ADDITIONAL RESOURCES

To discover more about cover crops additional resources can be found at:

- www.ars.usda.gov/research
- www.mccc.msu.edu
- www.covercrops.msu.edu
- http://ryegrasscovercrop.com
- http://ifs.orst.edu
- http://ohioline.osu.edu
- www.attra.ncat.org
- http://agguide.agronomy.psu.edu
- A new edition of the SARE Managing Cover Crops Profitably book is available as an online pdf version at no charge at:

http://sare.org/publications/covercrops.htm

- Crop Consultant
- Soil and Water Conservation District
- Natural Resources Conservation Service
- Your local Extension Office
- A local farmer having success with cover crops

~COVER CROPS~ When, Why, and Where?



Williams Soil & Water Conservation District 1120 West High St. Bryan Ohio 43506 Phone 419-636-9395 419-636-2349 Ext 3 www.williamsswcd.org



WHAT ARE COVER CROPS?

Cover crops are plants grown during the offseason when cash crops are not being produced.

Enhancement of Soil Structure	Improvement in Soil Fertility	Pest Management
 Increase organic matter Increase beneficial microorganisms & earthworms Improve aggregation Improve aeration Improve water holding capacity Improve water 	 Nutrient cycling Increase nitrogen fixation Enhance phosphorus availability PH buffering Energy & Nutri- ent source for soil biota 	 Habitat for beneficial insects Weed suppression Help control nematodes
 Improve water infiltration Reduce soil compaction Reduce erosion and soil crusting 		

Benefits of Cover Crops

SUMMARY

Using cover crops offers the possibility for many benefits of enhancing soil quality, nutrient cycling, pest management, as well as improving water quality and soil conservation. Cover crops also has its set backs, including increased labor and cost, the chance of delayed planting, and increased risk of certain pests. Whatever you decide you must weigh the options and choose what works best for your farming operation.

MANAGING COVERCROPS

When using cover crops there are more managing decisions to consider.

- Decide what benefits from cover crops you need in your operation.
- Which cover crop fits best in your crop rotation?
- How and when to get the cover crop of your choice planted.
- How to control the cover crop.
- Choosing the best chemical program that will work with your cover crop and cash crop.
- Timing of when to spray cover crop.
- Identifying the best time and place for a cover crop.
- How to manage the extra crop residue.



TYPES OF COVER

CEREAL GRAINS

- Cereal Rye
- Wheat
- Oats
- Triticale

GRASSES

- Annual Ryegrass
- Sudangrass

LEGUME

- Hairy Vetch
- Red Clover
- Crimson Clover
- Field Peas
- Cow Peas

OTHER

- Oilseed Radish
- Turnips
- Buckwheat

CEREAL RYE AS A FALL COVERCROP



- Germinates quickly
- Planting rates
 - Drilled (50-80 lbs/acre)
 - Spread (80-120 lbs/acre)
- Seeding depth 1 inch or less
- If broadcasted incorporate with harrow or packer to improve stand establishment
- Planting dates first of August through the end of October
- When planting later use higher planting rates
- With the later planting dates it may give you the opportunity to drill or Page 4

Annyal Rus	Sudangrace	Hairy Vetal	Red Clover	Crimson CL	Field Pear	Oilseed B	Cow Peas	Turnips	Buckwhea+	
Y	Y									
		Y	Y	Y	Y		Y			
Υ	Ν	Y	Ν	Y	Y	Y	Y	Y	N	
	Y		Y				Y		Υ	
		Y	Y	Y	Y		Y			
G	N	Р	G	G	Р	N	N	N	N	
Е	G	G	Е	E	G	G	G	G	Ρ	
Υ	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Y	N	Y	N	Y	N	N	N	N	N	
Υ	N	N	N	Y	N	Y	N	N	N	
	Y G E Y Y Y	Y Y N Y N Y Y Y N Y Y N Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y <	Y N N Yunyai Kegrass Y Y Y Yunyai Kegrass Y Y Y Yunyai Yunyai Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y N Y Y Y Y N Y Y Y Y N Y Y Y Y N N N Y Y N N N Y Y N N N Y Y N N N Y Y N N N Y Y N N N Y Y N N N Y Y N N N Y Y N N N Y Y	Yunyai Yunyai Yunyai Yunyai <td< td=""><td>Yunyal Ryegrass Yunyal Ryegrass</td><td>A N N N A Mnyal Ryegrass A N N N A N N N A N N N N N N N N A N N N N N N N N A N N N N N N N N A N N N N N N N N N A N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N<!--</td--><td>A N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N</td><td>A N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N</td></td></td<>	Yunyal Ryegrass Yunyal Ryegrass	A N N N A Mnyal Ryegrass A N N N A N N N A N N N N N N N N A N N N N N N N N A N N N N N N N N A N N N N N N N N N A N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N </td <td>A N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N</td> <td>A N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N</td>	A N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N	A N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N N

	Cereal Rus	Wheat	O _{a†s}	Triticale	
Cereal Grain	Υ	Υ	Y	Y	
Grass					
Legume					
Fall Cover Crop	Υ	Υ	Y	Y	
Summer Cover Crop			Y		
Produces Nitrogen					
Winter Hardy	E	Е	N	E	
Deep Root System	G	G	G	G	
Plant after Wheat Harvest	Y	Y	Y	Y	
Plant after Corn Harvest					
Plant after Bean Harvest	Y	Y	Y	Y	
Flown on standing corn or beans	Y	Y	Y	Y	

Key

Y = Yes

N = No

P = Poor

G = Good

CEREAL RYE AS A FALL COVERCROP

- Cereal rye is most winter hardy of small grains
- Prevents soil erosion and nutrient run-off.
- Improves soil organic profile and soil health.
- It has an extensive and deep root system that will
 - Break up compaction layers
 - Increase water infiltration
 - Recovers and recycles nutrients from soil profile.
 - Makes root pathways that cash crops use to find moisture and nutrients.
 - Captures nitrogen and releases it when plant decays.
- Can be used as supplemental forage for livestock.
- Improves crop yields.

ANNUAL RYEGRASS AS A FALL COVERCROP



- Germinates quickly (7-10 Days)
- Planting rates
 - Drilled (12-15 lbs/acre)
 - Aerial (25 lbs/acre)
 - Spread (20 lbs/acre)
- Seeding depth 1/2 inch or less
- If applied aerial apply before leaf drop
- If broadcasted incorporate with harrow or packer to improve stand establishment
- Planting dates end of August
 through the first of October
- Later planting use higher planting rates

BUCKWHEAT AS A COVERCROP



- A summer covercrop
- Used as a companion crops with cowpea, oats, sudangrass, and sorghum
- Planting rates 30-60 lbs/acre drilled or broadcasted
- If broadcasted needs to be incorporate
- Seeding early June through late July
- Winter kills
- Good fit for organic and vegetable farms
- Helps prevent soil erosion and nutrient runoff
- Recovers and recycles unused nutrients
- Improves soil organic profile
 and soil
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SUDANGRASS & SORGHUM



- A summer covercrop
- Used as a companion crops with cow pea and buckwheat
- Planting rates 20-40 lbs/acre drilled or broadcasted
- If broadcasted incorporate with harrow or packer to improve stand establishment
- Seeding early May through late June
- Winter kills
- Helps prevent soil erosion and nutrient runoff
- Recovers and recycles unused nutrients
- Improves soil organic profile and soil health.
- Good supplemental forage for livestock

ANNUAL RYEGRASS AS A FALL COVERCROP

- Winter hardy better if established early
- Prevents soil erosion and nutrient run-off.
- Improves soil organic profile and soil health.
- It has an extensive and deep root system 36+ inches that will
 - Break up compaction layers
 - Increase water infiltration
 - Recovers and recycles nutrients from soil profile.
 - Makes root pathways that cash crops use to find moisture and nutrients.
 - Captures nitrogen and releases it when plant decays.
- Can provide supplemental forage for livestock.
- Improves crop yields

WHEAT AS A FALL COVERCROP



- Planting rates 60-90lbs/acre drilled or broadcasted
- Seeding after fly free date through late October
- Later planting dates may allow you to apply after corn or bean harvest
- If planting late use higher planting rates
- If broadcasted incorporate with harrow or packer to improve stand establishment
- Winter hardy but better if well established
- Helps prevent soil erosion and nutrient run-off
- Recovers and recycles unused nutrients

FORAGE TURNIPS AS A FALL COVERCROP



- Seeding rate 4-8 lbs/acre drilled or broadcasted
- If broadcasted incorporate with harrow or packer to improve stand establishment
- Planting date first of August through end of September.
- Usually mixed with annual ryegrass, cereal rye, or oats
- Fast growth that provides quick ground cover
- Helps prevent soil erosion and nutrient run off
- Scavenges nitrate from soil
- Winter kills
- Improves crop yields

OILSEED RADISH AS A FALL COVERCROP



- Seeding rate 10-12 lbs/acre drilled or broadcasted
- If broadcasted incorporate with harrow or packer to improve stand establishment
- Planting date first of August through end of September.
- Usually mixed with annual ryegrass, cereal rye, or oats
- Fast growth that provides quick ground cover
- Helps prevent soil erosion and nutrient run off
- Scavenges nitrate from soil
- Winter kills
- Improves crop yields
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TRITICALE AS A FALL COVERCROP



- Cross between wheat and rye
- Planting rates 60-90lbs/acre drilled or broadcasted
- Seed early August through late October
- Later planting dates may allow you to apply after corn or bean harvest
- If planting late use higher
 planting rates
- If broadcasted incorporate with harrow or packer to improve stand establishment
- Winter hardy but better if well established
- Helps prevent soil erosion and nutrient run-off
- Recovers and recycles unused nutrients

OATS AS A FALL COVERCROP



- Used as a companion crop with other covercrops
- Planting rates 30-50bs/acre drilled or broadcasted
- Seeding early August through mid September
- If broadcasted incorporate with harrow or packer to improve stand establishment
- Winter kills
- Helps prevent soil erosion and nutrient run-off
- Recovers and recycles unused nutrients
- Improves soil organic profile and soil health.
- Good supplemental forage for
 Page livestock

RED CLOVERS AS A COVERCROP



- Red clover is a summer covercrop
- A legume that requires a specific vetch inoculum applied to seed before planting
- Planting rates 5-12 lbs/acre drilled or broadcasted
- Seed late February through late May
- Can be frost seeded into wheat
- Produces nitrogen the amount depends summer growth.
- Will over winter
- Good fit for organic and vegetable farms
- Helps prevent soil erosion and nutrient run-off
- Improves soil organic profile and soil health.
- Good supplemental forage for livestock
- Improves crop yields

CRIMSON CLOVER AS A FALL COVERCROP



- A legume that requires a specific vetch inoculum applied to seed before planting
- Planting rates 10-12 lbs/acre drilled 12-20 lbs/ acre broadcasted
- Seed mid July through early September the earlier planting the better.
- Can be planted in combination with other fall cover crops
- Does best drilled in after wheat harvest
- Produces nitrogen the amount depends on fall and spring growth.
- Will over winter
- Good fit for organic, vegetable, fruit farms
- Helps prevent soil erosion and nutrient run-off
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- Improves soil organic profile and soil health.
 - Good ourplamantal forage for live

HAIRY VETCH AS A FALL COVERCROP



- Improves crop yields
- Is a legume an requires a specific vetch inoculum applied to seed before planting
- Planting rates 20-30bs/acre drilled or broadcasted then incorporated.
- Seed late July through early September the earlier planting the better.
- Recommended to plant in combination with oats, annual ryegrass or wheat
- Produces nitrogen the amount depends on fall and spring growth.
- Will over winter in northern states but diseases often damages or kills stands.

COW PEAS AS A FALL COVERCROP



- Is a legume an requires a specific vetch inoculum applied to seed before planting
- Planting rates 30-40 lbs/acre drilled 70-90 lbs/acre broadcasted
- Seed first of July through early September the earlier planting the better.
- Recommended to plant in combination with oats, annual ryegrass or wheat
- Is a lot like soybeans but has a more extensive root system that can explore deep in the soil
- Produces nitrogen the amount depends on fall growth.
- Will winter kill.

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- Good fit for organic and vegetable farms
- Helps prevent soil erosion and nutrient run-off

FIELD PEAS AS A FALL COVERCROP



- A legume that requires a specific vetch inoculum applied to seed before planting
- Planting rates 40-50lbs/acre drilled 70-90 lbs/acre broadcasted
- Seed first of August through early September the earlier planting the better.
- Recommended to plant in combination with oats, annual ryegrass or wheat
- Produces nitrogen; but the amount depends upon fall growth.
- Will over winter in northern states but diseases often damage or kill stands
- Good fit for organic and vegetable farms