

Sustainable Agriculture

Practical Farmers of Iowa Reducing Weed Pressure in Ridge-Till

General practices

1. For allelopathic weed control and soil conservation, drill a fall cover crop on the ridges only.
2. Allow early growth of weeds or cover crop to control later weeds.
3. Place NPK fertilizers in row bands to feed the crop and not the weeds. Planter fertilizer gives the crop a fast head start.
4. Do not use any kind of tillage ahead of the ridge-till planter. Shred tall growth if necessary.
5. Use a planter that will trim off the top and sides of the ridge, removing green growth and weed seed.
6. Rotary hoe before and after crop emergence. A spacing of 20 inches between front and rear gang is optimal in heavy residue.
7. Use a heavy duty cultivator that will cut close to the row and handle dense residues and weeds between the rows.
8. Planting rates of 12 seeds per foot for soybeans and a 7-inch spacing for corn creates early row canopy, giving advantage to crop over weeds.
9. Use varieties of corn and soybeans that have fast emergence, canopy early, yield well at high populations, and are tall.
10. A wide row spacing (36 inches to 38 inches) makes the above practices easier and accommodates the closer in-row plant spacing.
11. If the above techniques do not control the weeds, a banded postemergence herbicide can be spot-sprayed while cultivating the crop.

Planting on ridges

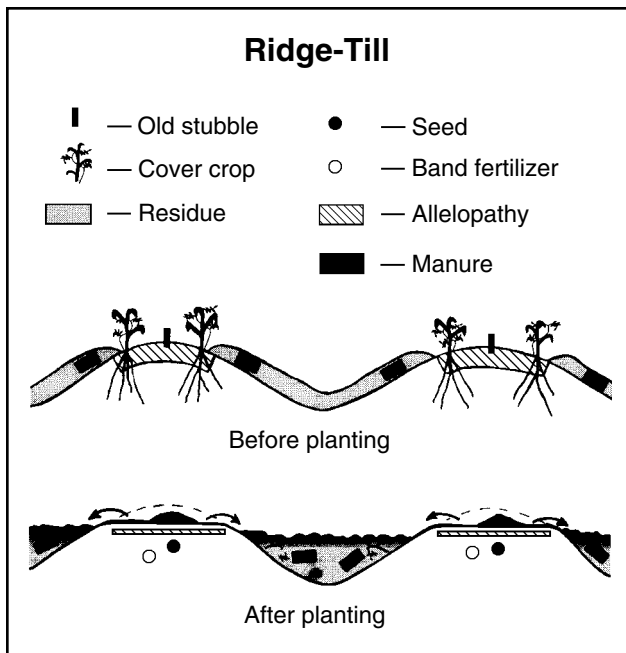
1. Do not use any kind of tillage ahead of the planter sweep.
2. Use the sweep and rear side plates (or equivalent equipment) to remove plants and weed seed from the top and sides of the ridge. Alternatively, extensions can be welded to the sweeps to bury more material between the rows.
3. Use plastic row covers to make sure all weed seed is removed from the row.
4. In moist soil, instead of disk openers use a runner seed opener with a "V" forming bar.
5. Pack seed with small 1-inch press wheel and cover seed with a crown of 2 to 2½ inches of loose soil.

Inside:

This fact sheet summarizes techniques for successful management of weeds in ridge-till cultivation, using mechanical and cultural controls as the "first line of defense."



Cover crop on the ridge tops will be removed by planter.



Ridges before and after planting.

Proper placement of all materials is the key.

2. Rotary hoe on a morning with bright sunshine and a good breeze. A larger hoe makes it easier to complete the job at the optimum time. A 30' hoe can cover 20 acres in an hour.
3. Preemergence rotary hoe the crop when corn has sprouted and weeds have a white hair root.



A 20-inch spacing between hoe gangs helps handle residue. The rear gang cleans the front one.

6. Do not use the scratchers on the planter if they are not needed to incorporate herbicide. Leave the crown of loose soil made by the cover disks.
7. Planters equipped for fertilizer:
 - 4-row mounted planter; dry fertilizer carried on the planter.
 - 6- to 12-row mounted planter; dry fertilizer in air cart behind planter. Liquid suspension tanks on planter lift wheels or tractor.
 - 6- to 12-row pull-type planter; dry fertilizer carried on the planter.
8. Fertilizer should be placed 2 inches from the seed, at or below seed level.

Rotary hoeing

1. A 20-inch spacing is needed between front and rear gangs to handle residue.



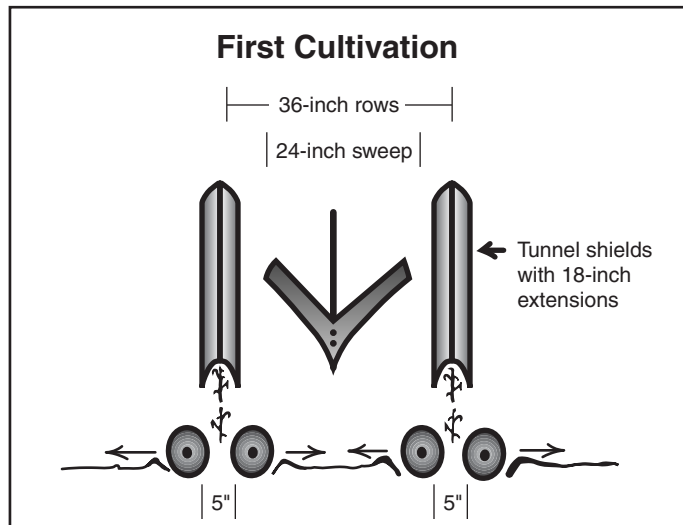
Side plates clean ridge shoulders. Plastic covers prevent weed seeds from falling back into row. Alternatively, extensions can be welded to planter sweeps to help bury weeds, manure, and cover crops between rows.

4. With extreme weed pressure, double rotary hoe preemergence. Half-lap the previous pass when going across the field, or go up and back in the same wheel tracks to maintain a controlled traffic pattern.
5. Get off the tractor to observe soil penetration and the sprouted crop. These observations will determine hoe depth and tractor speed.
6. The postemergence hoeing comes about seven days seven days after the preemergence trip. Both corn and soybeans should have true leaves.

- Record the dates of planting, sprouting, emergence, hoeing, and cultivation. This is important information for future weed management decisions.
- Cultivate as soon as possible to aerate the soil, speeding nutrient release. The ideal time is about seven days after the last rotary hoeing.

Cultivating the first time

- Disk hillers set close to the row (5 inches apart) are a must when not using preplant herbicides.
- Sweeps wide enough (24 inches in 36-inch rows), with 3-inch pitch, plowing deep enough to undercut all residue and turn soil over. Reduce pitch if residue clogs cultivator.
- Use tent-type tunnel shields with 18-inch rear extensions. Let shields drag in the soil.



Disk hiller spacing, sweep configuration, and tunnels for first cultivation.



Extension on tent shields drag the ground to protect the young crop at first cultivation.

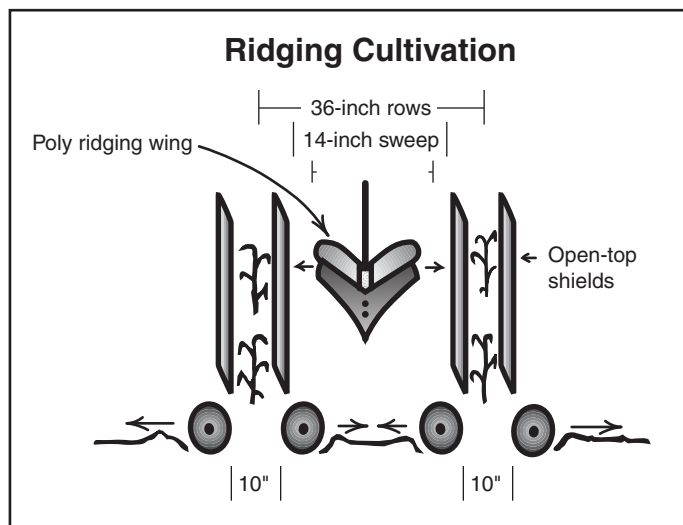
- Close cultivation requires looking ahead at all times.
 - When the crop is very small, the Cultivision© mirror or similar device allows the driver to sight one row as it goes through the cultivator.

You have to see what you are doing and protect the crop from machinery damage.

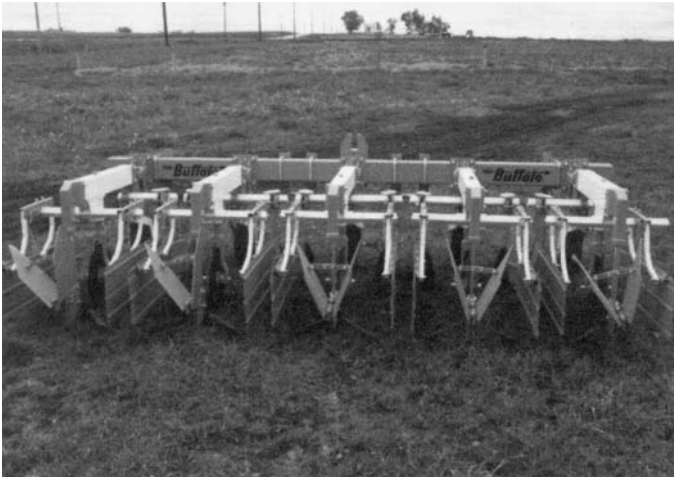
- A guidance system is useful for cultivating with contour farming and less powerful tractors.
- Ground speed of 4 mph on June 1 is appropriate, perhaps faster with a guidance system.

Second cultivation (ridging)

- Hillers set 10 inches apart.
- Use a shorter sweep (14 inches in 36-inch rows).
- Aggressive ridging wings behind sweeps cover weeds in the row.



Disk hillers, ridgers, and shields for the second cultivation.



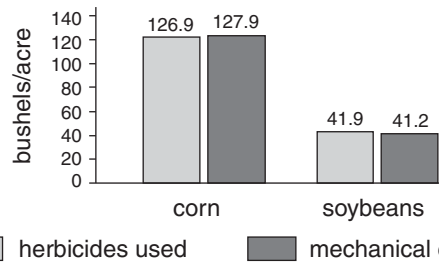
The elevation of open-top shields for second cultivation can be adjusted. Ridgers can be covered with plastic to reduce sticking.



These clean soybeans were grown with ridge tillage and no herbicides.

4. Tent tunnel shields are replaced by open-top shields, adjusted up or down for proper soil flow.
5. Nozzles can be positioned at lower front of each shield for post-emergence herbicide to be spot sprayed in the row as needed. Some prefer to mount the nozzles away from the cultivator.
6. Ground speed of 5 mph on June 15 is appropriate, perhaps faster with guidance system.

PFI 1987-91 weed control trials using ridge tillage.



17 corn trials, 26 soybean trials. Each trial: 6 replications, randomized

Savings

In the period 1989-91, savings when using only mechanical control averaged \$7.45 per acre in 11 corn trials, and \$7.81 per acre in 18 soybean trials.

Using ridge-tillage in replicated on-farm trials, Practical Farmers of Iowa show equivalent yields with and without herbicides.



RODALE INSTITUTE
222 MAIN STREET
EMMAUS, PA 18098

Prepared by Rick Exner, Iowa State University Extension/Practical Farmers of Iowa, based on Thompson On-Farm Research, Richard Thompson, Boone, Iowa. Edited by Dennis Melchert, Extension Communications.

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