

Six Things Your Mother Never Warned You About When Using Roller Crimpers

Troubleshooting Guide: Tips Tricks & Traps to Avoid Roller Crimper Failures



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Problem 1: Uneven cover crop termination after crimping

- When pulling a rear 3-point hitch mounted roller crimper, the tractor tires push cover crops down prior to contact with the blades, resulting in uneven crimping in the wheel tracks. Cover crops rebound in a few days, interfering with planting and weed suppression. While front mounting is recommended, a Laforge Systems (or equal) front 3-point hitch may cost more than a roller crimper; more than small farmers or trial users want to spend.
- Uneven fields from rocks, tire ruts, rough seedbed preparation previous fall or hard dry surfaces from low May soil moisture cause blades to bounce over uneven soil contact, even with the cylinder is weighted with water. Cover crops rebound and continue growing instead of dying and desiccating.



Solutions: Prepare a smooth fall seedbed, crimp with remaining soil moisture, drive in reverse if rear-mounted, and use burndown herbicide

- Prepare smooth cover crop seedbeds the previous fall. Avoid creating ruts or “mudding out” crops in the fall on fields destined for rolling next spring.
- The soil surface needs to be firm enough to deliver an effective crimping force against the soil surface. Crimp with sufficient residual spring soil moisture, but not when fields are wet enough to cause compaction. (Designs using weighted gangs of smaller rollers to track uneven field surfaces used in Latin America may become available in the future according to Sjoerd Duiker at Penn State.)
- Combine crimping with non-selective burndown herbicide at termination.
- If rear-mounted, driving in reverse results in even termination. Avoid operator neck strain. If driving in forward, the operator can stagger wheel tracks and make multiple passes. Because cover crops must be rolled in one direction parallel to planting, travel time, fuel consumption, compaction and labor will increase.

Problem 2: Unacceptable weed pressure penetrates mat, no rescue control options

- Long season crops can be lost to poor weed suppression, especially competitive summer annuals like Jimson weed, ragweed, morning glory, hairy Galinsoga, pigweed and grasses.



Solutions: Seed cereal rye cover crop at 2-2½ bu/a in early Sept, spot treat herbicides

- Seed at high rates early in the fall. Treat the cover crop like a cash crop by growing the largest biomass and terminating it at the best time.
- Trials indicate seeding rye at rates above 2½ to 3 bu/a do not increase biomass, but do increase weed suppression. About 5,000 lb. of above ground cover crop residue is the minimum required to suppress weeds. The USDA-ARS Beltsville suggests 7,000 - 8,000 lb/a residue, higher as you move geographically south.



Dense rye cover crop stand at 33 days after seeding 2½ bu/a



Ragweed penetrating insufficient rolled cover crop residue seeded 1 bu/a

In roller crimper no-till tomato, smooth pigweed and ivyleaf morning glory penetrated a thick rye mat, requiring additional 41-hr/a hand weeding.



- Avoid wheat; wheat straw residues are less durable and decompose more quickly than rye.
- Prevent winter cover crop damage from wildlife like geese or deer.
- Top dress in March with 30-40 lb/a N fertilizer.
- Use non-selective burndown herbicides, Glyphosate or Gramoxone shielded at max 30 psi plus nonionic surfactant. Labeled selective post-emergence grass herbicides can be used.
- Success with OMRI approved organic non-selective herbicide treatments depends on controlling weeds when they are very small (< 4 leaves) with high spray coverage (70-100 gal/a water). There are no OMRI approved products that aid terminating mature rye (Personal Comm., Bill Curran, Penn State). The following organic herbicides do not translocate, less effective for desiccation, and expensive when applied at sufficient coverage:

- Acetic acid (vinegar) concentrated solutions > 15%
- Ammonia fatty acids (Pelargonic acid, Scythe is not OMRI approved)
- Citric acids (24%) + clove oil (8%), e.g., BurnOut II
- Clove oil concentrates, e.g., Matratec, Matran
- d-Limonene citrus oil solutions, e.g., Avenger AG or GreenMatch EX
- d-Limonene + castor oil, e.g., GreenMatch

Problem 3: Ideal May termination dates delay planting early crops

- Early cover crop termination does not yield sufficient residue to suppress weeds. It is a weakness of roller crimpers that termination conflicts with early planting. There is additional delay after crimping to allow desiccation before planting.
- Results from S. Mirsky at USDA-ARS indicates the ideal time to roller crimp cereal rye is when it reaches ~50 to 75 percent flowering (anthers visible throughout the heads). Ted Kornecki of USDA waits until the 'early milk' or 'soft dough' stages of grain head fill to provide the maximum rye residue and ease of rolling. At this stage, rye attains its highest durable straw residue and crimping consistently kills the cover crop before viable seed are produced. Findings were consistent for multiple rye varieties, and ideal maturity stage for rolling did not change based on when in the fall rye was seeded or when in the spring it was rolled.

Solutions: Do not use a roller crimper if making money depends on early maturity

- Do not use no-till if marketing the crop depends on early planting and early maturity. Roller crimper no-till is for main season crops. Candidates include main season corn and soybean, main season sweet corn, pumpkin, winter squash, and late tomato, where the rolled mat reduces fruit contact with soil.
- Speed termination with a burndown herbicide application

Problem 4: Rolled cover sufficiently dense to suppress weeds fouls no-till planters

- Plug transplanter opener shoes can bind when pulled through cover crop mats, especially multi-row gangs on toolbars, resulting in repeated down time.
- No-till seeding or mechanical transplanting vegetables like pumpkin, squash, or tomato through cover crop residue opens a band of soil exposed to weed emergence.



Solutions: Desiccate cover crop, hand plant, adjust planter and use large transplants Lodged rye did not roller crimp parallel

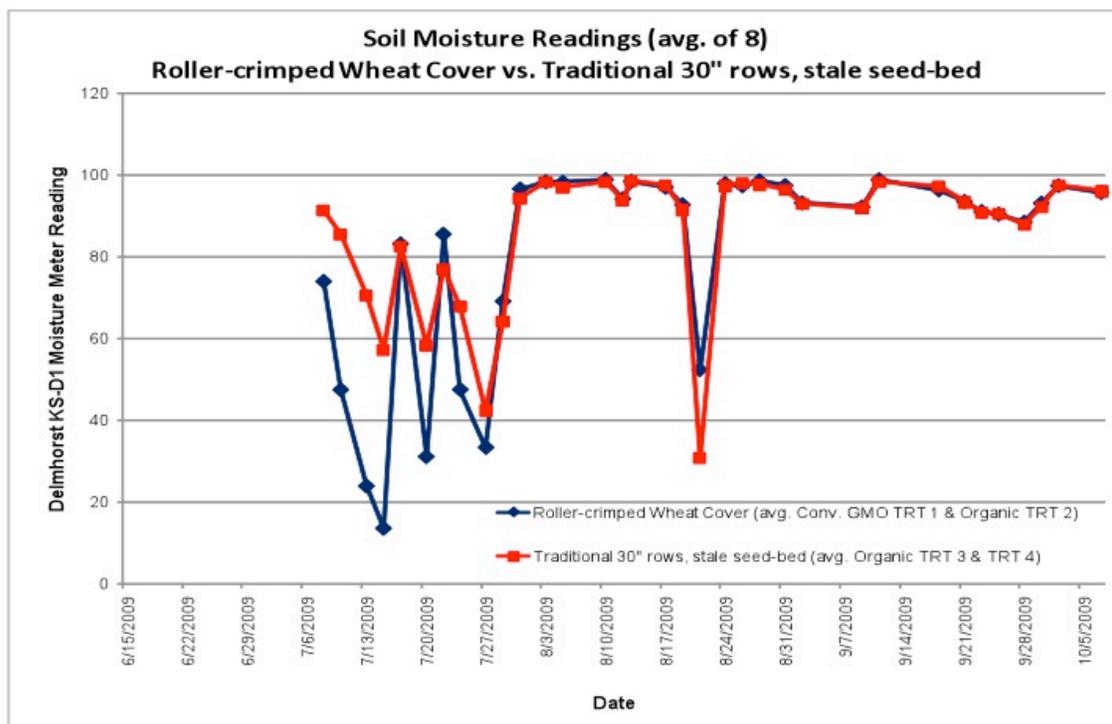
- Roll cover crop in parallel swaths before lodging to minimize binding at planting.
- Delay planting 1-2 weeks or use burndown herbicide at termination to desiccate cover crops.
- Hand transplant or seed smaller fields.
- Plug planters can be adapted to direct seeding pumpkin or squash by dropping seeds through the carousel cups into opened furrow. RJ Equipment of Ontario and Mechanical Transplanter of MI manufacture no-till carousel plug planters.
- With careful adjustment, large sharp coulter blades, and double opener coulters in front of the shoe planters will successfully move through cover crop mats.

Problem 5: Temporary moisture competition from the terminated cover crop

- Planting a crop immediately into crimped green residues, recommended by some advisors, is less successful. In dry seasons, reduced early root zone soil moisture competes with establishment. Later in summer, the mat has an opposite effect; conserving root zone soil moisture.
- Two to three weeks between termination and planting may be needed to eliminate soil moisture competition during critical stand establishment. The chart below shows evapo-transpiration soil moisture loss continued for three weeks in a NJ soybean field (2009) planted into terminated wheat cover crop (blue line) compared to bare soil (red line).

Solutions: Delay planting, drip irrigate transplants, apply burndown herbicide

- Use a broadcast burndown herbicide application just before or after rolling to hasten quickly desiccation of terminated cover crops. The seeding delay waiting for desiccation can be reduced from 2-3 weeks to 1 week.
- Irrigate newly seeded crops when necessary.



Problem 6: Escaped vetch becomes volunteer weed from rye-vetch seed mixtures

- Rye-vetch cover crop mixtures are an established practice to improve soil and nitrogen fertility. Crimping doesn't reliably kill vetch and date may conflict with viable seed production. Most regions report vetch matures about two weeks after rye, and does not set seed when rye is terminated at 50-75% flowering. This should avoid problems with vetch seedlings becoming weeds and competing with current and future crops.



Solutions: Adjust for vetch in seed mixtures, use burndown herbicide

- It is better to deal with volunteer rye than vetch. Set the rolling date based on vetch maturity instead of rye, or roll twice about two weeks apart.
- Since vetch will regrow if terminated early with rye, substitute later maturing triticale for rye as it has a similar maturity to vetch and can be terminated at the same time.
- Spot treat vetch that escaped termination or apply burndown herbicide before or after rolling to kill vetch.
- Don't use vetch cover crops on fields destined for rolling.