Rye as a Cover Crop Prior to No-till Organic Soybeans in MN

The concept:
* Plant rye in fall after small grains or corn, silage corn harvest.
* No-till drill soybeans into standing rye the next spring.
* If necessary, mow/shred rye after soybeans have emerged.

Rye planting date and seeding rate:
* Late August – Early September for best fall biomass production @ 1.0 to 1.5 bu/ac
* Late September – October @ 1.5 to 2.5 bu/ac

Rye variety:
* Apparently doesn’t make much difference, but use good quality seed.
* Adapted varieties include Rymin, Prima, Homil21.

Rye planting method:
* Depending on field situation, can be no-tilled (if smooth field with minor weed issues)
* Drilling ensures best seed-to-soil contact, and thus early stand establishment
* Broadcasting and light harrowing also works (use slightly higher seeding rate)

Rye seeding depth:
* Rye is very forgiving. Plant deep (up to 2”) into moisture if necessary.

Fertility:
* If desired, manure can be applied prior to planting rye. The rye will ‘scavenge’ the nutrients.

Soybean planting date:
* After mid-May through mid- to late-June (if rain delayed).
* About the time you would normally plant soybean, or perhaps slightly later.
* Be patient, don’t “mud them in.”

Soybean seeding rate:
* 180,000 to 400,000 seed/ac – wide range, but read why below.
* Because of the rye & rye residue management, increase seeding rate slightly above normal.
* With appropriate varieties, the higher seeding rates (400,000 seeds/ac) can give great results.
  (especially if late planted)

Soybean variety:
* Avoid small seeded varieties or varieties that are known to have poorer early vigor.
* Varieties that have worked well in the past include Vintons, Atwood and Norpro.

Soybean planting method:
* No-till drill the soybeans at ≤ 7.5” row width for best results.
  (otherwise you give up yield and weed control because of slow canopy closure)
* Consider cross-seeding (planting in two-directions). This does two things: 1) gives a good
  spatial distribution of the soybean plants for better canopy closure, and 2) can adequately
  control/shred the rye by laying down the rye on the first pass and cutting it up on the
  second pass.

Soybean seeding depth:
* Use a good no-till drill: be sure the seed gets in the ground.
* It is desirable to have adequate seed-furrow closure.
Rye mowing/shredding date:
* Wait until the rye has headed (which is somewhat temperature dependent). [~early June]
* Best when pollen shed is or has occurred – waiting to pollen shed ensures less rye regrowth.
* Typically this will be during early- to mid-June, and the soybeans will be at the first or second visible trifoliate growth stage.

Rye mowing/shredding method:
* Shred rye as low to the ground as possible (to ensure less rye regrowth),
  but above the height of the soybeans.
* Shred at heading, and ideally after pollen shed.
* Can use a flail mower, a sickle mower, or a rotary mower,
  but avoid creating windrows with the rye residue.
* This step can be avoided if the soybean is cross-seeded in two directions.

Harvesting the soybean:
* Don’t be surprised that there will be rye seed in the soybean seed harvested.
  (This rye can be cleaned out, and sold for feed.)

Do’s:
* Have the proper equipment for seeding the soybeans and mowing/shredding the rye.
* Timely field operations are essential.
* Plant rye early in the fall and at an adequate seeding rate for best weed control.
* Talk with producers who have done this successfully.
* Be patient (and adaptive). The first time you try this you will think it is crazy.

Don'ts:
* Skimp on rye and soybean seed / quality.
* Mow/shred the rye too early.
* Think the system won’t work – it does work (see the ‘Do’s)

Problems / Issues:
* Poor rye stand obvious in early spring -
  -- consider turning under the rye, but do this before rye stem elongation.
  (if the rye is turned under, plant soybeans on wide rows and cultivate)
* Planted rye late in the fall and there is little early spring growth / biomass -
  -- if weed pressure is light and rye stand is good, be patient, the rye will grow.
  -- if weed pressure is heavy, consider turning under the rye before stem elongation.
* Wet conditions delays soybean planting until mid- to late-June -
  -- plant anyway, especially if you have the proper short season soybean variety.
* Wet conditions delays rye mowing/shredding and soybeans are tall and spindly -
  -- mow/shred when you can, the soybeans will be OK.
* Dry conditions and the soybeans haven’t yet been planted -
  -- hold up planting soybeans until you get some soil moisture to ensure good seed placement. Hope rain comes. Mow/shred rye after pollen shed.
Rye as a Cover Crop Prior to Organic Soybeans – NW MN

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Provided by Dr. Paul Porter (pporter@umn.edu) at the NPSAS Summer Tour, 2005