/14	DOBG = Downy Bromegrass	12-18"	Flower	Moderate
6/14	QUGR = Quackgrass	8"	Veg	Many
6/14	BHPL = Buckhorn Plantain	4-12"	Flower	Many
6/14	DAND = Dandelion	4"	Veg	Moderate-Few
6/14	GORO = Goldenrod	6-10"	Veg	Few-Moderate
6/14	HAVE = Hairy vetch	24"	Flower	Moderate
6/14	RESO = Red Sorrel	8"	Seed	Moderate
6/14	WHCL = White Clover	2-5"	Flower	Many
6/14	WLDGRP = Wild Grape	12"	Veg	Few
6/14	YEHW = Yellow Hawkweed	12"	Flower	Moderate
	BYGR = Barnyardgrass			
	LACG = Large Crabgrass			
	CORW = Common Ragweed			
	HONE = Horsenettle			
	HOWE = Horseweed			

Notes and Comments

1. Spray applied with 2 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
3. Select Max 0.12 lb ai/a was applied to all PO1 treatments.

Weed Control in Blueberry - SWMREC - 2018

Michigan State University

Weed Control in Blueberry - SWMREC - 2018

Trial ID: 127-18-1
Protocol ID: 127-18-1

Location: Benton Harbor, MI
Investigator: Dr. Bernard Zandstra

Trial Year: 2018

Pest Code					DOBG	QUGR	BHPL	CORW	HAVE		
Crop Code					BLBE						
Rating Date					14Jun18	14Jun18	14Jun18	14Jun18	14Jun18		
Rating Type					RATING	RATING	RATING	RATING	RATING		
Rating Unit					1-10	1-10	1-10	1-10	1-10		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Unit	Stage					
1	Zeus Prime XC	3.5	EC	0.22 lb ai/a	PRE	1.3	7.0	9.0	9.3	8.0	5.3
	Surflan	4	L	4 lb ai/a	PRE						
	Karmex	80	DF	0.93 lb ai/a	PRE						
	Gramoxone SL	2	SL	0.6 lb ai/a	PRE						
2	Zeus Prime XC	3.5	EC	0.22 lb ai/a	PRE	1.3	9.0	9.0	10.0	10.0	7.7
	Surflan	4	L	4 lb ai/a	PRE						
	Sinbar	80	WDG	1 lb ai/a	PRE						
	Gramoxone SL	2	SL	0.6 lb ai/a	PRE						
3	Zeus Prime XC	3.5	EC	0.22 lb ai/a	PRE	1.0	6.0	9.0	9.0	10.0	2.0
	Surflan	4	L	4 lb ai/a	PRE						
	Callisto	4	SC	0.188 lb ai/a	PRE						
	Gramoxone SL	2	SL	0.6 lb ai/a	PRE						
4	Zeus Prime XC	3.5	EC	0.22 lb ai/a	PRE	2.3	8.0	9.3	5.3	10.0	7.7
	Matrix	25	DF	0.063 lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
5	Alion 200	1.67	SC	0.065 lb ai/a	PRE	1.3	6.3	9.3	10.0	10.0	4.7
	Rely 280	2.34	L	1.17 lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
6	Chateau SW	51	WDG	0.383 lb ai/a	PRE	1.0	6.7	8.3	9.3	10.0	8.0
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
7	Sinbar	80	WDG	1.2 lb ai/a	PRE	1.3	8.3	9.3	10.0	10.0	10.0
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
	Quinstar	3.8	L	0.375 lb ai/a	PO1						
	COC	100	SL	1 % v/v	PO1						
8	Karmex	80	DF	3 lb ai/a	PRE	1.3	9.0	10.0	10.0	10.0	7.0
	Prowl H2O	3.8	CS	4 lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
	Quinstar	3.8	L	0.375 lb ai/a	PO1						
	COC	100	SL	1 % v/v	PO1						
9	Matrix	25	DF	0.063 lb ai/a	PRE	1.0	9.3	9.7	9.3	10.0	1.7
	Callisto	4	SC	0.188 lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
10	Casoron 170 CS	1.4	CS	2 lb ai/a	PRE	1.0	6.0	9.7	9.7	10.0	1.7
11	Untreated					1.3	4.3	7.7	8.3	10.0	7.0
	LSD P=.05					0.89	3.96	2.11	1.88	1.78	5.70
	Standard Deviation					0.53	2.32	1.24	1.11	1.04	3.35
	CV					40.3	31.93	13.56	12.13	10.64	58.78

Weed Control in Blueberry - SWMREC - 2018

Pest Code					RESO	YEHW		BYGR	LACG	QUGR	
Crop Code							BLBE				
Rating Date					14Jun18	14Jun18	17Jul18	17Jul18	17Jul18	17Jul18	
Rating Type					RATING	RATING	RATING	RATING	RATING	RATING	
Rating Unit					1-10	1-10	1-10	1-10	1-10	1-10	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage						
1	Zeus Prime XC	3.5	EC	0.22 lb ai/a	PRE	8.7	6.7	1.3	5.3	8.7	7.7
	Surflan	4	L	4 lb ai/a	PRE						
	Karmex	80	DF	0.93 lb ai/a	PRE						
	Gramoxone SL	2	SL	0.6 lb ai/a	PRE						
2	Zeus Prime XC	3.5	EC	0.22 lb ai/a	PRE	6.7	5.3	1.0	10.0	9.7	8.7
	Surflan	4	L	4 lb ai/a	PRE						
	Sinbar	80	WDG	1 lb ai/a	PRE						
	Gramoxone SL	2	SL	0.6 lb ai/a	PRE						
3	Zeus Prime XC	3.5	EC	0.22 lb ai/a	PRE	6.0	6.7	1.7	5.7	9.0	6.0
	Surflan	4	L	4 lb ai/a	PRE						
	Callisto	4	SC	0.188 lb ai/a	PRE						
	Gramoxone SL	2	SL	0.6 lb ai/a	PRE						
4	Zeus Prime XC	3.5	EC	0.22 lb ai/a	PRE	8.3	7.3	1.7	6.0	2.3	9.3
	Matrix	25	DF	0.063 lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
5	Alion 200	1.67	SC	0.065 lb ai/a	PRE	6.3	7.3	1.0	4.3	7.0	9.0
	Rely 280	2.34	L	1.17 lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
6	Chateau SW	51	WDG	0.383 lb ai/a	PRE	9.0	7.7	1.0	5.0	9.7	8.3
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
7	Sinbar	80	WDG	1.2 lb ai/a	PRE	8.7	6.7	1.0	10.0	10.0	9.0
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
	Quinstar	3.8	L	0.375 lb ai/a	PO1						
	COC	100	SL	1 % v/v	PO1						
8	Karmex	80	DF	3 lb ai/a	PRE	6.7	8.7	1.0	10.0	10.0	9.7
	Prowl H20	3.8	CS	4 lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
	Quinstar	3.8	L	0.375 lb ai/a	PO1						
	COC	100	SL	1 % v/v	PO1						
9	Matrix	25	DF	0.063 lb ai/a	PRE	7.0	8.0	1.3	4.3	1.3	9.3
	Callisto	4	SC	0.188 lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
10	Casoron 170 CS	1.4	CS	2 lb ai/a	PRE	7.0	8.3	1.0	3.3	2.7	7.0
11	Untreated					1.0	3.0	1.0	8.7	2.0	8.0
	LSD P=.05					5.38	3.07	0.53	5.70	2.47	3.34
	Standard Deviation					3.16	1.80	0.31	3.35	1.45	1.96
	CV					46.15	26.18	26.35	50.67	22.07	23.42

Weed Control in Blueberry - SWMREC - 2018

Pest Code					CORW	HOWE	RESO	YEHW		LACG		
Crop Code									BLBE			
Rating Date					17Jul18	17Jul18	17Jul18	17Jul18	13Aug18	13Aug18		
Rating Type					RATING	RATING	RATING	RATING	RATING	RATING		
Rating Unit					1-10	1-10	1-10	1-10	1-10	1-10		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Unit	Stage						
1	Zeus Prime XC	3.5 EC		0.22 lb ai/a	PRE		7.0	4.3	10.0	1.0	1.7	6.7
	Surflan	4 L		4 lb ai/a	PRE							
	Karmex	80 DF		0.93 lb ai/a	PRE							
	Gramoxone SL	2 SL		0.6 lb ai/a	PRE							
2	Zeus Prime XC	3.5 EC		0.22 lb ai/a	PRE		10.0	7.7	5.7	1.7	1.0	6.0
	Surflan	4 L		4 lb ai/a	PRE							
	Sinbar	80 WDG		1 lb ai/a	PRE							
	Gramoxone SL	2 SL		0.6 lb ai/a	PRE							
3	Zeus Prime XC	3.5 EC		0.22 lb ai/a	PRE		10.0	8.0	8.3	3.7	2.3	5.0
	Surflan	4 L		4 lb ai/a	PRE							
	Callisto	4 SC		0.188 lb ai/a	PRE							
	Gramoxone SL	2 SL		0.6 lb ai/a	PRE							
4	Zeus Prime XC	3.5 EC		0.22 lb ai/a	PRE		10.0	10.0	7.7	3.3	2.0	1.7
	Matrix	25 DF		0.063 lb ai/a	PRE							
	Roundup PowerMax	5.5 L		1 lb ai/a	PRE							
5	Alion 200	1.67 SC		0.065 lb ai/a	PRE		10.0	8.3	6.7	4.7	1.3	4.0
	Rely 280	2.34 L		1.17 lb ai/a	PRE							
	Roundup PowerMax	5.5 L		1 lb ai/a	PRE							
6	Chateau SW	51 WDG		0.383 lb ai/a	PRE		10.0	9.0	8.3	4.7	1.0	3.7
	Roundup PowerMax	5.5 L		1 lb ai/a	PRE							
7	Sinbar	80 WDG		1.2 lb ai/a	PRE		10.0	10.0	6.0	8.0	1.0	8.3
	Roundup PowerMax	5.5 L		1 lb ai/a	PRE							
	Quinstar	3.8 L		0.375 lb ai/a	PO1							
	COC	100 SL		1 % v/v	PO1							
8	Karmex	80 DF		3 lb ai/a	PRE		10.0	10.0	7.3	10.0	1.0	8.7
	Prowl H20	3.8 CS		4 lb ai/a	PRE							
	Roundup PowerMax	5.5 L		1 lb ai/a	PRE							
	Quinstar	3.8 L		0.375 lb ai/a	PO1							
	COC	100 SL		1 % v/v	PO1							
9	Matrix	25 DF		0.063 lb ai/a	PRE		10.0	10.0	6.7	5.0	1.3	1.0
	Callisto	4 SC		0.188 lb ai/a	PRE							
	Roundup PowerMax	5.5 L		1 lb ai/a	PRE							
10	Casoron 170 CS	1.4 CS		2 lb ai/a	PRE		10.0	9.0	8.0	5.0	1.3	1.0
11	Untreated						7.3	7.0	1.0	1.7	1.0	6.7
	LSD P=.05						3.39	4.58	3.76	3.38	0.94	3.53
	Standard Deviation						1.99	2.69	2.21	1.98	0.55	2.08
	CV						20.97	31.66	32.1	44.83	40.37	43.34

Weed Control in Blueberry - SWMREC - 2018

Pest Code					QUGR	CORW	HONE	HOWE	RESO	YEHW	
Crop Code											
Rating Date					13Aug18	13Aug18	13Aug18	13Aug18	13Aug18	13Aug18	
Rating Type					RATING	RATING	RATING	RATING	RATING	RATING	
Rating Unit					1-10	1-10	1-10	1-10	1-10	1-10	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage						
1	Zeus Prime XC	3.5	EC	0.22 lb ai/a	PRE	8.0	7.0	7.0	1.7	9.7	10.0
	Surflan	4	L	4 lb ai/a	PRE						
	Karmex	80	DF	0.93 lb ai/a	PRE						
	Gramoxone SL	2	SL	0.6 lb ai/a	PRE						
2	Zeus Prime XC	3.5	EC	0.22 lb ai/a	PRE	8.3	10.0	7.0	7.0	7.0	9.3
	Surflan	4	L	4 lb ai/a	PRE						
	Sinbar	80	WDG	1 lb ai/a	PRE						
	Gramoxone SL	2	SL	0.6 lb ai/a	PRE						
3	Zeus Prime XC	3.5	EC	0.22 lb ai/a	PRE	7.7	9.0	8.7	4.3	7.7	9.0
	Surflan	4	L	4 lb ai/a	PRE						
	Callisto	4	SC	0.188 lb ai/a	PRE						
	Gramoxone SL	2	SL	0.6 lb ai/a	PRE						
4	Zeus Prime XC	3.5	EC	0.22 lb ai/a	PRE	6.7	10.0	9.0	6.0	9.3	9.0
	Matrix	25	DF	0.063 lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
5	Alion 200	1.67	SC	0.065 lb ai/a	PRE	9.0	10.0	10.0	4.7	5.3	8.3
	Rely 280	2.34	L	1.17 lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
6	Chateau SW	51	WDG	0.383 lb ai/a	PRE	8.3	10.0	7.0	6.3	6.3	8.7
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
7	Sinbar	80	WDG	1.2 lb ai/a	PRE	8.3	10.0	10.0	10.0	6.0	7.7
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
	Quinstar	3.8	L	0.375 lb ai/a	PO1						
	COC	100	SL	1 % v/v	PO1						
8	Karmex	80	DF	3 lb ai/a	PRE	9.3	10.0	10.0	10.0	3.3	10.0
	Prowl H20	3.8	CS	4 lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
	Quinstar	3.8	L	0.375 lb ai/a	PO1						
	COC	100	SL	1 % v/v	PO1						
9	Matrix	25	DF	0.063 lb ai/a	PRE	8.0	10.0	10.0	9.0	7.7	8.0
	Callisto	4	SC	0.188 lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
10	Casoron 170 CS	1.4	CS	2 lb ai/a	PRE	8.3	10.0	10.0	4.0	7.0	10.0
11	Untreated					8.3	7.0	7.7	4.7	1.0	6.0
	LSD P=.05					1.94	3.56	5.05	4.94	5.54	2.66
	Standard Deviation					1.14	2.09	2.96	2.90	3.25	1.56
	CV					13.84	22.31	33.84	47.17	50.88	17.87

Postemergence Weed Control in Cherry - HTRC - 2018

1Project Code: 128-18-3

Location: East Lansing, MI
Block 157-158

Personnel: Bernard H. Zandstra, Nicole Soldan
 Crop: Cherry, Tart Variety: Montmorency
 Planting Method: Transplant Planting Date: 2007
 Spacing: 15 ft Row Spacing: 20 ft
 Tillage Type: Conventional Study Design: RCB
 Plot Size: 11 ft wide x 50 ft long

Replications: 3

Soil Type: Marlette Fine Sandy Loam OM: 3.3% pH: 6.3
 Sand: 45% Silt: 30% Clay: 25% CEC: 6.9

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	4/13	1:30 PM	58/50	F	Damp	4-6 NE	48	100% Cloudy	N
PO1	6/8	2:30 PM	81/69	F	Dry	1-5 E	45	70% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/13	Cherry	10-15'	Pre-bud	Good
4/13	ANBG = Annual Bluegrass	1-2"	Veg	Few
4/13	ORGR = Orchardgrass	2-3"	Veg	Few
4/13	QUGR = Quackgrass	2-4"	Veg	Few
4/13	COCW = Common Chickweed	0.5-1"	Some Flower	Moderate
4/13	COMA = Common Mallow	1-3"	Veg	Few
4/13	DAND = Dandelion	3-4"	Few Flowers	Moderate
6/8	Cherry	10-15'	Fruit Set	Good
6/8	BEGR = Bermudagrass	8"	Veg	Many
6/8	ORGR = Orchardgrass	12"	Veg	Moderate
6/8	QUGR = Quackgrass	10"	Veg	Moderate
6/8	COMW = Common Milkweed	1-3'	Flower	Moderate
6/8	DAND = Dandelion	8-12"	Veg	Many
6/8	GORO = Goldenrod	12"	Veg	Few
6/8	HONE = Horsenettle	5"	Seed Set	Few
6/8	PEST = Perennial Sowthistle	12"	Veg	Few
6/8	POIV = Poison Ivy	6-12"	Veg	Many
6/8	WHCL = White Clover	1-2"	Veg	Moderate
6/8	WIBW = Wild Buckwheat	3"	Veg	Few
6/8	WICA = Wild Carrot	12"	Veg	Moderate
6/8	WLDGRP = Wild Grape	6-12"	Veg	Many
6/8	VICR = Virginia Creeper	5"	Veg	Moderate
	ALFA = Alfalfa			

Notes and Comments

1. Spray applied with 4 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer. One pass on each side of row.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
3. PRE = Early April
4. PO1 = Early June after fruit set
5. GF3335 is choline salt of 2,4-D

Postemergence Weed Control in Cherry - HTRC - 2018

Michigan State University

Postemergence Weed Control in Cherry with 2,4-D - HTRC - 2018

Trial ID: 128-18-3
Protocol ID: 128-18-3

Location: East Lansing, MI
Investigator: Dr. Bernard Zandstra

Trial Year: 2018

Pest Code					BEGR	ORGR	QUGR	COMW	DAND		
Crop Name					CHERRY						
Rating Date					31May18	31May18	31May18	31May18	31May18	31May18	
Rating Type					RATING	RATING	RATING	RATING	RATING	RATING	
Rating Unit					1-10	1-10	1-10	1-10	1-10	1-10	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Unit	Stage					
1	Untreated										
2	Alion 200	1.67	SC	0.065 lb ai/a	PRE	1.0	10.0	7.0	7.0	6.3	5.7
	Rely 280	2.34	L	1.17 lb ai/a	PRE	1.0	7.0	10.0	10.0	5.7	9.0
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
	AMS	100	DF	3 lb ai/a	PRE						
3	Princep	90	WDG	3 lb ai/a	PRE	1.0	7.3	3.0	7.7	5.0	3.7
	Quinstar	3.8	L	0.375 lb ai/a	PO1						
	COC	100	SL	1 % v/v	PO1						
4	Princep	90	WDG	3 lb ai/a	PRE	1.0	4.0	6.7	7.7	9.0	3.0
	GF-3335	3.8	L	0.95 lb ai/a	PO1						
5	Princep	90	WDG	3 lb ai/a	PRE	1.0	7.7	5.3	7.3	4.0	3.3
	Weedar 64	3.8	L	0.95 lb ai/a	PO1						
6	Princep	90	WDG	3 lb ai/a	PRE	1.0	1.0	10.0	10.0	5.3	7.0
	GF-3335	3.8	L	0.95 lb ai/a	PO1						
	Durango	5.4	L	1.35 lb ai/a	PO1						
7	Princep	90	WDG	3 lb ai/a	PRE	1.0	6.0	10.0	10.0	3.3	3.0
	Weedar 64	3.8	L	0.95 lb ai/a	PO1						
	Durango	5.4	L	1.35 lb ai/a	PO1						
8	Princep	90	WDG	3 lb ai/a	PRE	1.0	4.0	9.3	10.0	5.0	4.3
	Durango	5.4	L	1.35 lb ai/a	PO1						
	LSD P=.05					0.00	7.72	5.25	4.61	5.98	4.79
	Standard Deviation					0.00	4.41	3.00	2.63	3.41	2.74
	CV					0.0	75.07	39.12	30.21	62.53	56.15

Postemergence Weed Control in Cherry - HTRC - 2018

Pest Code	PEST	POIV	BEGR	ORGR	QUGR						
Crop Name	CHERRY										
Rating Date	31May18	31May18	28Jun18	28Jun18	28Jun18						
Rating Type	RATING	RATING	RATING	RATING	RATING						
Rating Unit	1-10	1-10	1-10	1-10	1-10						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage						
1	Untreated					4.7	2.3	1.0	9.0	6.3	5.7
2	Alion 200	1.67	SC	0.065 lb ai/a	PRE	6.3	6.3	1.0	8.7	9.3	7.7
	Rely 280	2.34	L	1.17 lb ai/a	PRE						
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE						
	AMS	100	DF	3 lb ai/a	PRE						
3	Princep	90	WDG	3 lb ai/a	PRE	6.3	10.0	1.0	5.0	6.7	4.0
	Quinstar	3.8	L	0.375 lb ai/a	PO1						
	COC	100	SL	1 % v/v	PO1						
4	Princep	90	WDG	3 lb ai/a	PRE	7.0	10.0	1.0	4.0	9.7	6.7
	GF-3335	3.8	L	0.95 lb ai/a	PO1						
5	Princep	90	WDG	3 lb ai/a	PRE	5.0	7.0	1.0	7.3	10.0	8.3
	Weedar 64	3.8	L	0.95 lb ai/a	PO1						
6	Princep	90	WDG	3 lb ai/a	PRE	9.3	7.0	1.0	7.0	9.3	8.7
	GF-3335	3.8	L	0.95 lb ai/a	PO1						
	Durango	5.4	L	1.35 lb ai/a	PO1						
7	Princep	90	WDG	3 lb ai/a	PRE	7.0	7.0	1.0	6.7	9.7	9.6
	Weedar 64	3.8	L	0.95 lb ai/a	PO1						
	Durango	5.4	L	1.35 lb ai/a	PO1						
8	Princep	90	WDG	3 lb ai/a	PRE	4.7	4.3	1.0	8.7	9.7	9.0
	Durango	5.4	L	1.35 lb ai/a	PO1						
	LSD P=.05					5.57	7.22	0.00	6.39	3.04	4.41
	Standard Deviation					3.18	4.13	0.00	3.65	1.73	2.50
	CV					50.57	61.12	0.0	51.81	19.63	33.6

Postemergence Weed Control in Cherry - HTRC - 2018

Pest Code					ALFA	COMW	DAND	PEST	POIV	WICA		
Crop Name					28Jun18	28Jun18	28Jun18	28Jun18	28Jun18	28Jun18		
Rating Date					RATING	RATING	RATING	RATING	RATING	RATING		
Rating Type					1-10	1-10	1-10	1-10	1-10	1-10		
Rating Unit												
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Unit	Stage						
1	Untreated						6.7	5.0	5.7	9.0	4.7	6.0
2	Alion 200	1.67	SC	0.065 lb ai/a	PRE		4.3	6.7	8.7	7.0	5.0	8.7
	Rely 280	2.34	L	1.17 lb ai/a	PRE							
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE							
	AMS	100	DF	3 lb ai/a	PRE							
3	Princep	90	WDG	3 lb ai/a	PRE		7.3	6.3	6.7	6.3	9.0	7.0
	Quinstar	3.8	L	0.375 lb ai/a	PO1							
	COC	100	SL	1 % v/v	PO1							
4	Princep	90	WDG	3 lb ai/a	PRE		10.0	9.0	6.0	8.0	10.0	6.0
	GF-3335	3.8	L	0.95 lb ai/a	PO1							
5	Princep	90	WDG	3 lb ai/a	PRE		10.0	4.0	8.0	8.0	10.0	6.7
	Weedar 64	3.8	L	0.95 lb ai/a	PO1							
6	Princep	90	WDG	3 lb ai/a	PRE		8.3	5.3	8.7	10.0	7.0	7.3
	GF-3335	3.8	L	0.95 lb ai/a	PO1							
	Durango	5.4	L	1.35 lb ai/a	PO1							
7	Princep	90	WDG	3 lb ai/a	PRE		10.0	7.3	7.7	8.7	10.0	8.3
	Weedar 64	3.8	L	0.95 lb ai/a	PO1							
	Durango	5.4	L	1.35 lb ai/a	PO1							
8	Princep	90	WDG	3 lb ai/a	PRE		7.0	8.3	7.7	8.0	8.3	8.7
	Durango	5.4	L	1.35 lb ai/a	PO1							
	LSD P=.05						4.30	4.23	2.39	4.96	4.27	3.56
	Standard Deviation						2.46	2.41	1.36	2.83	2.44	2.03
	CV						30.89	37.14	18.48	34.82	30.45	27.7

Postemergence Weed Control in Cherry - HTRC - 2018

Pest Code					WLDGRP	BEGR	ALFA	COMW	PEST			
Crop Name					CHERRY							
Rating Date					28Jun18	18Jul18	18Jul18	18Jul18	18Jul18	18Jul18		
Rating Type					RATING	RATING	RATING	RATING	RATING	RATING		
Rating Unit					1-10	1-10	1-10	1-10	1-10	1-10		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Unit	Stage						
1	Untreated						1.3	1.0	6.7	10.0	7.0	9.7
2	Alion 200	1.67	SC	0.065 lb ai/a	PRE		3.0	1.0	7.0	9.0	5.3	7.0
	Rely 280	2.34	L	1.17 lb ai/a	PRE							
	Roundup PowerMax	5.5	L	1 lb ai/a	PRE							
	AMS	100	DF	3 lb ai/a	PRE							
3	Princep	90	WDG	3 lb ai/a	PRE		5.0	1.0	6.7	9.0	6.7	10.0
	Quinstar	3.8	L	0.375 lb ai/a	PO1							
	COC	100	SL	1 % v/v	PO1							
4	Princep	90	WDG	3 lb ai/a	PRE		7.7	1.0	2.0	10.0	10.0	7.7
	GF-3335	3.8	L	0.95 lb ai/a	PO1							
5	Princep	90	WDG	3 lb ai/a	PRE		8.3	1.0	7.0	10.0	5.3	10.0
	Weedar 64	3.8	L	0.95 lb ai/a	PO1							
6	Princep	90	WDG	3 lb ai/a	PRE		5.7	1.0	5.7	10.0	7.0	10.0
	GF-3335	3.8	L	0.95 lb ai/a	PO1							
	Durango	5.4	L	1.35 lb ai/a	PO1							
7	Princep	90	WDG	3 lb ai/a	PRE		7.7	1.0	5.7	10.0	7.0	10.0
	Weedar 64	3.8	L	0.95 lb ai/a	PO1							
	Durango	5.4	L	1.35 lb ai/a	PO1							
8	Princep	90	WDG	3 lb ai/a	PRE		2.3	1.0	6.7	10.0	7.0	10.0
	Durango	5.4	L	1.35 lb ai/a	PO1							
	LSD P=.05						4.33	0.00	6.83	1.57	5.40	4.21
	Standard Deviation						2.47	0.00	3.90	0.90	3.08	2.40
	CV						48.29	0.0	65.89	9.19	44.55	25.85

Postemergence Weed Control in Cherry - HTRC - 2018

Pest Code					POIV	WICA		BEGR	POIV	WICA	WLDGRP		
Crop Name							CHERRY						
Rating Date					18Jul18	18Jul18	27Aug18	27Aug18	27Aug18	27Aug18	27Aug18		
Rating Type					RATING	RATING	RATING	RATING	RATING	RATING	RATING		
Rating Unit					1-10	1-10	1-10	1-10	1-10	1-10	1-10		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Unit	Growth Stage							
1	Untreated						7.0	8.0	1.0	7.7	4.0	5.0	4.0
2	Alion 200	1.67	SC	0.065	lb ai/a	PRE	4.3	10.0	1.0	7.0	6.0	9.3	3.0
	Rely 280	2.34	L	1.17	lb ai/a	PRE							
	Roundup PowerMax	5.5	L	1	lb ai/a	PRE							
	AMS	100	DF	3	lb ai/a	PRE							
3	Princep	90	WDG	3	lb ai/a	PRE	8.7	10.0	1.0	4.0	7.7	8.0	7.0
	Quinstar	3.8	L	0.375	lb ai/a	PO1							
	COC	100	SL	1	% v/v	PO1							
4	Princep	90	WDG	3	lb ai/a	PRE	10.0	6.0	1.0	4.0	10.0	6.3	6.3
	GF-3335	3.8	L	0.95	lb ai/a	PO1							
5	Princep	90	WDG	3	lb ai/a	PRE	9.3	10.0	1.0	4.0	10.0	7.7	8.3
	Weedar 64	3.8	L	0.95	lb ai/a	PO1							
6	Princep	90	WDG	3	lb ai/a	PRE	7.0	10.0	1.0	2.3	7.0	7.3	3.7
	GF-3335	3.8	L	0.95	lb ai/a	PO1							
	Durango	5.4	L	1.35	lb ai/a	PO1							
7	Princep	90	WDG	3	lb ai/a	PRE	9.3	10.0	1.0	4.7	10.0	8.7	5.7
	Weedar 64	3.8	L	0.95	lb ai/a	PO1							
	Durango	5.4	L	1.35	lb ai/a	PO1							
8	Princep	90	WDG	3	lb ai/a	PRE	10.0	9.3	1.0	5.3	10.0	7.7	3.7
	Durango	5.4	L	1.35	lb ai/a	PO1							
	LSD P=.05						5.26	3.14	0.00	7.92	4.96	5.22	4.93
	Standard Deviation						3.00	1.79	0.00	4.52	2.83	2.98	2.82
	CV						36.56	19.58	0.0	92.78	35.0	39.72	54.06

Postemergence Field Bindweed Control in Concord Grape - HTRC - 2018

Project Code: 132-18-1

Location: East Lansing, MI
Block 37

Personnel: Bernard H. Zandstra, Nicole Soldan
 Crop: Grape Variety: Concord
 Planting Method: Seedling Planting Date: 1967
 Spacing: 7 ft; 4 vines/plot Row Spacing: 10 ft
 Tillage Type: Conventional Study Design: RCB
 Plot Size: 6 ft wide x 30 ft long

Replications: 3

Soil Type: Capac Loam OM: 5.1% pH: 7.1
 Sand: 53% Silt: 30% Clay: 17% CEC: 12.8

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PO1	7/27	8:50 AM	70/67	F	Dry	1-2 NW	72	0% Cloudy	Y

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
7/27	Grape	6'	Fruit	Good
7/27	CATH = Canada Thistle	18-24"	Flower	Moderate
7/27	COMA = Common Mallow	6-8"	Flower	Moderate
7/27	EBNS = Eastern Black Nightshade	10-14"	Flower	Few
7/27	FIBW = Field Bindweed	4-8"	Flower	Many
	REFE = Red Fescue			
	WICA = Wild Carrot			

Notes and Comments

- Spray applied with 2 nozzle shielded boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer. Applied 32 inch band on each side of row.
 - Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
-

Postemergence Field Bindweed Control in Concord Grape - HTRC - 2018

Michigan State University

Postemergence Field Bindweed Control in Concord Grape - HTRC - 2018

Trial ID: 132-18-1 Location: East Lansing, MI Trial Year: 2018
 Protocol ID: 132-18-1 Investigator: Dr. Bernard Zandstra

Pest Code					REFE	CATH	COMA	EBNS	FIBW		
Crop Code	GRAPE										
Rating Date	09Aug18										
Rating Type	RATING										
Rating Unit	1-10										
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage						
1	Roundup Ultra	4 L		1 lb ai/a	PO1	1.0	7.3	7.7	5.7	6.7	4.7
2	Rely 280	2.34 L		1 lb ai/a	PO1	1.7	9.7	9.0	7.0	10.0	8.0
3	Quinstar	3.8 L		0.25 lb ai/a	PO1	1.0	9.7	10.0	4.0	1.7	7.3
4	Embed	3.8 L		1 lb ai/a	PO1	1.3	7.0	9.3	6.3	3.0	9.0
5	Untreated					1.0	6.0	7.0	4.0	1.0	1.0
6	Stinger	3 L		0.125 lb ai/a	PO1	1.0	10.0	10.0	1.0	10.0	1.7
LSD P=.05						0.58	6.07	5.28	7.61	3.48	3.57
Standard Deviation						0.32	3.33	2.90	4.18	1.91	1.96
CV						27.11	40.29	32.88	89.64	35.48	37.2

Pest Code					PEST	WICA		REFE	CATH	COMA	
Crop Code	GRAPE										
Rating Date	09Aug18										
Rating Type	RATING										
Rating Unit	1-10										
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage						
1	Roundup Ultra	4 L		1 lb ai/a	PO1	6.3	9.3	2.0	8.3	10.0	4.0
2	Rely 280	2.34 L		1 lb ai/a	PO1	9.3	10.0	3.0	8.7	10.0	5.3
3	Quinstar	3.8 L		0.25 lb ai/a	PO1	7.0	10.0	1.3	8.3	9.0	1.0
4	Embed	3.8 L		1 lb ai/a	PO1	7.0	8.7	1.3	6.3	10.0	7.3
5	Untreated					7.0	4.0	1.0	8.3	10.0	4.0
6	Stinger	3 L		0.125 lb ai/a	PO1	6.7	6.0	1.0	1.0	10.0	1.0
LSD P=.05						7.68	5.61	0.64	2.40	1.29	7.01
Standard Deviation						4.22	3.08	0.35	1.32	0.71	3.85
CV						58.45	38.53	21.7	19.27	7.19	102.03

Postemergence Field Bindweed Control in Concord Grape - HTRC - 2018

Pest Code			EBNS	FIBW	PEST	WICA	GRAPE		COMA			
Crop Code			17Aug18	17Aug18	17Aug18	17Aug18	29Aug18	29Aug18				
Rating Date			RATING	RATING	RATING	RATING	RATING	RATING				
Rating Type			1-10	1-10	1-10	1-10	1-10	1-10	1-10			
Rating Unit												
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Unit	Stage						
1	Roundup Ultra	4 L		1 lb ai/a	PO1		5.0	2.7	6.0	9.0	1.3	4.0
2	Rely 280	2.34 L		1 lb ai/a	PO1		9.3	4.7	8.3	9.3	1.7	4.0
3	Quinstar	3.8 L		0.25 lb ai/a	PO1		1.0	8.0	8.3	4.3	1.0	3.3
4	Embed	3.8 L		1 lb ai/a	PO1		1.7	9.7	6.7	5.3	1.0	8.0
5	Untreated						1.0	1.0	7.0	4.0	1.0	4.0
6	Stinger	3 L		0.125 lb ai/a	PO1		10.0	1.0	7.3	4.7	1.0	1.0
LSD P=.05							3.50	2.68	6.28	5.48	0.58	4.65
Standard Deviation							1.92	1.47	3.45	3.01	0.32	2.55
CV							41.22	32.71	47.44	49.33	27.11	62.97

Pest Code			EBNS	FIBW	WICA	GRAPE		COMA	EBNS			
Crop Code			29Aug18	29Aug18	29Aug18	14Sep18	14Sep18	14Sep18				
Rating Date			RATING	RATING	RATING	RATING	RATING	RATING				
Rating Type			1-10	1-10	1-10	1-10	1-10	1-10	1-10			
Rating Unit												
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Unit	Stage						
1	Roundup Ultra	4 L		1 lb ai/a	PO1		5.7	5.3	9.3	1.0	4.0	6.3
2	Rely 280	2.34 L		1 lb ai/a	PO1		6.3	3.3	10.0	1.0	2.7	7.0
3	Quinstar	3.8 L		0.25 lb ai/a	PO1		2.0	8.3	10.0	1.0	3.0	6.0
4	Embed	3.8 L		1 lb ai/a	PO1		1.7	7.7	7.0	1.0	10.0	1.7
5	Untreated						3.0	1.0	4.7	1.0	1.0	5.7
6	Stinger	3 L		0.125 lb ai/a	PO1		10.0	1.0	8.7	1.0	1.0	10.0
LSD P=.05							4.83	3.85	3.75	0.00	4.08	6.49
Standard Deviation							2.66	2.12	2.06	0.00	2.24	3.57
CV							55.6	47.67	24.92	0.0	62.06	58.37

Pest Code			FIBW	PEST	WICA							
Crop Code			14Sep18	14Sep18	14Sep18							
Rating Date			RATING	RATING	RATING							
Rating Type			1-10	1-10	1-10							
Rating Unit												
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Unit	Stage						
1	Roundup Ultra	4 L		1 lb ai/a	PO1		3.7	6.3	6.0			
2	Rely 280	2.34 L		1 lb ai/a	PO1		1.7	7.7	8.7			
3	Quinstar	3.8 L		0.25 lb ai/a	PO1		9.0	7.7	7.0			
4	Embed	3.8 L		1 lb ai/a	PO1		9.3	4.3	6.0			
5	Untreated						1.7	7.7	4.3			
6	Stinger	3 L		0.125 lb ai/a	PO1		1.0	7.7	8.0			
LSD P=.05							2.14	6.75	6.58			
Standard Deviation							1.18	3.71	3.62			
CV							26.85	53.84	54.29			

Preemergence Weed Control in Hops - SWMREC - 2018

Project Code: 135-18-1

Location:
Benton Harbor, MI

Personnel: Bernard H. Zandstra, Nicole Soldan

Crop: Hops Variety: Cascade, Centennial, Willamette, Santiam

Planting Method: Transplant Planting Date: 2013, 2016

Spacing: 6 ft Row Spacing: 10 ft

Tillage Type: Conventional Study Design: RCB Replications: 3

Plot Size: 5.5 ft wide x 30 ft long

Soil Type: Spinks loamy fine sand OM: 1.2% pH: 6.5
Sand: 91% Silt: 4% Clay: 5% CEC: 4.3

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	4/26/18	11:45 AM	55/45	F	Moist	1-6 NE	29	5% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/26	Hops	0-3"	Veg	Good
4/26	QUGR = Quackgrass	3-5"	Veg	Many
4/26	BHPL = Buckhorn Plantain	2-3"	Veg	Moderate
4/26	PUDN = Purple Deadnettle	1"	Veg	Moderate
4/26	RESO = Red Sorrel	1"	Veg	Moderate
4/26	BLCA = Bladder Champion	1-4"	Veg	Moderate
4/26	WHCL = White Clover	1-2"	Veg	Moderate
	HOAL = Hoary Alyssum			
	HONE = Horsenettle			
	HOWE = Horseweed			

Notes and Comments

1. Spray applied with 2 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
3. One pass on each side of row. Small shoots were present.

Preemergence Weed Control in Hops - SWMREC - 2018

Michigan State University

Preemergence Weed Control in Hops - SWMREC - 2018

Trial ID: 135-18-1
Protocol ID: 135-18-1

Location: Benton Harbor, MI
Investigator: Dr. Bernard Zandstra

Trial Year: 2018

Pest Code						QUGR	HOAL	HONE	HOWE	RESO			
Crop Code						HOPS						HOPS	
Rating Date						14Jun18	14Jun18	14Jun18	14Jun18	14Jun18	14Jun18	17Jul18	
Rating Type						RATING	RATING	RATING	RATING	RATING	RATING	RATING	
Rating Unit												1-10	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage							
1	Chateau SW	51	WDG	0.191	lb ai/a	PRE	2.7	3.0	6.3	10.0	9.3	7.0	1.7
	Rely 280	2.34	L		1 lb ai/a	PRE							
2	Solicam	80	DF	3	lb ai/a	PRE	3.7	3.3	7.3	10.0	7.0	10.0	2.7
	Rely 280	2.34	L		1 lb ai/a	PRE							
3	Prowl H20	3.8	CS	3.8	lb ai/a	PRE	4.3	1.7	6.0	7.0	7.7	10.0	3.7
	Rely 280	2.34	L		1 lb ai/a	PRE							
4	Alion 200	1.67	SC	0.065	lb ai/a	PRE	1.0	2.7	7.3	9.0	7.0	7.0	1.0
	Rely 280	2.34	L		1 lb ai/a	PRE							
5	Outlook	6	EC	0.98	lb ai/a	PRE	2.0	3.7	4.0	7.0	10.0	4.0	1.3
	Rely 280	2.34	L		1 lb ai/a	PRE							
6	Trellis SC	4.17	SC	1	lb ai/a	PRE	2.0	2.0	10.0	4.0	2.3	10.0	1.3
	Prowl H20	3.8	CS	2	lb ai/a	PRE							
	Rely 280	2.34	L		1 lb ai/a	PRE							
7	GoalTender	4	SC	1	lb ai/a	PRE	2.7	1.3	3.7	10.0	6.0	10.0	2.3
	Select Max	.97	EC	0.12	lb ai/a	PRE							
8	Untreated						2.3	1.7	1.0	7.0	8.0	7.0	1.7
	LSD P=.05						2.18	3.48	5.69	5.08	5.81	5.75	2.07
	Standard Deviation						1.25	1.99	3.25	2.90	3.32	3.28	1.18
	CV						48.25	82.33	56.88	36.25	46.27	40.42	60.39

Preemergence Weed Control in Hops - SWMREC - 2018

Pest Code	QUGR BLCA HOAL HONE HOWE RESO											
Crop Code	HOPS											
Rating Date	17Jul18											13Aug18
Rating Type	RATING											RATING
Rating Unit	1-10											1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Rate Unit	Growth Stage	QUGR	BLCA	HOAL	HONE	HOWE	RESO
1	Chateau SW	51	WDG	0.191	lb ai/a	PRE	3.3	10.0	7.0	7.0	9.3	7.3
	Rely 280	2.34	L		1 lb ai/a	PRE						
2	Solicam	80	DF	3	lb ai/a	PRE	4.0	10.0	9.3	7.0	7.0	9.7
	Rely 280	2.34	L		1 lb ai/a	PRE						
3	Prowl H20	3.8	CS	3.8	lb ai/a	PRE	1.3	9.0	7.0	7.3	7.7	10.0
	Rely 280	2.34	L		1 lb ai/a	PRE						
4	Alion 200	1.67	SC	0.065	lb ai/a	PRE	2.3	7.0	1.7	6.7	2.3	10.0
	Rely 280	2.34	L		1 lb ai/a	PRE						
5	Outlook	6	EC	0.98	lb ai/a	PRE	1.7	10.0	4.0	4.0	7.7	7.3
	Rely 280	2.34	L		1 lb ai/a	PRE						
6	Trellis SC	4.17	SC	1	lb ai/a	PRE	2.0	10.0	9.3	3.0	3.3	10.0
	Prowl H20	3.8	CS	2	lb ai/a	PRE						
	Rely 280	2.34	L		1 lb ai/a	PRE						
7	GoalTender	4	SC	1	lb ai/a	PRE	2.0	7.0	7.0	4.0	4.7	10.0
	Select Max	.97	EC	0.12	lb ai/a	PRE						
8	Untreated						1.7	7.0	1.0	4.0	2.7	7.0
	LSD P=.05						3.53	5.80	5.73	7.05	5.86	4.28
	Standard Deviation						2.01	3.31	3.27	4.02	3.34	2.44
	CV						87.86	37.87	56.45	74.85	59.9	27.42
												65.6

Pest Code	QUGR BLCA HOAL HONE HOWE										
Crop Code											
Rating Date	13Aug18										
Rating Type	RATING										
Rating Unit	1-10										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Rate Unit	Growth Stage	QUGR	BLCA	HOAL	HONE	HOWE
1	Chateau SW	51	WDG	0.191	lb ai/a	PRE	3.3	10.0	10.0	4.3	9.7
	Rely 280	2.34	L		1 lb ai/a	PRE					
2	Solicam	80	DF	3	lb ai/a	PRE	3.3	9.3	9.0	6.3	7.0
	Rely 280	2.34	L		1 lb ai/a	PRE					
3	Prowl H20	3.8	CS	3.8	lb ai/a	PRE	1.0	10.0	10.0	2.0	10.0
	Rely 280	2.34	L		1 lb ai/a	PRE					
4	Alion 200	1.67	SC	0.065	lb ai/a	PRE	2.3	7.3	7.0	1.3	4.0
	Rely 280	2.34	L		1 lb ai/a	PRE					
5	Outlook	6	EC	0.98	lb ai/a	PRE	3.0	7.3	7.7	4.3	8.3
	Rely 280	2.34	L		1 lb ai/a	PRE					
6	Trellis SC	4.17	SC	1	lb ai/a	PRE	1.0	10.0	10.0	1.0	1.3
	Prowl H20	3.8	CS	2	lb ai/a	PRE					
	Rely 280	2.34	L		1 lb ai/a	PRE					
7	GoalTender	4	SC	1	lb ai/a	PRE	3.0	10.0	10.0	5.3	7.0
	Select Max	.97	EC	0.12	lb ai/a	PRE					
8	Untreated						2.0	4.3	2.0	3.7	3.0
	LSD P=.05						2.69	4.78	3.88	5.35	6.06
	Standard Deviation						1.54	2.73	2.21	3.05	3.46
	CV						64.64	31.92	26.96	86.18	55.0

Postemergence Weed Control in Hops - SWMREC - 2018

Project Code: 135-18-2

Location:
Benton Harbor, MI

Personnel: Bernard H. Zandstra, Nicole Soldan
 Crop: Hops Variety: Cascade, Centennial, Willamette, Santiam
 Planting Method: Transplant Planting Date: 2013, 2016
 Spacing: 6 ft Row Spacing: 10 ft
 Tillage Type: Conventional Study Design: RCB Replications: 3
 Plot Size: 5.5 ft wide x 30 ft long

Soil Type: Spinks loamy fine sand OM: 1.2% pH: 6.5
 Sand: 91% Silt: 4% Clay: 5% CEC: 4.3

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PO1	6/14/18	12:20 PM	78/71	F	Moist	0-2	37	20% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
6/14	Hops	6-10'	Vine	Good
6/14	QUGR = Quackgrass	18-24"	Seed bud	Moderate
6/14	BLCA = Bladder Campion	18"	Flower	Many
6/14	HOAL = Hoary Alyssum	12-18"	Flower	Many
6/14	HONE = Horsenettle	6-12"	Veg	Few
6/14	HOWE = Horseweed	6-10"	Veg	Moderate
6/14	RESO = Red Sorrel	2-10"	Flower	Moderate

Notes and Comments

1. Spray applied with 2 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
 2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
 3. Vines should be tied up before POST application.
 4. Apply POST in early June. One pass on each side of row.
-

Postemergence Weed Control in Hops - SWMREC - 2018

Michigan State University

Postemergence Weed Control in Hops - SWMREC - 2018

Trial ID: 135-18-2 Location: Benton Harbor, MI Trial Year: 2018
 Protocol ID: 135-18-2 Investigator: Dr. Bernard Zandstra

					QUGR	BLCA	HOAL	HONE	HOWE		
					HOPS						
					17Jul18	17Jul18	17Jul18	17Jul18	17Jul18	17Jul18	
					RATING	RATING	RATING	RATING	RATING	RATING	
					1-10	1-10	1-10	1-10	1-10	1-10	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Growth Stage						
1	Aim	2	EC	0.032 lb ai/a	PO1	1.3	4.0	7.0	1.0	7.7	6.7
	Select Max	.97	EC	0.12 lb ai/a	PO1						
2	Gramoxone SL	2	SL	1 lb ai/a	PO1	1.3	6.7	9.0	10.0	4.0	7.3
3	Reglone	2	L	1 lb ai/a	PO1	1.0	5.3	7.7	7.3	8.3	8.3
4	Stinger	3	L	0.25 lb ai/a	PO1	1.3	5.7	8.3	4.0	8.0	10.0
	Select Max	.97	EC	0.12 lb ai/a	PO1						
5	Rely 280	2.34	L	1.2 lb ai/a	PO1	2.0	5.3	10.0	2.7	1.3	7.0
6	Roundup Original	4	L	0.5 lb ai/a	PO1	1.7	7.0	10.0	7.0	6.0	10.0
	NIS	100	SL	0.25 % v/v	PO1						
7	Roundup PowerMax	5.5	L	0.5 lb ai/a	PO1	3.0	4.3	9.3	9.0	7.3	10.0
8	Untreated					1.0	8.1	7.3	4.0	7.7	5.7
LSD P=.05						1.35	3.68	5.33	7.01	5.57	5.83
Standard Deviation						0.77	2.09	3.04	4.00	3.18	3.33
CV						48.73	35.96	35.44	71.12	50.57	40.94

					QUGR	BLCA	HOAL	HONE	HOWE		
					HOPS						
					13Aug18	13Aug18	13Aug18	13Aug18	13Aug18	13Aug18	
					RATING	RATING	RATING	RATING	RATING	RATING	
					1-10	1-10	1-10	1-10	1-10	1-10	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Growth Stage						
1	Aim	2	EC	0.032 lb ai/a	PO1	2.3	3.7	7.0	5.0	3.7	7.0
	Select Max	.97	EC	0.12 lb ai/a	PO1						
2	Gramoxone SL	2	SL	1 lb ai/a	PO1	3.7	7.0	10.0	10.0	3.3	7.0
3	Reglone	2	L	1 lb ai/a	PO1	1.3	2.7	4.3	4.7	5.3	9.0
4	Stinger	3	L	0.25 lb ai/a	PO1	2.3	4.7	6.0	7.0	7.3	10.0
	Select Max	.97	EC	0.12 lb ai/a	PO1						
5	Rely 280	2.34	L	1.2 lb ai/a	PO1	2.7	5.0	4.7	7.0	2.0	5.7
6	Roundup Original	4	L	0.5 lb ai/a	PO1	3.3	4.7	7.0	7.7	2.7	8.7
	NIS	100	SL	0.25 % v/v	PO1						
7	Roundup PowerMax	5.5	L	0.5 lb ai/a	PO1	5.0	3.7	9.0	10.0	7.0	10.0
8	Untreated					1.7	4.0	4.0	4.0	4.0	6.7
LSD P=.05						2.37	5.67	7.18	6.73	6.02	5.34
Standard Deviation						1.35	3.24	4.10	3.85	3.44	3.05
CV						48.42	73.3	63.04	55.59	77.79	38.13

Performance of Glufosinate on Caneberry - IR4 - HTRC - 2018

Project Code: 131-18-2

Location: East Lansing, MI
Block 128

Personnel: Bernard H. Zandstra, Nicole Soldan
 Crop: Raspberry Variety: Caroline
 Planting Method: Transplant Planting Date: 2009
 Spacing: Solid row Row Spacing: 10 ft.
 Tillage Type: Conventional Study Design: RCB
 Plot Size: 5.3 ft wide x 30 ft long

Harvest Date: See notes
 Replications: 3

Soil Type: Spinks loamy sand OM: 2.1% pH: 7.0
 Sand: 66% Silt: 21% Clay: 13% CEC: 6.0

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PO1	4/18	10:30 AM	37/36	F	Moist	3-6 SW	66	100% Cloudy	N
PO2	5/16	11:35 AM	79/62	F	Moist	1-2 SW	53	30% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/18	RASP		Dormant	
4/18	QUGR = Quackgrass	2-3"	Veg	Moderate
4/18	BHPL = Buckhorn Plantain	2-3"	Veg	Few
4/18	DAND = Dandelion	2-3"	Veg	Few
4/18	PERG = Perennial Ryegrass	2-3"	Veg	Many
4/18	WHCL = White Clover	1-2"	Veg	Many
4/18	WICA = Wild Carrot	1-2"	Veg	Many
5/16	QUGR = Quackgrass	6-10"	Veg	Moderate
5/16	BHPL = Buckhorn Plantain	4-8"	Rosette	Moderate
5/16	WHCL = White Clover	2-4"	Veg	Moderate-many
5/16	WICA = Wild Carrot	3-4"	Rosette	Few
	YEFT = Yellow Foxtail			
	YENS = Yellow Nutsedge			

Notes and Comments

- Spray applied with 2 nozzle shielded boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer. One pass on each side of row.
- Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
- Harvested 10 feet of each plot on 8/23/18, 8/30/18, and 9/7/18.

**Performance of Glufosinate on Caneberry - IR4 -
HTRC - 2018**

Michigan State University

Performance of Glufosinate on Caneberry - IR4 - HTRC - 2018

Trial ID: 131-18-2
Protocol ID: 131-18-2

Location: East Lansing, MI
Investigator: Dr. Bernard Zandstra

Trial Year: 2018

Pest Code					QUGR	BHPL	DAND	WHCL		
Crop Code					RASP					
Rating Date					01May18	01May18	01May18	01May18		
Rating Type					RATING	RATING	RATING	RATING		
Rating Unit					1-10	1-10	1-10	1-10		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate Unit	Growth Stage					
1	Rely 280	2.34 L		0.75 lb ai/a	PO1,PO2	1.7	7.7	8.3	8.3	8.0
	NIS	100 SL		0.25 % v/v	PO1,PO2					
2	Rely 280	2.34 L		1 lb ai/a	PO1,PO2	1.3	8.0	8.3	8.3	9.3
	NIS	100 SL		0.25 % v/v	PO1,PO2					
3	Rely 280	2.34 L		1.5 lb ai/a	PO1,PO2	1.3	8.7	8.7	9.0	9.3
	NIS	100 SL		0.25 % v/v	PO1,PO2					
4	Untreated Weed-Free					1.0	1.0	3.3	1.0	1.7
	LSD P=.05					1.10	0.67	3.60	1.66	2.13
	Standard Deviation					0.55	0.33	1.80	0.83	1.07
	CV					41.46	5.26	25.16	12.5	15.07

Pest Code					WICA		QUGR	BHPL	WHCL	
Crop Code						RASP				
Rating Date					01May18	16May18	16May18	16May18	16May18	
Rating Type					RATING	RATING	RATING	RATING	RATING	
Rating Unit					1-10	1-10	1-10	1-10	1-10	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate Unit	Growth Stage					
1	Rely 280	2.34 L		0.75 lb ai/a	PO1,PO2	8.3	1.0	7.0	8.0	7.3
	NIS	100 SL		0.25 % v/v	PO1,PO2					
2	Rely 280	2.34 L		1 lb ai/a	PO1,PO2	8.3	1.3	8.0	6.3	9.3
	NIS	100 SL		0.25 % v/v	PO1,PO2					
3	Rely 280	2.34 L		1.5 lb ai/a	PO1,PO2	9.3	1.3	8.7	5.3	9.7
	NIS	100 SL		0.25 % v/v	PO1,PO2					
4	Untreated Weed-Free					4.0	1.0	3.0	5.0	4.0
	LSD P=.05					6.45	0.88	2.31	4.94	5.12
	Standard Deviation					3.23	0.44	1.15	2.47	2.56
	CV					43.03	37.8	17.32	40.09	33.76

Performance of Glufosinate on Caneberry - IR4 - HTRC - 2018

Pest Code					QUGR	YEFT	BHPL	DAND		
Crop Code					RASP					
Rating Date					31May18	31May18	31May18	31May18		
Rating Type					RATING	RATING	RATING	RATING		
Rating Unit					1-10	1-10	1-10	1-10		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate Unit	Growth Stage					
1	Rely 280	2.34	L	0.75 lb ai/a	PO1,PO2	1.7	8.0	8.0	9.3	9.7
	NIS	100	SL	0.25 % v/v	PO1,PO2					
2	Rely 280	2.34	L	1 lb ai/a	PO1,PO2	1.3	8.0	7.0	9.0	10.0
	NIS	100	SL	0.25 % v/v	PO1,PO2					
3	Rely 280	2.34	L	1.5 lb ai/a	PO1,PO2	1.3	7.7	7.0	8.7	10.0
	NIS	100	SL	0.25 % v/v	PO1,PO2					
4	Untreated Weed-Free					1.7	5.3	6.7	6.3	3.7
	LSD P=.05					1.76	3.63	3.00	4.26	2.40
	Standard Deviation					0.88	1.82	1.50	2.13	1.20
	CV					58.79	25.08	20.93	25.61	14.42

Pest Code					WHCL	WICA	YENS	RASP	QUGR	
Crop Code										
Rating Date					31May18	31May18	31May18	19Jun18	19Jun18	
Rating Type					RATING	RATING	RATING	RATING	RATING	
Rating Unit					1-10	1-10	1-10	1-10	1-10	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate Unit	Growth Stage					
1	Rely 280	2.34	L	0.75 lb ai/a	PO1,PO2	9.7	9.3	9.3	1.3	6.7
	NIS	100	SL	0.25 % v/v	PO1,PO2					
2	Rely 280	2.34	L	1 lb ai/a	PO1,PO2	10.0	9.7	9.3	1.3	8.7
	NIS	100	SL	0.25 % v/v	PO1,PO2					
3	Rely 280	2.34	L	1.5 lb ai/a	PO1,PO2	10.0	10.0	8.3	1.7	8.0
	NIS	100	SL	0.25 % v/v	PO1,PO2					
4	Untreated Weed-Free					4.0	4.0	8.0	2.0	6.3
	LSD P=.05					5.41	5.84	2.58	1.97	4.60
	Standard Deviation					2.71	2.92	1.29	0.99	2.30
	CV					32.17	35.45	14.75	62.27	31.06

Performance of Glufosinate on Caneberry - IR4 - HTRC - 2018

Pest Code	YEFT BHPL DAND WICA YENS									
Crop Code										
Rating Date	19Jun18	19Jun18	19Jun18	19Jun18	19Jun18					
Rating Type	RATING	RATING	RATING	RATING	RATING					
Rating Unit	1-10	1-10	1-10	1-10	1-10					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate Unit	Growth Stage					
1	Rely 280	2.34	L	0.75 lb ai/a	PO1,PO2	8.7	9.3	8.3	10.0	9.7
	NIS	100	SL	0.25 % v/v	PO1,PO2					
2	Rely 280	2.34	L	1 lb ai/a	PO1,PO2	6.7	10.0	7.7	10.0	8.0
	NIS	100	SL	0.25 % v/v	PO1,PO2					
3	Rely 280	2.34	L	1.5 lb ai/a	PO1,PO2	8.7	9.3	10.0	10.0	9.3
	NIS	100	SL	0.25 % v/v	PO1,PO2					
4	Untreated Weed-Free					8.0	8.0	6.0	7.3	9.3
	LSD P=.05					2.51	4.01	3.72	3.78	4.30
	Standard Deviation					1.26	2.01	1.86	1.89	2.15
	CV					15.73	21.89	23.29	20.28	23.71

Pest Code	RASP RASP RASP RASP									
Crop Code										
Rating Date	23Aug18	30Aug18	07Sep19							
Rating Type	HARVEST	HARVEST	HARVEST	TOTAL						
Rating Unit	KG/PLOT	KG/PLOT	KG/PLOT	KG/PLOT						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate Unit	Growth Stage					
1	Rely 280	2.34	L	0.75 lb ai/a	PO1,PO2	0.3300	0.6417	1.277	2.2483	
	NIS	100	SL	0.25 % v/v	PO1,PO2					
2	Rely 280	2.34	L	1 lb ai/a	PO1,PO2	0.2017	0.5917	1.313	2.1067	
	NIS	100	SL	0.25 % v/v	PO1,PO2					
3	Rely 280	2.34	L	1.5 lb ai/a	PO1,PO2	0.4017	0.7083	1.233	2.3433	
	NIS	100	SL	0.25 % v/v	PO1,PO2					
4	Untreated Weed-Free					0.2700	0.5550	1.183	2.0083	
	LSD P=.05					0.14686	0.12094	0.3854	0.48527	
	Standard Deviation					0.07350	0.06053	0.1929	0.24288	
	CV					24.43	9.7	15.41	11.16	

Weed Control in Raspberry - Clarksville - 2018

Project Code: 131-18-1

Location: Clarksville, MI
Tier

Personnel: Bernard H. Zandstra, Nicole Soldan
 Crop: Raspberry Variety: Caroline
 Planting Method: Transplant Planting Date: 2009
 Spacing: Solid Row Row Spacing: 10 ft
 Tillage Type: Conventional Study Design: RCB Replications: 3
 Plot Size: 5.3 ft wide x 30 ft long

Soil Type: Lapeer sandy loam OM: 2.7% pH: 6.5
 Sand: 39% Silt: 40% Clay: 21% CEC: 6.9

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	4/23	1:00 PM	64/46	F	Moist	6-8 NE	39	55% Cloudy	N
PO1	6/28	1:15 PM	88/70	F	Dry	3/5 NW	50	10% Cloudy	N

Crop and Weed Information at Application

Date	Crop/Weed	Height or Diameter	Growth Stage	Density
4/23	RASP		Dormant	
4/23	ANBG = Annual Bluegrass	2-3"	Veg	Many
4/23	QUGR = Quackgrass	2-4"	Veg	Moderate
4/23	BHPL = Buckhorn Plantain	2-3"	Veg	Few
4/23	DAND = Dandelion	3-4"	Veg	Moderate
4/23	RESO = Red Sorrel	0.5-1"	2-3 LS	Moderate
4/23	WHCA = White Champion	2-3"	Rosette	Moderate
6/28	QUGR = Quackgrass	6-12"	Seed	Few
6/28	YEFT = Yellow Foxtail	2-12"	Veg	Many
6/28	BHPL = Buckhorn Plantain	10-12"	Flower	Moderate
6/28	CATH = Canada Thistle	18-24"	Flower	Few
6/28	DAND = Dandelion	6-10"	Flower	Moderate
6/28	HOWE = Horseweed	4-10"	Veg	Few
6/28	ROFB = Rough Fleabane	6-12"	Flower	Few
	LACG = Large Crabgrass			

Notes and Comments

1. Spray applied with 4 nozzle boom PRE and 2 nozzle shielded boom PO1 DIR. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
3. Use Select Max 0.125 to control grasses postemergence.
4. Yields were not taken.

Weed Control in Raspberry - Clarksville - 2018

Michigan State University

Weed Control in Raspberry - Clarksville - 2018

Trial ID: 131-18-1
Protocol ID: 131-18-1

Location: Clarksville, MI
Investigator: Dr. Bernard Zandstra

Trial Year: 2018

Pest Code					QUGR	REFE	CATH	DAND	YEFT		
Crop Code					RASP						
Rating Date					04Jun18	04Jun18	04Jun18	04Jun18	04Jun18	04Jun18	
Rating Type					RATING	RATING	RATING	RATING	RATING	RATING	
Rating Unit					1-10	1-10	1-10	1-10	1-10	1-10	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Unit	Stage					
1	Karmex	80 DF		3.2 lb ai/a	PRE	1.0	8.0	6.7	7.7	4.3	7.0
2	Callisto	4 SC		0.188 lb ai/a	PRE	2.0	4.7	6.3	10.0	7.0	1.0
3	Sinbar	80 WDG		1.6 lb ai/a	PRE	1.3	9.7	8.3	10.0	7.3	8.3
4	Solicam	80 DF		4 lb ai/a	PRE	1.0	9.0	8.7	6.0	4.7	10.0
5	Casoron 170 CS	1.4 CS		3 lb ai/a	PRE	2.0	8.7	8.3	10.0	6.3	1.0
6	Prowl H2O	3.8 CS		4 lb ai/a	PRE	1.7	7.7	7.7	6.7	7.7	9.3
7	Chateau SW	51 WDG		0.192 lb ai/a	PRE	2.3	9.7	7.3	7.7	7.7	8.3
8	Alion 200	1.67 SC		0.065 lb ai/a	PRE	1.7	9.3	7.7	10.0	6.0	10.0
9	Matrix	25 DF		0.063 lb ai/a	PRE	1.7	10.0	9.7	10.0	9.7	9.7
10	Zeus Prime XC	3.5 EC		0.375 lb ai/a	PRE	1.3	6.7	7.3	6.3	3.7	6.3
11	Karmex	80 DF		2 lb ai/a	PRE	1.0	8.7	7.7	10.0	2.7	9.0
	Quinstar	3.8 L		0.375 lb ai/a	PO1 DIR						
12	Karmex	80 DF		2 lb ai/a	PRE	1.3	9.0	8.7	9.0	5.0	8.3
	Stinger	3 L		0.125 lb ai/a	PO1 DIR						
	LSD P=.05					1.31	2.91	3.02	4.50	3.02	3.90
	Standard Deviation					0.77	1.72	1.78	2.66	1.78	2.30
	CV					50.53	20.45	22.68	30.85	29.69	31.28

Weed Control in Raspberry - Clarksville - 2018

Pest Code					LACG	QUGR	YEFT	BHPL			
Crop Code					RASP				RASP		
Rating Date					25Jun18	25Jun18	25Jun18	25Jun18	25Jun18	11Jul18	
Rating Type					RATING	RATING	RATING	RATING	RATING	RATING	
Rating Unit					1-10	1-10	1-10	1-10	1-10	1-10	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage						
1	Karmex	80	DF	3.2 lb ai/a	PRE	1.7	4.7	3.3	4.7	5.3	1.0
2	Callisto	4	SC	0.188 lb ai/a	PRE	2.7	1.7	1.0	3.3	9.0	1.7
3	Sinbar	80	WDG	1.6 lb ai/a	PRE	2.3	8.3	9.0	8.3	10.0	1.0
4	Solicam	80	DF	4 lb ai/a	PRE	2.3	9.3	8.7	10.0	7.3	1.3
5	Casoron 170 CS	1.4	CS	3 lb ai/a	PRE	3.3	1.7	4.0	1.0	10.0	2.7
6	Prowl H2O	3.8	CS	4 lb ai/a	PRE	1.3	6.3	6.3	6.3	5.3	2.0
7	Chateau SW	51	WDG	0.192 lb ai/a	PRE	3.0	1.7	3.3	3.0	10.0	1.7
8	Alion 200	1.67	SC	0.065 lb ai/a	PRE	3.0	7.7	7.0	7.7	10.0	1.7
9	Matrix	25	DF	0.063 lb ai/a	PRE	2.7	8.0	8.3	8.0	3.7	1.3
10	Zeus Prime XC	3.5	EC	0.375 lb ai/a	PRE	2.0	2.7	3.0	3.7	7.7	1.7
11	Karmex Quinstar	80 3.8	DF L	2 lb ai/a 0.375 lb ai/a	PRE PO1 DIR	1.3	4.7	7.0	5.3	4.0	1.0
12	Karmex Stinger	80 3	DF L	2 lb ai/a 0.125 lb ai/a	PRE PO1 DIR	1.7	2.3	5.3	3.3	1.7	1.3
LSD P=.05						1.92	3.02	4.58	3.54	5.30	1.19
Standard Deviation						1.13	1.79	2.71	2.09	3.13	0.71
CV						49.77	36.32	48.98	38.75	44.75	46.17

Pest Code					YEFT	QUGR	DAND	BHPL	RASP		YEFT	HOWE
Crop Code					11Jul18		11Jul18		22Aug18		22Aug18	
Rating Date					RATING	RATING	RATING	RATING	RATING	RATING	RATING	RATING
Rating Type					1-10	1-10	1-10	1-10	1-10	1-10	1-10	1-10
Rating Unit												
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage							
1	Karmex	80	DF	3.2 lb ai/a	PRE	6.0	3.0	4.3	4.7	1.3	7.0	9.0
2	Callisto	4	SC	0.188 lb ai/a	PRE	1.0	2.3	5.7	9.0	1.7	2.3	10.0
3	Sinbar	80	WDG	1.6 lb ai/a	PRE	7.0	7.3	7.3	8.3	1.3	9.3	10.0
4	Solicam	80	DF	4 lb ai/a	PRE	9.3	6.3	2.3	2.3	2.7	10.0	10.0
5	Casoron 170 CS	1.4	CS	3 lb ai/a	PRE	1.0	5.7	5.0	9.3	2.3	5.7	10.0
6	Prowl H2O	3.8	CS	4 lb ai/a	PRE	3.3	3.3	1.7	6.3	1.3	6.0	8.3
7	Chateau SW	51	WDG	0.192 lb ai/a	PRE	4.3	2.0	6.3	7.7	1.7	5.3	9.3
8	Alion 200	1.67	SC	0.065 lb ai/a	PRE	2.0	4.0	1.7	9.7	3.0	4.7	8.0
9	Matrix	25	DF	0.063 lb ai/a	PRE	1.3	4.3	3.7	1.7	3.3	3.0	6.0
10	Zeus Prime XC	3.5	EC	0.375 lb ai/a	PRE	1.7	1.0	1.7	5.0	2.3	8.0	10.0
11	Karmex Quinstar	80 3.8	DF L	2 lb ai/a 0.375 lb ai/a	PRE PO1 DIR	8.3	6.7	2.7	2.3	1.7	9.3	10.0
12	Karmex Stinger	80 3	DF L	2 lb ai/a 0.125 lb ai/a	PRE PO1 DIR	8.7	7.7	7.0	6.3	1.3	10.0	10.0
LSD P=.05						2.24	3.74	3.78	4.32	1.31	3.94	3.41
Standard Deviation						1.32	2.21	2.23	2.55	0.77	2.33	2.01
CV						29.4	49.34	54.34	42.14	38.68	34.59	21.84