EQUIPMENT

Transplanters and Seeders

AUTHORS & INSTITUTIONS

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SECTIONS

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INTRODUCTION

Seeders and Transplanters are both used to place plant material into the ground at a consistent spacing. Seeders place seeds, or seed-pieces, and transplanters place small seedling plants.

Seeders

All seeders pick up seed from a hopper, drop it into the ground at an adjustable depth and cover it. However, there are different styles of meters that are used to space that seed out within the rows. They all strive to dribble or singulate seed at specific depths and spacings. They can be tractor mounted or some can be used on foot.

Walking stick planters, such as the Stand 'n Plant, are great for small acreages of large spaced crops, large-seeded crops, and even tighter spaced, large-seeded crops. They also work well for poking seeds through plastic mulch.

Gravity-fed roller-style (Jang JP) or belt-style (Stanhay) seeders, are for small acreages, and can be set up to plant one or multiple rows at a time or tractor mounted. They are good for dense small-seeded crops. They use interchangeable rollers or belts with indentations in them to scoop seed out of a seed hopper and meter them out with a drive wheel and gearing. Johnny's Six-Row Seeder, Four-Row Pinpoint Seeder, and Glaser wheel hoe seeder attachment are also good with small-seeded vegetables for small scale farms. There are both push units and tractor-mounted units available.

Gravity-fed plate-style seeders, such as the Jang TD, Hoss Garden Seeder, and Earthway Seeder are good for larger-seeded and some small-seeded crops. They use interchangeable plates that scoop seeds of different sizes out a seed hopper and meter them out with a drive wheel and gearing. These are the standard for smaller scale vegetable operations, with a huge number of plates for any seed size or shape. However, they lack reliable singulation of small seed. There are both push units and tractor-mounted units available.

Another type of gravity-fed plate-style seeder is a Planet Jr., which uses a stationary plate and a rotating agitator driven by the front wheel that wiggles inside the seed hopper to dribble seed into a hole in the plate. The plate itself has holes of several sizes that can be repositioned for crops with different seed sizes. This type of unit does not singulate at all, but makes a line of seed that needs thinning later. There are both push units and tractor-mounted units available.

Finger pickup seeders, such as the John Deere 7000 use metal tines to scoop seeds out of a hopper. They are limited to about 12 tines of one size for large and round seeds. Some growers remove every other metal finger to plant pumpkins. They are singulated with a brush. In-row spacing is determined by how fast it spins. Older units use a drive wheel and gearing, and new models use hydraulic or electric systems to meter seed independent of ground speed. Many row units can be added to a toolbar. There are only tractor-mounted units.

Vacuum and plate-style seeders use a plate with holes drilled in it and a vacuum to suck seed from a hopper onto the plate. They are singulated with metal tabs. In-row spacing is determined by how fast the plate spins, the number of holes on the plate and vacuum pressure. Older units use a drive wheel and gearing, and new models use hydraulic or electric systems to meter seed independent of ground speed. Many row units can be added to a toolbar. These are the standard for larger scale vegetable operations, with a huge number of plates for any seed size or shape and a gold-standard for singulation. Many companies make them, including Monosem, John Deere, Stanhay, and Wizard. There are both push units and tractor-mounted units available.

Seeds can also be placed in soil under plastic mulch with special tools. The aforementioned walking stick planters work well for this in small scales. For larger scales, a push-style Poly Planter Jr. or tractor-mounted Drum Punch Planter or Poly Planter combine vacuum seeder technology above with a dibbling mechanism that rolls and pokes holes in plastic for depositing seed.

Transplanters

All transplanters open the soil, insert a plant and some tamp soil around the plant. However, not all transplanters are equal for all applications. The oldest style of transplanting is using a hoe to make a hole, placing in a plant, and packing it in with your feet or hands.

A walking tube-style hand transplanter is good for expanding gardens into higher production acreage. They go by names like Stand 'n Plant, and Pottiputki.

Waterwheel transplanters can be used on bare ground and plastic beds. They roll drums along the ground with triangular inserts that determine in-row plant spacing like a dibble. You can add a drum to do closely-spaced twin-rows. Water is gravity fed into the drums, then pours out of the hole where the triangles are, and you stick your transplant right into the water-soaked hole. Note, if you use any fertilizers or chemicals in the transplant water, workers should wear gloves. Sometimes it helps to send someone behind the transplanter with a hoe or shovel to make sure the transplants are fully-seated and covered with soil. Most of these straddle one row and seat one to four people.

Finger-style transplanters do not function on plastic beds because they have a disc-opener and shoe to make a furrow like a traditional seeder that would slit the plastic. They have been traditionally used for evenly balanced bare root-stock without a weighted-end (asparagus, hops, strawberries, sweet potatoes, onions, cole crops). These transplanters work by two metal fingers that pinch a leather or rubber strap like a baseball mitt's pocket. The fingers open the pocket for a worker to place a transplant, and pinch closed on it as it brings the transplant down into the furrow. These finger units are arranged in a series like the teeth of a chainsaw and a ground drive-wheel is geared to adjust in-row plant spacing. Water is gravity fed into the furrow as the transplant goes in. Chemicals can be added to this water without workers needing to touch it and there are closing wheels to pack the plant in. Finger-style transplanters do not handle "weighted-end" transplants well as the soil plug can clog up the slot where the finger grabbers pull the transplant through to the ground. They may be amenable to a reduced-tillage situation if a strip-tiller preceded it.

Carousel transplanters do not function on plastic beds for the same reasons as a finger-style transplanter; they cut a slit in the soil. They are excellent for plug-tray transplants, with a weighted-end. When the discs open a furrow, the transplant in the revolver tube is dropped in like a lawn dart and water is gravity fed in with it. A ground drive-wheel is geared to adjust in-row plant spacing. Chemicals can be added to this water without workers needing to touch it, and there are closing wheels that pack the plant in. These do not work very well for bare-roots transplants without a weighted-end. They may be amenable to a reduced-tillage situation if a strip-tiller preceded it.

Cup-style transplanters are designed for transplanting into plastic rows, but also work on bareground. These can be set up to transplant in close double-row configurations similar to a water wheel transplanter. A ground drive-wheel is geared to adjust in-row plant spacing. Chemicals can be added to this water without workers needing to touch it, and there are closing wheels that pack the plant in. They may be amenable to a reduced-tillage situation if a strip-tiller preceded it, but the cups need a soft soil to open properly.

PaperPot transplanters are perhaps the newest transplant systems. The PaperPot system utilizes specially-folded paper that accordions into a full transplant tray with 264 cells which are then packet with transplant media and seeded as you would normally start transplants. A special transplanting unit that you pull across the ground on foot deposits the special paper cell trays into the soil in a continuous chain of equally-spaced plants every 2, 4 or 6 inches. This system does not have a water injector, and needs to have a well-prepared soil before it can be efficiently pulled.

PlantTape and Agriplant NV transplanters bring the PaperPot concept to a larger scale. Though they work differently, when transplants are ready, they can be planted into one to eight rows and metered out to the desired population. The TTS transplanter can plug and place transplants from standard cell trays for automatic transplanting. In all cases these automatic transplanters only work in bare soil situations.

Bulb and Tuber Planters

Somewhere between seeds and live growing transplants are dormant bulbs and tubers like garlic and potatoes. These can be planted similarly with deeply-poked holes made with hand tools, or with middle-buster plows to pull a trench with a tractor.

Seed pieces can be dropped in by hand and a foot used to kick soil over them. Waterwheel transplanters can also work in a pinch.

More advanced systems combine the trenching, seed piece-dropping and burying in one smooth process.

Consistent seed piece size is important for proper mechanical planting. They are typically a ground-driven device with a large hopper and a series of cups on a chain that lift individual seed pieces from the hopper and drop them down a tube, a bit like a roller coaster. Brands include Garmach, Spedo, Spudnik, Willsie, and many more. The old Iron Age potato planter works just like a finger pickup seed hopper with a gravity feed hopper that concentrates seed pieces near a rotating finger wheel that lifts and carries seed to a drop point.

There are also assisted-feed planters from the US Small Farm Equipment Company that use a mechanism similar to a carousel transplanter to ensure that a seed piece is placed in every spot without skips or doubles. It requires a person to sit on the back and place the seed pieces.

How To Get Started

Start by talking to someone doing what you hope to do.

Perhaps go online and look up implements that you think would fit the scale of your operation, read their manuals and watch their instructional videos.

Then, go to a trade show or equipment dealership or a grower that has a lot of different things to learn more about its operation, support, and maintenance. Look for auctions and individuals selling used online.

SECTION 1

Transplanters & Seeders

Primary Considerations

- Determine what equipment you have for towing or powering a seeder or transplanter. Most require a three-point hitch at a minimum. Some require PTO power, and some are towed with a single hitch pin.
- Do you grow individual rows of this and that all jumbled together? If so, then a push-style seeder, with several interchangeable plates, belts, or rollers might be best for you. Tractors can carry many row units for large plantings with the same spacing.

Process for getting started

- Define your market goals and how much area you might need to plant at a time. Does the size or shape of that area change throughout the year? This would help determine what sort of equipment you would use, or could result in re-arranging fields to accommodate a seeder or transplanter of a certain design.
- Talk to a mentor.
- Research equipment online.
- Visit a trade show or dealership.

Disclaimer: For a specific list of resources in the above description, view the Necessary Resources area of this section.

TRANSPLANTERS & SEEDERS

COMMON QUESTIONS

01 Why is seed singulation and seed placement important?

Having seeds or plants in a predictable location along a row and between rows allows for predictable weed control and yield estimations later on.

02 How do I know how much seed or plant material to plant?

The best way to understand what amount of product to grow is to know your markets. Once you understand what your production benchmarks need to be for a given set of days, weeks, or months, you can plan backwards from those target dates to account for growth time, greenhouse time, or germination time. Once you know your output goals and your area, you need to calibrate your seeder or transplanter.

03 How do I calibrate?

When using a new seeder or transplanter, consult the manual and stickers affixed to the units. You can check against the documentation provided by lifting a seeder over a bucket, and spinning the drive wheel one full revolution to catch seed. Measure the circumference of the wheel in inches and divide by 12 to get ft per revolution. Then divide the number of seeds caught by the feet per revolution to determine seeds dropped per foot. Small seeded crops need to be closer to 9-12 seeds per foot, and larger crops need to be closer to 1-3 seeds per foot.

04 When should I seed or plant?

Warm-season crops need soils to be over 50 degrees F. Cool-season crops can be seeded or transplanted with soil temps in the 40's.

05 Can all seeders plant all types of seeds?

No. Each seeder has its own tolerances for seed size or shape, but all seeders will handle spherical seed well. The metering parts of vacuum seeders, belt seeders and roller seeders can be shaped so that flat, pointy, or oblong seeds can pass through, but they do not singulate them very well. For smaller growers, Earthway push seeders work best for larger seed, and Jang seeders work best for smaller seed.