THE UNIVERSITY OF GEORGIA
COOPERATIVE EXTENSION
Colleges of Agricultural and Environmental Sciences & Family and Consumer Sciences

USDA NRCS

USDA ARS

Success With Cover Crops

Contributing Authors:
Dr. Dewey Lee, University of Georgia
Ms. Julia Gaskin, University of Georgia
Dr. Harry Schomberg, Agricultural Research Service
Dr. Gary Hawkins, University of Georgia
Dr. Glen Harris, University of Georgia
Dr. Barbara Bellows

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

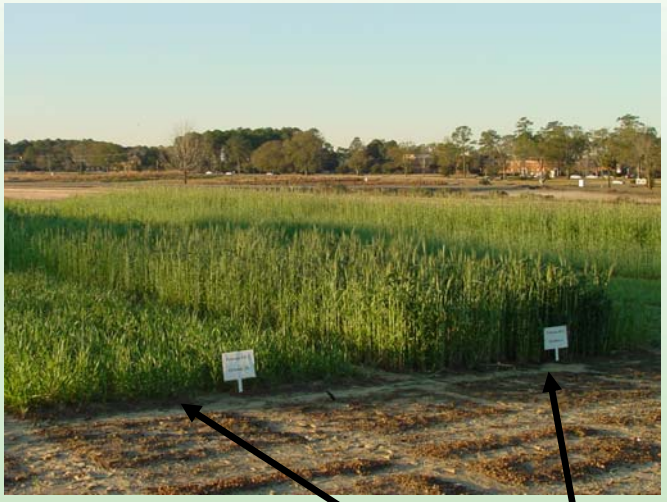
→ Lots = clover or mixtures

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.

Cover	Drilling (7.5”)	Broadcasting
Small grains	**Seeds Per row ft**	**Seeds per Sq. ft.**
Wheat	15 to 18	40 to 45
Oats	12 to 15	25 to 30
Triticale	15 to 18	40 to 45
Rye	18 to 22	45 to 50
Legumes	**Lbs per acre**	**Lbs per acre**
Crimson clover	12 to 15	20 to 30
Hairy vetch	15 to 20	25 to 35
Grasses		
Millet	8-10	20
Sorghum-sudan	15-20	30
Legumes		
Velvet beans	60	120
Cowpeas	30 to 40	60 to 70

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

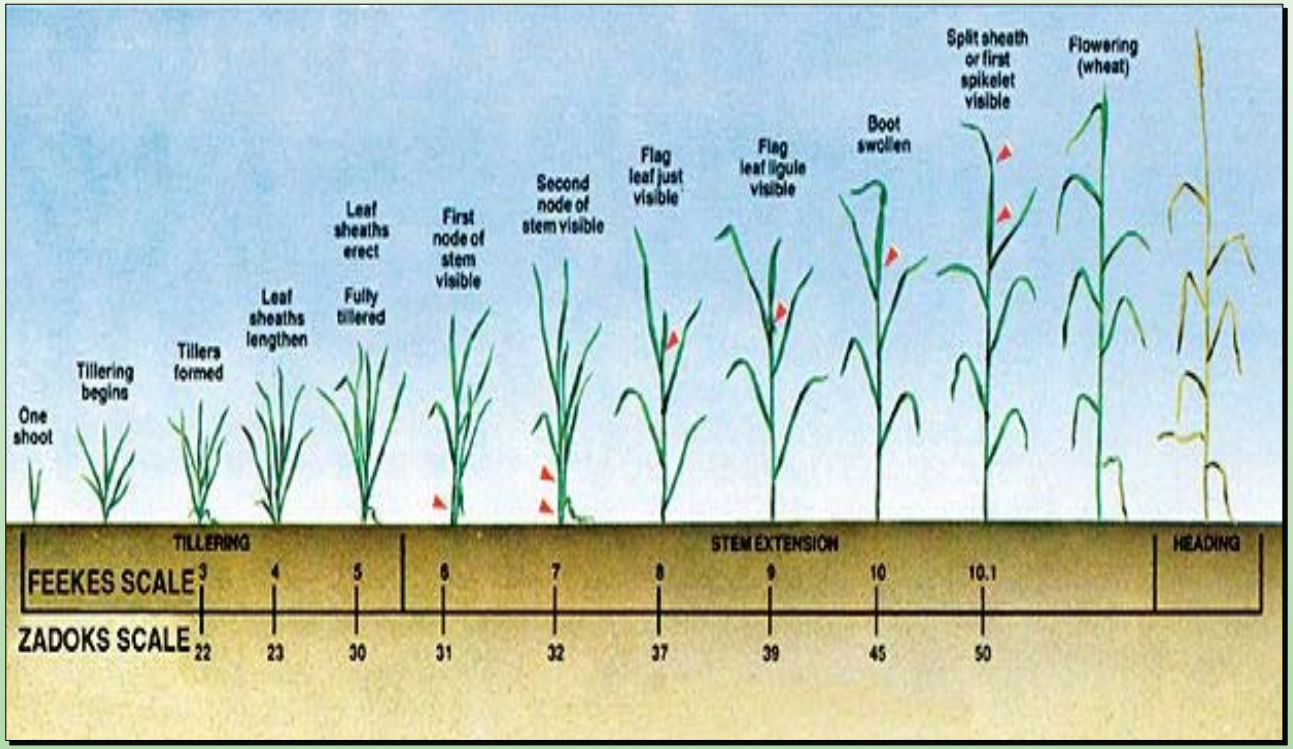
- Small grains and summer grasses
  - Need nitrogen
- Cool season and summer legumes
  - Fix nitrogen

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



Low biomass, quick decomposition

High biomass, slow decomposition

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

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

Information in this presentation was developed through a cooperative effort between: