Weed management in hops

Diane Brown, Extension Educator,
Michigan State University

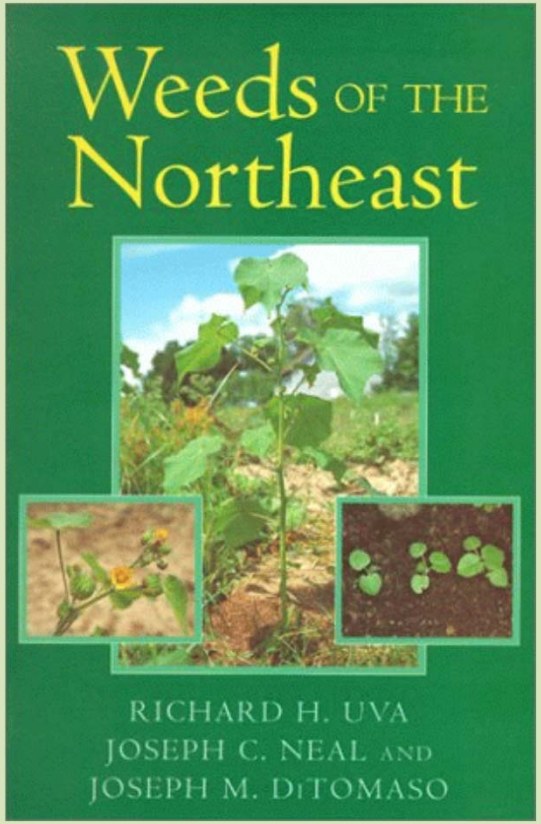
Why control weeds?

- Compete for water, nutrients and light
- Can harbor diseases and insect pests
- Reduce crop quality and yield
- Make harvest more difficult

Identify the weeds

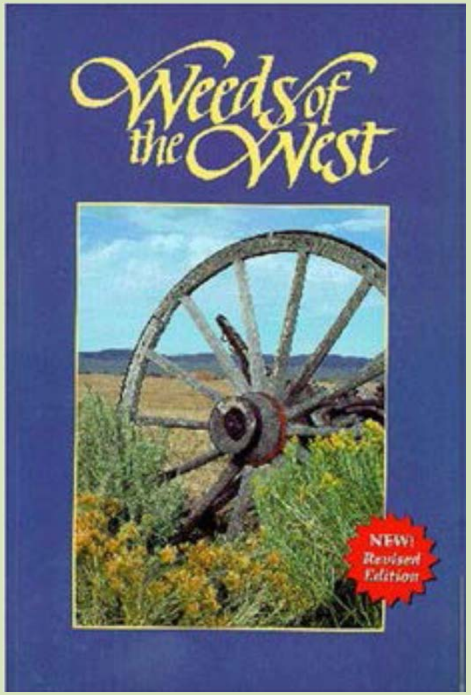
- Grass or broadleaf,
- annual, biennial, perennial
- Why it matters…
- Affects the treatment choices and timing

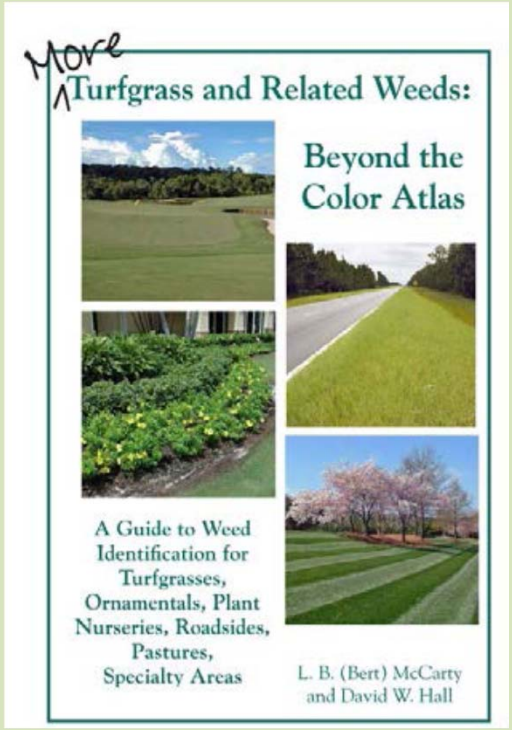
Weed Identification Publications (1)



"Weeds of the Northeast"
-R. Uva, J. Neal, and J. DiTomaso

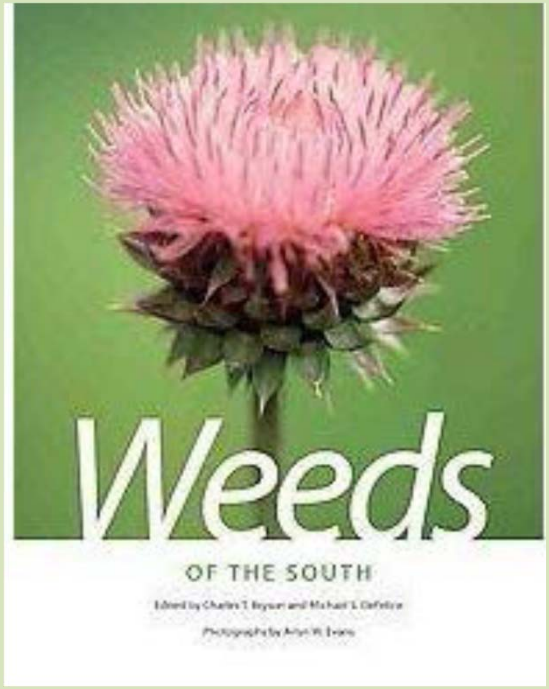
"Weeds of the West"
L. Burrill, S. Dewey, D. Cudney, B. E. Nelson and T. Whitson



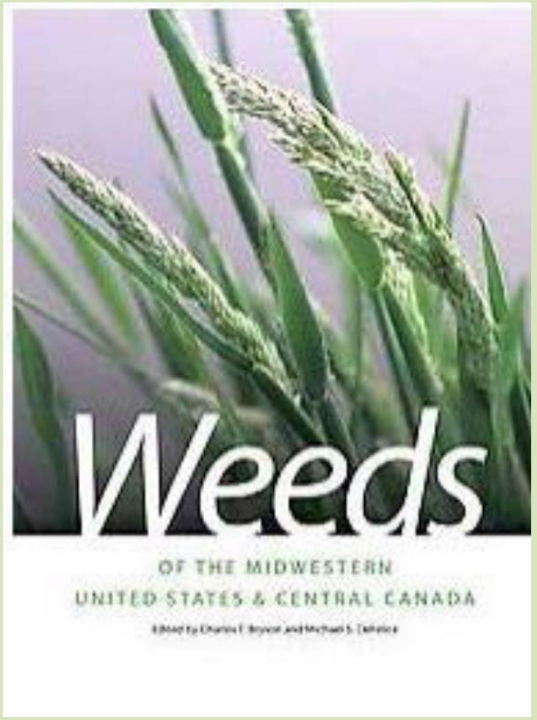


"More Turfgrass and Related Weeds: Beyond the Color Atlas"
-L.B. McCarthy & D.W. Hall

Weed Identification Publications (2)

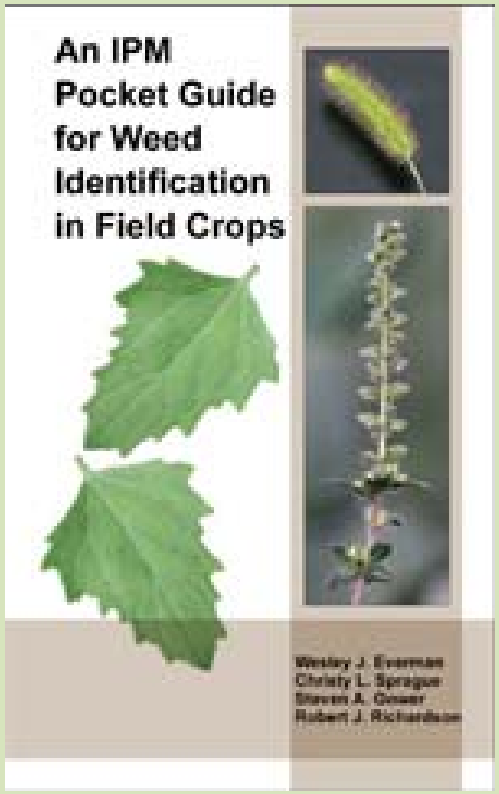


"Weeds of the South"
-Charles T. Bryson &
Michael S. DeFelice.

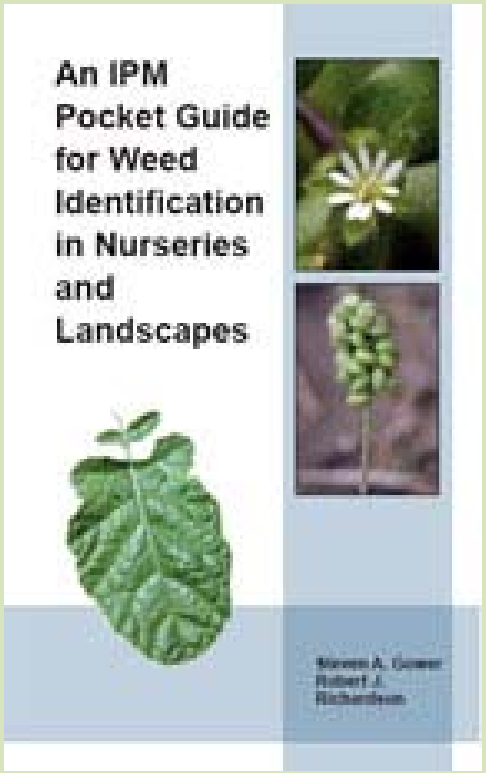


"Weeds of the Midwestern
United States & Central Canada"
-Charles T. Bryson &
Michael S. DeFelice

Weed Identification Publications (3)



"An IPM Pocket Guide for Weed Identification in Field Crops"
-Wesley Everman, Christy Sprague, Steven Gower, & Robert Richardson E-3081



"An IPM Pocket Guide for Weed Identification in Nurseries and Landscapes" Steven Gower, & Robert Richardson E-2982

Winter Annual

produces a rosette of leaves in fall, goes dormant over winter, resumes growth in spring

Summer Annual

Emerges in the spring sets seed in late summer/fall and dies

Biennial

- A weed that lives longer than 1 year, but less than 2 full years. The plant often grows vegetatively during the first year, then flowers and dies during the second year.

Perennial

- A weed that lives longer than 2 full years, often reproducing vegetatively by horizontal shoots, roots, or rhizomes, as well as by seed.

If at all possible-CONTROL PERENNIAL WEEDS BEFORE PLANTING A HOPYARD

Mechanical weed control

- In mechanically cultivated systems, tillage (4 to 6 inches) should begin as weeds appear,
- followed by shallow cultivation (2 to 4 inches) until after lateral hop branches have developed.
- Over time, cultivation has been shown to decrease soil quality, and in hilly areas, it can lead to erosion problems.

Mechanical weed control

- Mulch has been shown to suppress weeds in hop systems and over time can increase moisture retention and improve long-term soil quality

Using herbicides to manage weeds:

1. Identify weeds to family and genus if possible.
2. It is normally easier to control weeds preemergence than postemergence.
3. For perennials, attack them at several stages during the year.

Which of these commonly used herbicides are registered for use in hops in Michigan?

- Aim EC (carfentrazone) post emergence herbicide
- Gramoxone (paraquat) post emergence herbicide
- Roundup (glyphosate) post emergence herbicide
- Chateau (flumioxazin) pre emergence herbicide
- 2,4 D post emergence herbicide
- Select Max- pre emergence herbicide

Pre-emergence herbicides

- apply to the soil surface before weed and grass emergence and growth have begun.
- how they work-kill emerging weed seedlings or prevent weed seed germination.
- Pre-emergence herbicide rates usually vary according to soil type

Post-emergence herbicides

- selective (they target specific weeds)
- non-selective (they kill a wide range of plant species)

Preemergence herbicides

- Applied before weeds emerge
- Broadleaf weeds and grasses
- Solicam DF (norflurazon)
- Application to hops should be at least 6 months after planting

Coarse soils	Medium soils	Fine soils
Sand, loamy sand, sandy loam	Loam, silt loam, silt, sandy clay loam	Sandy clay, clay loam, silty clay loam, silty clay, clay
2.5 lb/treated acre	3.75 lbs/treated acre	5.0 lb/treated acre

Preemergence herbicides

- Applied before weeds emerge
- Broadleaf weeds and annual grasses
- Treflan(trifluralin)
- Apply during dormancy- amounts per treated acre

Soil texture	Treflan 4 EC, Treflan 4L and Treflan HFP	Treflan TR-10
coarse	1.0 pt/A	5 lb/A
medium	1.25-1.5 pt/a	6.25-7.5 lbs.
fine	1.5 pt/A	6.25-7.5 lbs/A

Post emergence herbicides

- Applied to emerged weeds
- Glyphosate (Roundup, and others) 14 d PHI, 4 hr REI
- Apply only when green shoots, foliage or bines are not in the spray zone
- Weed control in row middles, preplant , strips
- Rates vary: 22 fl oz/ A in 16-40 gal water for weeds less than 6”
- Apply to actively growing weeds.
- Finalsan Total Vegetation Killer- ammoniated soap of fatty acids- spot treatment OMRI listed

Treated acres vs. sprayed acres

- Herbicide example- 1 acre =43,560 sq ft.
- Product applied in bands over the row
- 4 ft. band x 10,890 ft.=one treated acre
- field acres x $\frac{\text{band width ft.}}{\text{row width in ft.}}$ = treated acres
- 1 acre x $\frac{4 \text{ ft}}{14 \text{ ft.}}$ = .2857 treated acres
- .2857A x 3.5 field acres = 1 treated acre

Weed Identification Websites

- Weed Science Society of America Weed ID: http://www.wssa.net/Weeds/ID/index.htm
- Identifying Weeds in Field Crops: http://www.ipm.msu.edu/weeds-field.htm
- MSU Turf Weeds: http://msuturfweeds.net/
- Midwestern Turfgrass Weed Identification and Control: http://www.turf.uiuc.edu/weed_web/index.htm
- University of Illinois Weed Science: http://weeds.cropsci.illinois.edu/weedid.htm

References and acknowledgements:

- Herbicide and Adjuvant Selection and Use in Vineyards, Dr. Bernard Zandstra, MSU
- An IPM Pocket Guide for Weed Identification in Nurseries and Landscapes, Steve Gower and Rob Richardson
- University of California IPM website-UC IPM Online Weed Identification
- http://www.ipm.ucdavis.edu/PMG/WEEDS/ID/idcharac.html