Small Farm Conference

How to Manage Cover Cropping for Small Producers

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SOUTHERN SARE Sustainable Agriculture Research & Education

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Benefits of cover crops

- Erosion (wind and water)
- Soil organic matter
- Nutrient capture and recycling
- Nitrogen fixation (energy use)
- Soil water holding capacity
- Soil compaction
- Suppress weeds
- Increase Biodiversity
- Additional expenses

Potential challenges

- Timing of kill and land preparation (may delay planting)
- Incorporation (cover crop, equipment)
- Nitrogen tied-up and slow release (grasses)
- Weeds if poor stand
- Used up soil moisture
- Cool soil in spring
- May provide habitats for pests

Selection and mixtures

- Objective(s) and season
  - Nitrogen (legumes)
  - Nutrient capture/recycle (grasses, brassicas, others)
  - Organic matter (grasses)
  - Bio-fumigant (brassicas)
  - Erosion (all)
  - Weed suppression (grasses, legumes)
  - Etc.

Legumes (nitrogen fixers)

- Winter/early spring
  - Red/white clovers
  - Vetch
- Summer
  - Peas
  - Sunn hemp
  - Beans
  - Lablab
- Nitrogen fixing:
  - 50-250 lb/acre
- Not good N-scavengers
- Biomass:
  - 1 to 3 tons/acre
- Erosion

Winter: red clover

Winter: vetch

Summer: Sunn hemp

Summer: cowpea

Grasses (biomass, scavenge)

- Winter
  - Rye
  - Wheat
  - Barley
  - Others
- Summer
  - Sorghum Sudan grass
  - Millet
- Good scavengers
- Biomass:
  - 1 to 5 ton/acre
- Weed suppression
- Erosion

Winter: Rye

Winter: wheat

Summer: sorghum sudan

Summer: millet

Brassicas (soil health)

- Winter
  - Canola
  - Mustard
  - Radish
  - Turnip
  - Others
- Good scavengers
- Natural fumigants
- Hard pan
- Erosion

Brassicas: mustard

Brassicas: rape

Brassicas: radish

Mixtures

Field preparation

- Same as your cash crop, but could be less intensive
- Good seed-to-soil contact
- Disc-harrow and roller/cultipacker
- Soil moisture

Sowing

- Drill/drop vs rotary spreader
  - Different seed weight fly different distances

Crop stand

- Drill sowing vs rotary spreader

Residual nutrients

- Scavenging/recycling nutrient
- Fertilize for biomass

Growth and time to kill

- Any time, but optimal biomass at flowering

Kill

- Rolled/crimped with/without herbicide for conservational tillage
- Herbicides to complete weed control
- Slow release of nutrients

Kill

- Undercutting
- Knife cultivator

No-till planting

- No-till planter (coulter and shank)

No till planting

- Irrigation
- Slow growth


Shredding

- Speed up degradation and nutrient release
- Facilitate incorporation
- Flail mower (flat and bed shape)
- Rotary mower (short cover crops)
- Weed eater



Rotary mower (bushhog)

- Uneven
- Side drop


Row contour flail mower

- Potato/sweetpotato vine shredder


Flat flail mower



Incorporation

- With/without shredding
  - Spader
  - Plow
  - Disc harrow



Incorporation

- Rototill (shred and incorporate)
  - Biofumigation
  - Speed up decomposition and nutrient release


Rototill

Shred, incorporate (rototill), and plastic mulch




Plasticulture and nutrients

Shredding and plastic mulch

Subsequent cash crop

- Grasses (sorghum) tie-up nutrients
- Legumes promote growth

Questions?

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