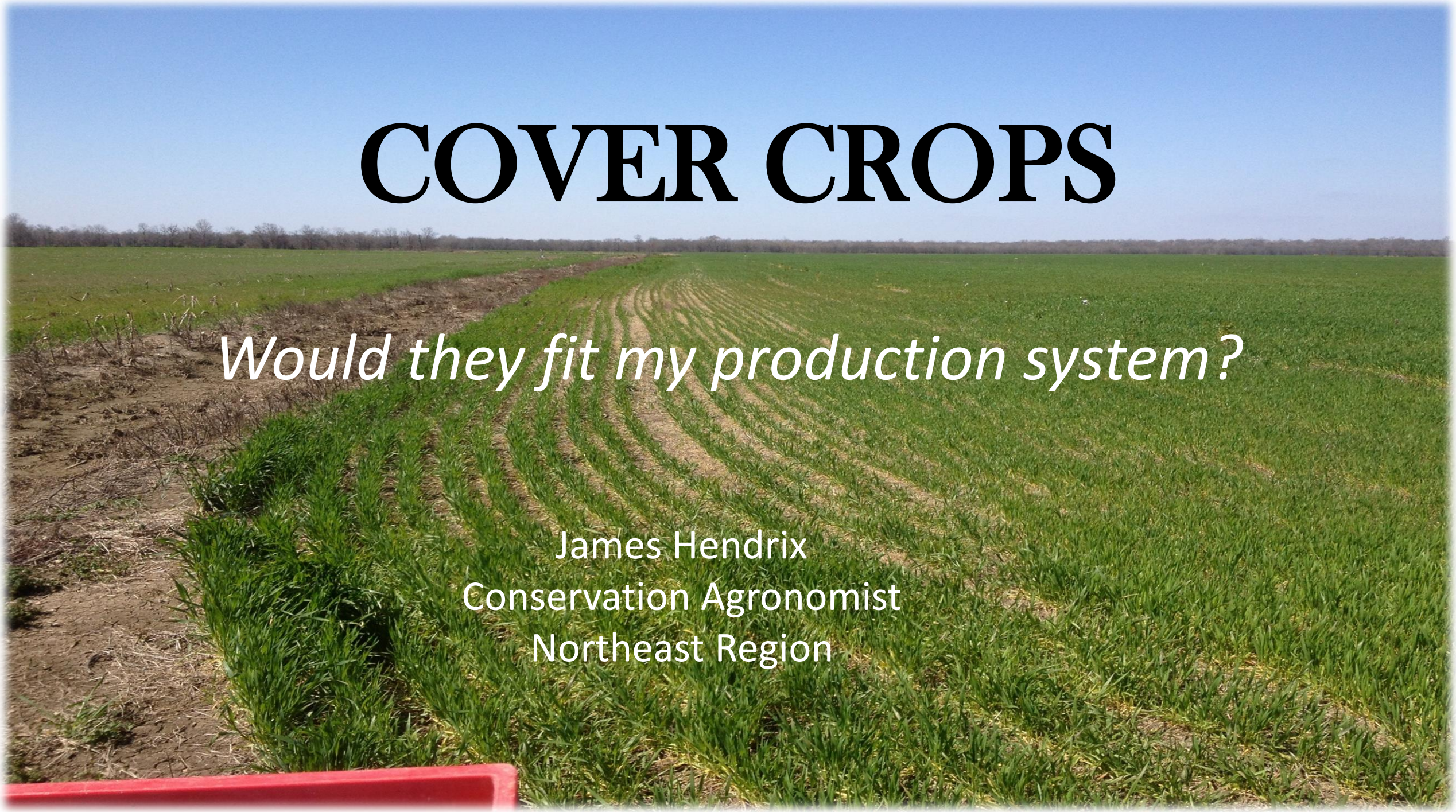


COVER CROPS

Would they fit my production system?

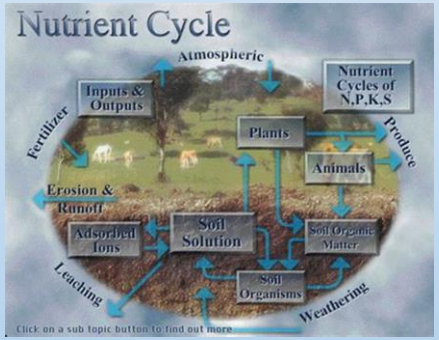
James Hendrix
Conservation Agronomist
Northeast Region

MAYBE SO

OR

MAYBE NOT

Several reasons you may decide to integrate cover cropping in your production system

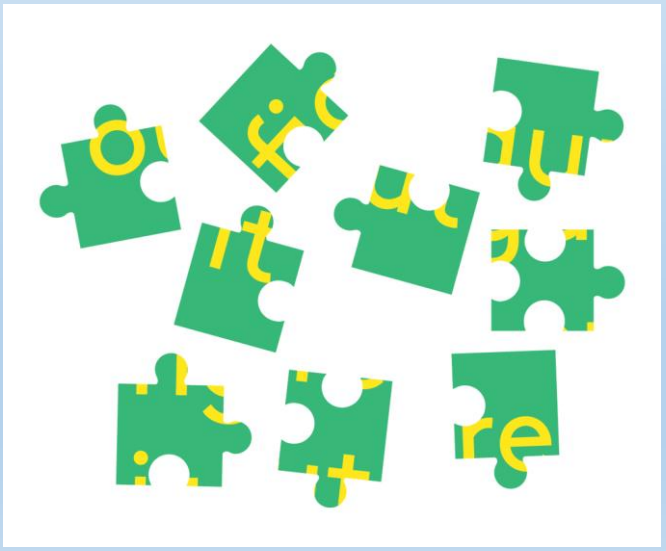


Are covers the possible solution to all of these problems on the farm?

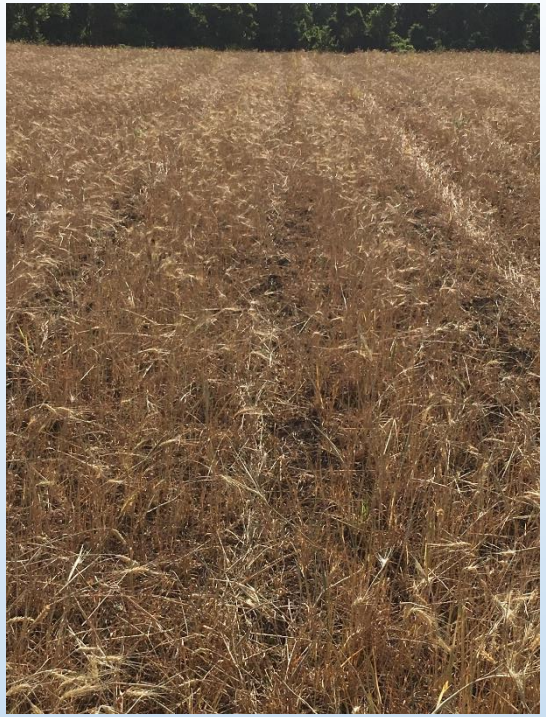
No, but they can be a beneficial production management tool to help solve issues if properly selected and managed.

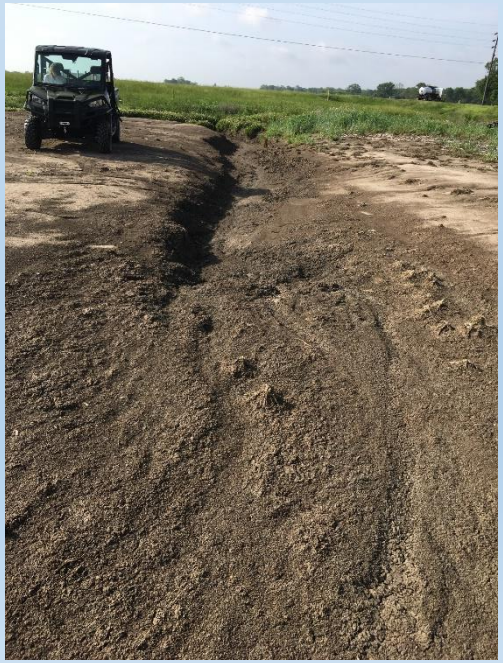

Issues
erosion, weeds, fertility, compaction,
water management, insects, diseases


Resources,options



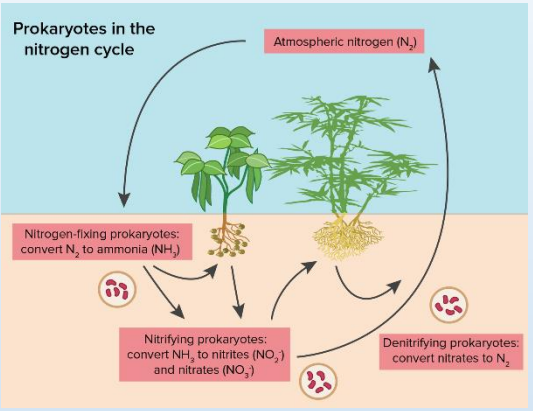
Erosion Control



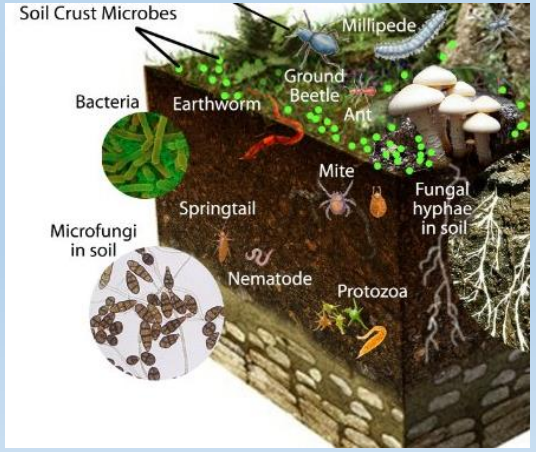


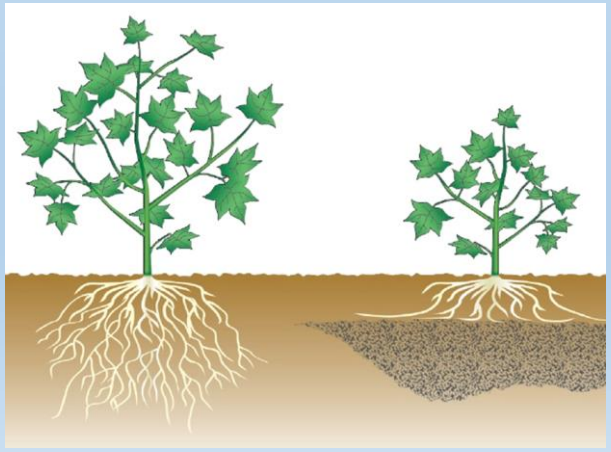
Weed Suppression

Improved Nutrient Cycling and Use Efficiency



- Nitrogen producers
- Nitrogen/nutrient Scavengers
- Serve as sub-soilers to break up compacted soil over time
- Help build organic matter and sequester carbon
- Provide food for microorganisms that stabilize soil aggregates
- Increased soil permeability and soil aeration
- Reduce nutrient leaching and transport off-site





A general expectation of planting the cover crops over time is to ……..

Improve soil quality, or how well a soil can perform *what we want it to do*. Influencers affecting soil function improvement are:

- **Biological factors**
- **Organic matter**

With a goal of …….

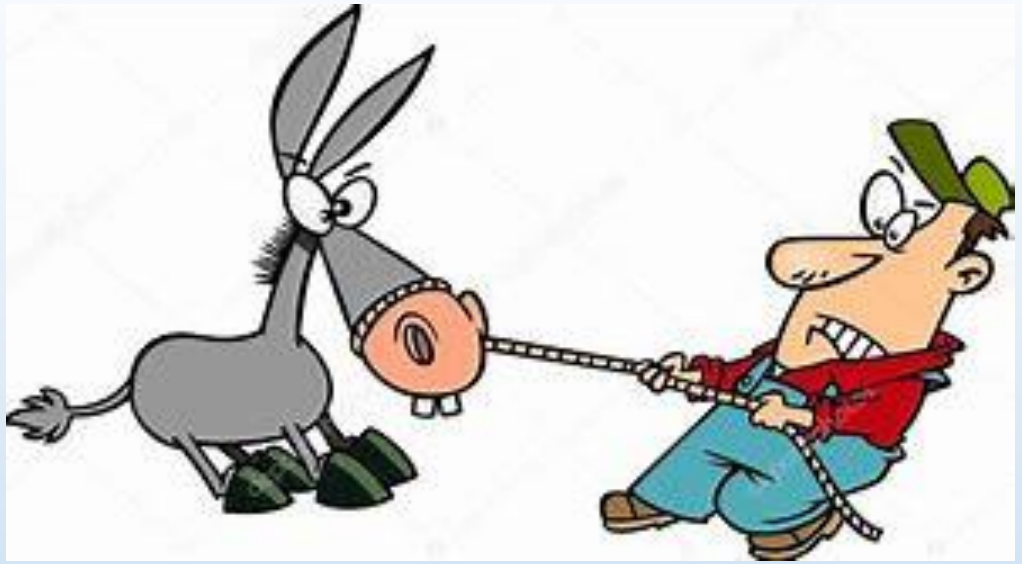
- Improving yields
- Increase economic returns
- Improve crop quality
- Reducing nutrient loss vial leaching or erosion

The ultimate expectation of planting cover crops over time is to ……..

Enhance soil health or the *state of a soil meeting its range of ecosystem functions as appropriate to its environment.*

- **Maintenance or improved biodiversity**
- **Water quality**
- **Nutrient cycling**
- **Biomass production**

ISSUES



- Costs associated with seed, equipment and planting
- Timing of planting due to harvest of cash crops
- Can immobilize nitrogen for following cash crop
- Disease and insect problems due to green bridge
- Cooler and slower drying of soil
- Excess moisture post termination
- Allelopathy
- Incorporation with equipment difficult


SALFORD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HIPPER CHOPPER

In some cases, producers have opted to utilize crop rotations in lieu of cover crops, but most Louisiana producers rotate anyway.

- Utilization of crop rotations can increase opportunities and maximize benefits for planting cover crops.

IF YOU DECIDE TO INTEGRATE COVER CROPS IN YOUR PRODUCTION SYSTEM

Start small on manageable acreage

Small, irregular fields prone to erosion, nitrogen leaching, etc.

Selecting species:

- Your current and subsequent crop
- Best suited for your goals
- Adapted to your region and soils
- Adapted to your tillage system
- How will it be planted and terminated
- Have fast is germination and emergence (competitive)
- Are easily terminated at recommended time
- Manageable residue based on your resources
- Most beneficial to soil fertility
- Economical

Mono-species or Multi-species?

- You can find research to support both
- Your decision based on your operation
- May be best starting simple with 1 or 2 species
- Don’t expect a silver bullet that will fix everything you think it should !!

Species	Nitrogen Source	Weed Suppression	Erosion Control	Subsoiler	Quick Growth	Forage	N Scavenger	Residue Persist.	Insect Nemat. Issues	Crop Disease	Allelop.
Hairy Vetch	E	G	G	G	F	G	F	F	MIN	NO	G
Crimson Clover	E	VG	VG	F	G	E	G	G	YES	MIN	F
Subt. Clover	E	E	VG	P	G	VG	F	VG	YES	MIN	VG
Red Clover	E	VG	G	VG	F	E	G	F	MOD	MIN	G
Berseem Clover	E	E	VG	F	E	E	VG	G	MIN	MIN	F
Winter Peas	E	G	VG	F	VG	VG	F	F	MIN	MOD	F
Oats		E	VG	P	E	G	VG	G	MIN	MIN	VG
Rye		E	E	F	E	G	E	E	MIN	MIN	E
Wheat		VG	VG	G	VG	VG	VG	VG	MOD	MOD	F
Radish		E	VG	E	VG	G	E	F	MIN	NO	VG
S-Sudan		VG	E	E	E	VG	E	VG	MIN	NO	E

REMEMBER….

- Legumes: Most N fixation takes place in early to late spring growth; however higher C:N ratios can result in less immediate N for following crop.
- Cereals: Nutrient uptake is most during late-tillering and around jointing.
- Brassicas: Nutrient uptake is during early season growth. Early leaf shedding indicates stress and release of N during this time can be lost to leaching.

KEEP IN MIND……

Cover crops have shifted from winter growth to spring growth.

Initiate your spring management of cover crops based on intended purpose, cover crop planted and successive crop.

- Scout your cover crops for insect pests/beneficials to maximize benefits/reduce risks.
- For the 2022 corn crop, termination should begin in early February. If a beginner, terminate cereals at less than 10-12” before corn planting.
- Soybeans and Cotton:
  - Difficult cover crops to terminate (reproductive legumes or *Brassicas*) should be terminated or in progress.
  - Cover crops that are easy to terminate (cereals and vegetative legumes) should be terminated to allow for two to four weeks of non-actively growing cover crops.


1/11/2019
2019/01/11


3/18/2019

Cover Crop Decision Tool

Naveen Adusumilli, Hendrix, James, Copes, Josh | 1/23/2019 3:53:28 PM

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COVER CROP COSTS CALCULATOR

Select dropdown values from **PURPLE** cells | Enter your input values in **YELLOW** cells; | Default values in **GREEN** cells can be used

Cover Crop Production Cost Estimator

	CC1	CC2	CC3	CC4
What cover crop do you like to use	Cereal Rye	None	None	None
Farmer preferred seeding rate, lbs/acre	20	0	0	0
Price/lb (For Research ONLY)	0.46	0.00	0.00	0.00
Price/lb; YOUR LOCAL DEALER	0.00	0.00	0.00	0.00
Planting Method (Select One)	Drill			
Planting Machinery Costs, $/acre	--	5		
Would you like to fertilize cover crops	Fertilize			
Fertilization costs, $/acre	--	5		
How would you terminate the cover crops	Mowing/Rolling			
Labor costs, $/hr	$ 10.00			
Labor Hrs	0.0			

Total Costs, $/acre

$23.34

NRCS Cover Crop and Tillage Decision Tool

Do you plan to grow single species or multiple species of cover crops (Select one)	Single
Is the Cover Crop practice you selected above an *existing practice* or a *new practice* on those fields	New
Type of Tillage you want to adopt on the fields with cover crops (select one)	Reduced Till
Is the tillage practice you selected above an *existing practice* or a *new practice* on those fields	New

NRCS Incentive Payment; $/acre/year

$66.00

Net cost to farmer if NRCS incentives are used

$/acre

-$42.66

https://southerncovercrops.org

Apps | LSU AgCenter | Intranet | Weather | AgCenter Remote S... | LA Cover Crops CIG... | Visual Index « AQU... | att | Conservation Practi... | CPCSWeb Data Coll... | dashboards My Ext... | Degrees, Minutes, S... | Directions from St J... | DWMAPS - Drinkin...

Southern Cover Crops Council

Advocating "best cover crop practices" for the southern region of the U.S.

About SCCC | Cover Crop Information Sheets

Click the production system in which you are interested:

Row Crops

Vegetables (Coming Soon)

Grazing (Coming Soon)

For the Latest Cover Crops News,
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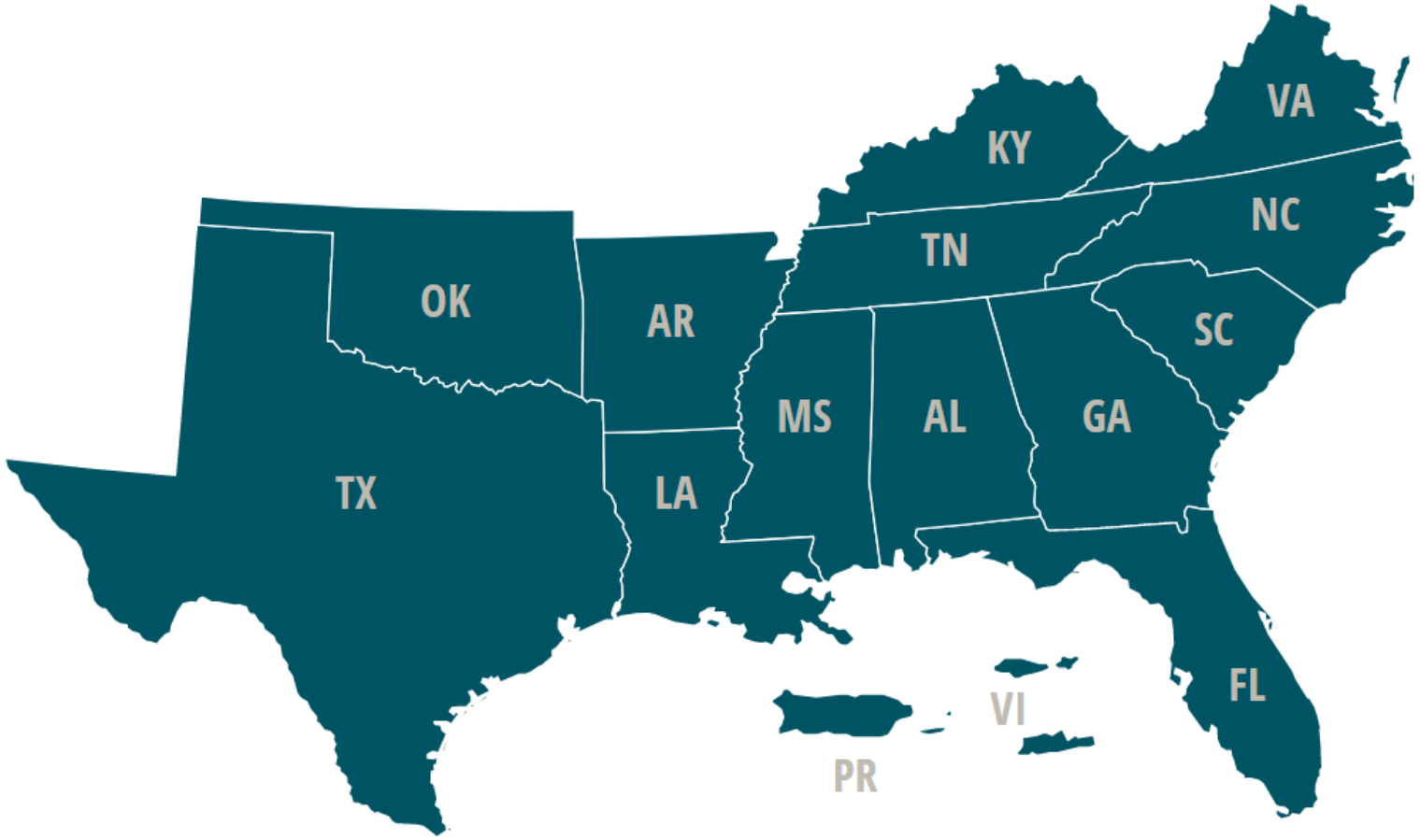
Row Crops

On the map below, hover and click to select your state and then county:



Cover Crop Information Sheets

Fall or Winter Planted Cover Crops

Small Grains

- Annual ryegrass
- Black oats
- Cereal rye
- Oats
- Triticale
- Wheat

Legumes

- Balansa clover
- Crimson clover
- Blue lupin
- White lupin
- Common vetch
- Hairy vetch
- Austrian winter peas

COASTAL PLAIN SECTION NAVIGATION

Cover Crop Selection Tool

Planting and Managing Cover Crops

Seed Sources

Terminating Cover Crops

Planting Cash Crops in Cover Crop Residue

Equipment Rental

Local Experts

Financial Assistance

Additional Resources

SOUTHERN COVER CROPS COUNCIL

Cover Crop Information Sheet

CEREAL RYE (*Secale cereale* L.)

Cereal rye is the workhorse small grain cover crop in the Coastal Plain. It produces the most biomass of the small grains. In no-till systems, it is excellent for summer weed suppression when allowed to mature due to a persistent residue.

Recommended Varieties

Variety	Reasons Why	Source
Wrens Abruzzi	Cheap, easily available, good biomass, few diseases.	
Winter Grazer	Forage variety, high biomass.	
Elbon, Maton, FL 401	Elbon is a recommended variety from Georgia Statewide Variety Trials. Maton is an older variety that has good yields in Georgia Statewide Variety Trials. Florida 401 is very early maturing variety.	Jimmy Carter Plant Materials Center data
Bates, Bates RS4, Maton II, Oklon	These varieties have similar performance in OK to those listed above.	Noble Research Institute

Planting Information

Information		Comments	Source
Drilled Seed Depth (inches)	¾ - 2		Managing Cover Crops Profitably
Drilled Seeding Rate (lbs/acre)	60 - 100	Higher rate may be needed in conservation tillage systems for sufficient biomass to suppress weeds in following cash crop.	Managing Cover Crops Profitably
Broadcast Seeding Rate (lbs/acre)	90 - 120	Rye has the highest likelihood of broadcast seeding success of any of the small grains. Broadcasting after peanut digging and before peanut harvest works well, but timing is critical to avoid rye germination before peanut harvest. Broadcasting before cotton defoliation has also worked for many farmers.	GA county agent – personal communication, Managing Cover Crops Profitably
Aerial Seeding Rate (lbs/acre)	150	Rye has the highest likelihood of aerial seeding success of any of the small grains. Very dependent on favorable weather for success.	USDA Cereal Rye Plant Guide

Termination Information

Information	Source
Cereal rye can be terminated by mowing, rolling & crimping, herbicides, tillage, high density grazing and combinations of these practices. Termination timing depends on goals. For weed suppression, cereal rye should be terminated at milk to soft dough stage. To reduce potential nitrogen immobilization, cereal rye should be terminated before flowering (antheses). When planting cash crop into cereal rye residue, wait at least two weeks after termination so that the residue is dry and crispy. Some farmers plant into green cereal rye and spray an herbicide as they plant or shortly afterward. This may increase risk of cut worm damage. Consult your local Extension and state Pest Management Handbook for herbicide recommendations. Always follow the herbicide label.	USDA Cereal Rye Plant Guide

Cultural Traits

Traits		Comments	Source
Typical Dry Matter Range (lbs/acre)	3,000 - 8,000		Managing Cover Crops Profitably (modified by research data from Coastal Plain)
Typical Total N Range (lbs/acre)	25 - 50	These values are for total N in cereal rye aboveground biomass is due to N scavenging. N in cereal rye residue is not available during following growing season. Early termination may provide a small amount of N to following cash crop. Late termination can cause N immobilization due to high C:N ratio.	Managing Cover Crops Profitably
Life Cycle	Cool season annual grain		Managing Cover Crops Profitably
Growth Habit	Upright		Managing Cover Crops Profitably
Preferred Soil pH	5.0 - 7.0	Cereal rye is more tolerant of acidic soils than oats or wheat. It is more adapted to sandy soils than other small grains.	Georgia Forages, Managing Cover Crops Profitably
Relative Costs ($/acre)	$$$		Based on survey of seed costs using maximum price and max seeding rate
Min. Germination Temp (F)	34°	Cereal rye is best choice for late planting as it grows at 5 degrees lower temperatures than other small grains.	Georgia Forages, Managing Cover Crops Profitably, Noble Research Institute

Influence of Soybean Herbicide Treatments on Fall Cover Crop Stand (2013-2015)

Mizzou weed science

No stand reduction in any year | Stand reduction in 1 of 3 years | Stand reduction in ≥2 of 3 years

Herbicide Treatment	Rate	Cover Crop Species: Winter Wheat	Tillage Radish	Cereal Rye	Crimson Clover	Winter Oat	Austrian Pea	Annual Ryegrass	Hairy Vetch
	--product/A--	-------% Stand Reduction relative to non-treated, 28 days after emergence-------							
Spartan	8 fl ozs								
Valor	2.5 ozs								
Sencor	0.5 lb								
Authority First	6.4 ozs								
Classic	1.5 ozs								
Flexstar	20 fl ozs								
Cobra	12.5 fl ozs								
Pursuit	4 fl ozs								
Firstrate	0.6 oz								
Synchrony XP	0.375 oz								
Dual II Magnum	1.33 pts								
Warrant	1.5 qts								
Zidua	3 ozs								
Prefix	2 pts								

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Influence of Soybean Herbicide Treatments on Fall Cover Crop Biomass (2013-2015)

Mizzou weed science

No biomass reduction in any year | Biomass reduction in 1 of 3 years | Biomass reduction in ≥2 of 3 years

Herbicide Treatment	Rate	Cover Crop Species: Winter Wheat	Tillage Radish	Cereal Rye	Crimson Clover	Winter Oat	Austrian Pea	Annual Ryegrass	Hairy Vetch
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Firstrate	0.6 oz								
Synchrony XP	0.375 oz								
Dual II Magnum	1.33 pts								
Warrant	1.5 qts								
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Influence of Corn Herbicide Treatments on Fall Cover Crop Stand (2013-2015)

Mizzou weed science

No stand reduction in any year | Stand reduction in 1 of 3 years | Stand reduction in ≥2 of 3 years

Herbicide Treatment	Rate	Cover Crop Species: Winter Wheat	Tillage Radish	Cereal Rye	Crimson Clover	Winter Oat	Austrian Pea	Annual Ryegrass	Hairy Vetch
	--product/A--	-------% Stand Reduction relative to non-treated, 28 days after emergence-------							
Atrazine	2 qts								
Callisto	3 fl ozs								
Laudis	3 fl ozs								
Impact	3/4 fl oz								
Balance Flexx	5 fl ozs								
Stinger	½ pt								
Python	1 oz								
Resolve	1 oz								
Accent Q	0.9 oz								
Surestart + Atra	1.75 pt + 1 qt								
Halex GT + Atra	4 pt + 1 qt								
Capreno	3 fl ozs								
Zidua	3 ozs								

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Influence of Corn Herbicide Treatments on Fall Cover Crop Biomass (2013-2015)

Mizzou weed science

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Python	1 oz								
Resolve	1 oz								
Accent Q	0.9 oz								
Surestart + Atra	1.75 pt + 1 qt								
Halex GT + Atra	4 pt + 1 qt								
Capreno	3 fl ozs								
Zidua	3 ozs								

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Conclusions

Herbicide carryover injury on cover crop species is going to vary from year to year, largely due to rainfall and time of application

The general order of sensitivity of cover crops to herbicide carryover, from greatest to least sensitive: tillage radish > Austrian winter pea > crimson clover = annual ryegrass > winter wheat = winter oats > hairy vetch = cereal rye

Soybean herbicide treatments that were most injurious to cover crops: fomesafen (Flexstar/Prefix), pyroxasulfone (Zidua), imazethapyr (Pursuit), acetochlor (Warrant), sulfentrazone (Authority products)

Corn herbicide treatments that were most injurious to cover crops: topramezone (Impact), mesotrione (Callisto, Halex GT, etc.) clopyralid (Stinger, SureStart), isoxaflutole (Balance Flexx), pyroxasulfone (Zidua, etc.), nicosulfuron (Accent Q, etc.),

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12/06/2021


12/06/2021


11/25/21


2/8/22

Rotation Cut

JHCC TERMINATION TIMING


2015/02/18


8XP
MASSEY FERGUSON