Success With Cover Crops

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Why Cover Crops?

- Reducing erosion
- Improving soil quality
- Minimizing nutrient loss
- Improving water quality
- Increasing water infiltration
- Reducing weed populations
- Supplying nitrogen from legumes
Maximize Biomass

- Maintain soil fertility and pH
- Plant quality seed
- Establish a good stand
- Inoculate legume seeds - specific & fresh
- Plant early
- Terminate late
Selection of Cover Crops

- What is your cash crop?
- What are your desired benefits?
- What are your growing conditions?
- What is your experience level?
Selection of Cover Crops

What is your cash crop?

- Peanuts or soybeans: any small grain
- Corn: rye or triticale or legume
- Cotton: any small grain or legume
- Vegetables: rye, triticale, millets, legumes
Selection of Cover Crops

- What are your desired benefits?
  - Nitrogen
    - Crimson clover or hairy vetch
  - Reducing weed pressure
    - Rye/black oats > triticale
    > wheat

Annual rye - note heavy residue and no weeds
Selection of Cover Crops

• What are your desired benefits?
  - Erosion control
    • Anything with >70% cover
  - Minimizing nutrient loss
    • Deep-rooted covers (rye)
  - Improving soil and water quality
    • Cover crops in general
Selection of Cover Crops

• What are your field conditions?
  - Wet soils
  - pH
  - Sandy vs clay
  - Winter temperatures
Selection of Cover Crops

• What is your experience level?

→ None = wheat

→ Some = rye

→ Lots = clover or mixtures
Planting Cover Crops

- Planting dates
- Planting method
- Seeding rates
- Pest control
Planting Cover Crops

- **Planting Date**
  - Fall planting of cover
    - Cool season small grains and legumes
  - Spring and Summer
    - Warm season grasses and legumes

Rye planted: Nov. vs Oct.
Planting Cover Crops

• Planting methods
  - Drill or direct seeding preferred
  - Broadcast
    • Prior to peanut harvest
    • Prior to cotton defoliation
    • Broadcast and harrowing, careful of depth

• Tillage
  - Avoid soil compaction - wet soil
  - Deep tillage (paraplow or subsoil shank) improves biomass production
Planting Cover Crops

- **Seeding rate**
  - Drilling takes less seed than broadcasting.

- **Seeding depth**
  - Grasses and large seeded legumes should be planted 1 to 1.5 inches deep.
  - Plant smaller seed 0.25 to 0.5 inches deep.

<table>
<thead>
<tr>
<th>Cover</th>
<th>Drilling (7.5&quot;)</th>
<th>Broadcasting</th>
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</thead>
<tbody>
<tr>
<td>Small grains</td>
<td></td>
<td></td>
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<tr>
<td>Wheat</td>
<td>15 to 18</td>
<td>40 to 45</td>
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<tr>
<td>Oats</td>
<td>12 to 15</td>
<td>25 to 30</td>
</tr>
<tr>
<td>Triticale</td>
<td>15 to 18</td>
<td>40 to 45</td>
</tr>
<tr>
<td>Rye</td>
<td>18 to 22</td>
<td>45 to 50</td>
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<tr>
<td>Legumes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crimson clover</td>
<td>12 to 15</td>
<td>20 to 30</td>
</tr>
<tr>
<td>Hairy vetch</td>
<td>15 to 20</td>
<td>25 to 35</td>
</tr>
<tr>
<td>Grasses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Millet</td>
<td>8-10</td>
<td>20</td>
</tr>
<tr>
<td>Sorghum-sudan</td>
<td>15-20</td>
<td>30</td>
</tr>
<tr>
<td>Legumes</td>
<td></td>
<td></td>
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<tr>
<td>Velvet beans</td>
<td>60</td>
<td>120</td>
</tr>
<tr>
<td>Cowpeas</td>
<td>30 to 40</td>
<td>60 to 70</td>
</tr>
</tbody>
</table>
Planting Legume Cover Crops

- Seed treatments for legumes
  - Inoculants

Note nodules on roots
Pest Control in Cover Crops

- Herbicides
  - May need to control weeds
  - Carry-over from previous crop
- Insects
  - Hessian fly and aphids
- Seed treatments for small grains
  - Fungicides
Cover Crop Fertility

- Small grains and summer grasses
  - Need nitrogen
- Cool season and summer legumes
  - Fix nitrogen
Fertility

• Small Grains
  - Add N to get more biomass production
    • Fall applications of N if cover is for corn
    • Winter applications of N if cover is for cotton, peanuts, soybeans or grain sorghum

• Legumes
  - Proper inoculant will produce 50 to 100 lbs N
Terminating Cover Crops

- **Timing**

![Diagram showing the stages of plant growth and their correlation with biomass and decomposition]

- Low biomass, quick decomposition
- High biomass, slow decomposition

*Conservation Tillage Systems Series*
**Cover Crop Decomposition**

- C:N ratio > 25-30 results in nitrogen immobilization
- Cover crops and C:N ratio
  - Small grains have high C:N ratio
  - Mature, older crops have high C:N ratio
  - Legumes have low C:N ratio
  - Succulent, young crops have low C:N ratio
Small Grain Termination

- Late termination for higher weed suppression
- Terminate three weeks before planting to reduce
  - Soil moisture depletion
  - Insect pressure

Note weed suppression in cotton
Legume Termination

- Minimize time between cover crop termination and planting the following crop to maximize N recovery
- Manage to allow reseeding
  - Strip termination

Note reseeded crimson clover
Terminating Cover Crops

- Termination method
  - Burn-down herbicides

Anybody got a picture of roundup being applied?
Terminating Cover Crops

- Termination method
  - Roller-crimpers

Conservation Tillage Systems Series
Cover Cropping Summary

- Cover cropping provides environmental, production, and economic benefits
- Maximum benefits come from maximum biomass
- Cover cropping needs to be managed carefully to provide desired benefits
Cover Crop Resources

- Cover crops at UGA -
  http://www.caes.uga.edu/commodities/sustainag/contillage/index.html

- Managing Cover Crops Profitably, 2nd ed. Sustainable Agriculture Network.
  www.sare.org/publications/covercrops/covercrops.pdf

- Sustainable Practices for Vegetable Production in the South
  www.cals.ncsu.edu/sustainable/peet/index.html

- National Sustainable Agriculture Information Service (ATTRA)
  www.attra.org
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