REDUCED-TILLAGE ORGANIC AGRICULTURE - Anu and Brian

- Brian’s work on Cornell Organic Cropping Systems experiment
  One of the treatments is a ridge-till system (ridges were formed with a potato hiller). The idea of this system is to control weeds without needing to use a moldboard plow, and to avoid soil compaction. The ridges were planted with corn and then oversown with vetch at the end of the season. In the spring, the vetch grew wildly (reaching exponential growth rate of 30%/week) and covered the remaining corn stalks. In early June, they mowed the vetch down, then scraped the ridges with the Sukup unit (an implement that is no longer made). Found that vetch which was run over by tractor tires was killed. The scraped ridges were then planted with cabbage.

Do any of the participants have no-till experience?
- John is experimenting with no-till in his hoophouse
  He made a homemade crimper to kill the fall-seeded vetch and rye in the spring at 10% flower. Found that at this stage, this wasn’t enough to kill it, and the rye tillered. Also, this method kept the soil cool and moist and so the tomatoes weren’t happy. Crimping when the rye was at full flower worked much better, and they put plastic over it and transplanted tomatoes right through the plastic and residue.

- David – why do organic and no-till seem to be mutually exclusive?
  Has heard that 2 out of 5 years you can get away with it, but then the weeds will eat you for lunch.

- Caragh’s no-till experiment
  Very weedy field - ½ of it was in crimson clover and the other half was crimson and rye. Knocked down the covers with a sickle bar and seeded pumpkins and sweet corn into it. The crabgrass got huge, and it was all a big mess. Learned good lessons though.

Major concern of no-till in this climate is that soil stays cool and moist longer.

- Anu – another Cornell experiment in reduced tillage with corn and beans
  3 tillage treatments (zone till, strip till, conventional till), and 3 weeding treatments (full herbicide, banding and strip cultivation, and cultivation only). Are actually working into organic no-till in this system over the course of multiple years by reducing herbicide use.

OSU video – high-residue systems for weed suppression and build-up of soil quality.
-Ideal cover crop is moderately priced, easily established, highly productive, easily killed mechanically, not allelopathic to the cash crop.

- Good cover crop combos:
  -Rye-vetch is a good precursor to fruit crops like toms, peppers, etc.
  -Crimson clover and barley – can use this for you earlier summer crops
  -Sudex – planted in strips with sunhemp (leguminous – Crotolaria) next to it. Sunhemp is expensive; a replacement could be cowpea.
- Winter-killed cover crops allow the possibility of no-till planting of very early spring crops. Can plant a really tender fast-growing heat-loving crop in the middle of summer, or black oats or purple vetch later in the summer – either will winter-kill fully.
- Compatibility – cover crop residues will affect the following cash crop in many ways – allelopathy, microbiology, soil moisture and temp, etc.

- **General no-till cover crop tips:**
  Often, you need to lightly till (to 3” or so) in order to get a good cover crop stand. Need to have very well-drained fields if you’re trying no-till. If you need earliness (or live in the northern US or Canada), use black plastic or strip/zone tillage instead. Best to roll-kill a cover crop after it’s flowered but before it has set seed.