



What is a Mechanical Transplanter?

Mechanical transplanters are used in agricultural crop production to automate the planting process of seedlings, plugs, slips, and tubers. These machines offer solutions to enhance transplanting precision while maximizing labor efficiency. Different models are specifically designed to operate in various soil conditions and production systems, including sandy or heavy clay soils, bare ground, no-till, and plasticulture. Learn more about the operations, uses, functions, and advantages of mechanical transplanter use in the information below.

How Does It Work?

Mechanical transplanters mount to the rear of the tractor and options are available for pull-type or 3-point hitch connections. Aside from the tractor operator, at least one additional person is required to sit in the seat on the unit to supply the plants to the transplant distributor. Prior to field operations, the machine's operating height, depth, and plant spacing must be set. Once calibrated, the tractor slowly pulls the transplanter through the field opening a planting furrow or punching a planting hole for the transplant to enter the soil at the preset spacing. These semi-automatic machines are propelled by a wheel drive that activates the chain and gear mechanism for the transplant distributor that rotates and drops the transplants. Once dropped from the distributor into the soil, covering discs, pressing wheels, or skis will straddle the planting row to ensure consistent soil-to-root compaction and coverage. Optional watering devices with adjustable output flow rates can be mounted to the machine's frame so crop and climate-specific water demands are met to minimize post-transplant shock and increase the environmental adaptation process. Granular fertilizer applicators offer an upgrade to further optimize crop production.



Functionality

Once trained and acclimated to the machinery, farmers report planting rates of 4,500-6,000 plants per hour. Labor and time savings along with precise, efficient planting systems are key contributors in creating a more sustainable future for farmers.

Application

Crop Production: No-till, reduced-till, plasticulture, row cropping, organic crop production, conventional crop production



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Key Components

- **Drive System:** The independent wheel drive activates the drive shaft, chain, and sprocket gear mechanism responsible for transplant distribution and spacing. The chain and sprockets can be adjusted to set the desired in-row spacing.
- **Transplant Distributor:** Fingerstyle or gripper type transplanters are used to plant slips, bare roots and plugs in bare soil. These are best known for sweet potato slip production. Ferris-wheel style transplanters are designed with pointed planting cups that punch a planting hole then open to drop plugs into bare soil or plastic mulch production. Carousel style transplanters are best suited for transplanting plugs into bare soil, no-till, and roller crimped production. A variation of the carousel style transplanter is used for seed potatoes, bulbs, and other tubers.
- **Pressing Wheels:** These wheels can be plastic, rubber, or stainless steel. Once the plants drop into the soil, the wheels press the soil in and around the transplant for proper soil contact and coverage. The wheels are adjustable, and the material should be decided based on soil or production type.



- **Depth Control:** The furrow and punch hole are adjustable for precise control of the planting depth
- **Frame:** The operator weight is held by the tractor and hitch, not on the actual transplanter unit.
- **Tray Holder:** Steel racks or carousel style tray holders provide space to carry multiple nursery trays on the unit while working in the field.
- **Mounting Mechanism:** The 3-point hitch connection is the most common for smaller scale producers but pull-type connections with hydraulics are available for larger, more advanced designs.
- **Watering Device:** A barrel-style watering device can be mounted to the frame of the machine to provide automated watering at the set plant spacing.





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Safety Tips

1. Make sure tractor is stopped and in neutral with the transplanter lowered to the ground before getting on /off the unit.
2. No operator is allowed to be on the unit as it is raised and lowered.
3. No operator is allowed on the transplanter as it is transported to or from the field.
4. All operators must be seated before movement begins and remain seated until the transplanter is completely stopped.
5. Never leave the transplanter in the raised position
6. Keep all shields and guards in place when operating the transplanter.
7. Never attempt repairs or maintenance while the transplanter is in motion.
8. Never put the tractor in reverse while the transplanter is on the ground.
9. Follow all safety instructions supplied by the tractor manufacturer to which the transplanter is mounted.



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Mechanical Transplanter Usage

- **Preparation:** The field and soil preparations need to align with your specific production system. If using a Ferris-wheel style transplanter, a tillage method is recommended to loosen and till the soil. This style is compatible with bare ground or plastic mulch. If a gripper or carousel style transplanter is used, there are options for no-till, reduced till, or standard tillage methods. Whichever production systems or soil disturbance methods are used, attention to detail and planning should be a priority in field preparations for optimal equipment functionality.
- **Timing:** Allow fields to dry out for 1-2 days after standing water. Some moisture in the soil is beneficial for machine performance. Do not allow transplants to get overgrown as this can complicate the planting process. It is advised to plant earlier in the growth cycle. Transplants that get too tall or bushy are problematic and often unusable with certain transplanter styles.
- **Technique:** The tractor operator will drive slowly down the bed or row while the transplanter operator is seated on the unit. As the tractor pulls the transplanter unit with the wheel drive in contact with the ground, the transplant distributor wheel rotates either vertically or horizontally (dependent on the style), and the transplanter operator will pull plugs from the trays in the tray holder and place them in the distribution cups. Once the plugs are placed in the cups, the wheel will continue to rotate, the plants will go into the ground, followed by the pressing wheels that firm up the soil and secure the plant upright.
- **Adjustment:** The front arm, planting depth, plant spacing, press wheels, distributor opening, and water flow rate are adjustable, but the details vary based on the transplanter manufacturer and model. Consult the owner's manual for the specific guidelines.
- **Follow-up:** It can take time to dial in this machinery to maximize its efficiency potential. Observe how the transplanter responds to your soil conditions and confirm that the desired planting depth, spacing, soil compaction, and water distribution are achieved.

