


Cover Crops for Organic Production

Dr. Gary Bates
Forage Specialist
Plant Sciences

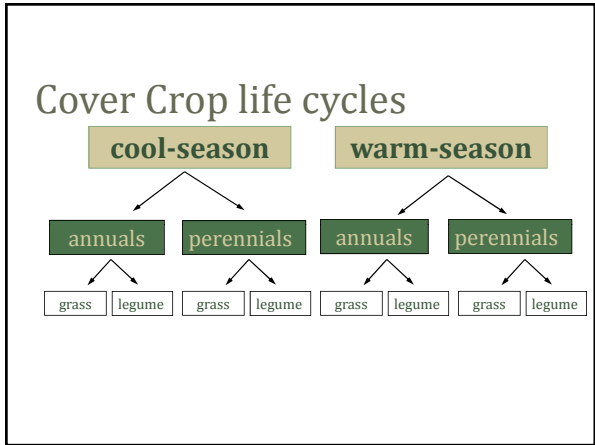


Cover crops

- Any plant(s) grown as ground cover. Generally used to improve some condition associated with sustainable agriculture.
 - Pests
 - Soil fertility
 - Soil structure
 - Water

Cover crops

SOIL FERTILITY ◦nitrogen ◦phosphorous ◦potassium	PESTS ◦weeds ◦insects ◦disease	SOIL STRUCTURE ◦organic matter ◦soil erosion	WATER ◦water infiltration
--	--	---	-------------------------------------



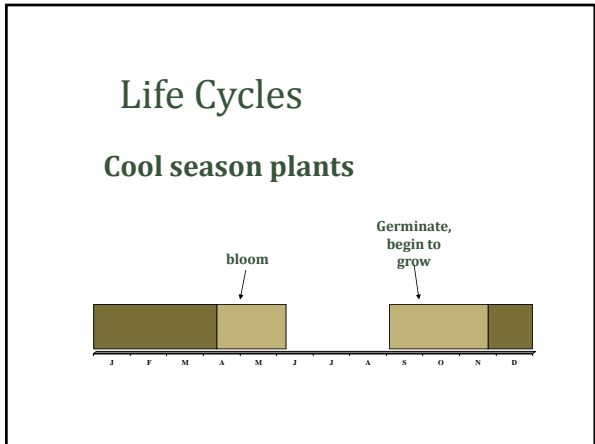
Life Cycles

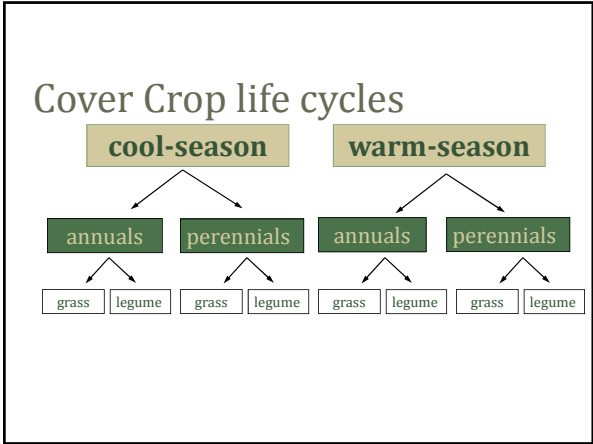
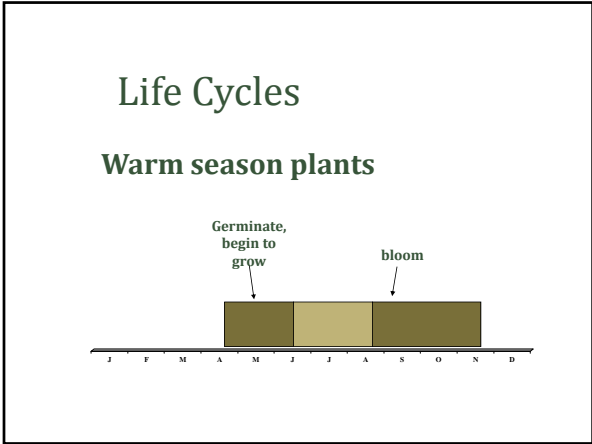
Annuals

- germinate, grow, bloom in 1 growing season
- usually easier to kill

Perennials

- live more than one year
- more difficult to kill





Legume species

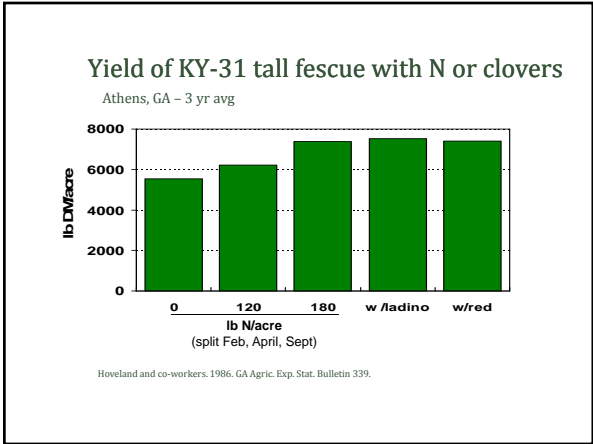
<u>Perennials</u>	<u>Annuals</u>
white	arrowleaf
red	berseem
alfalfa	persian
	subterranean
	crimson
	vetch
	Austrian winter pea

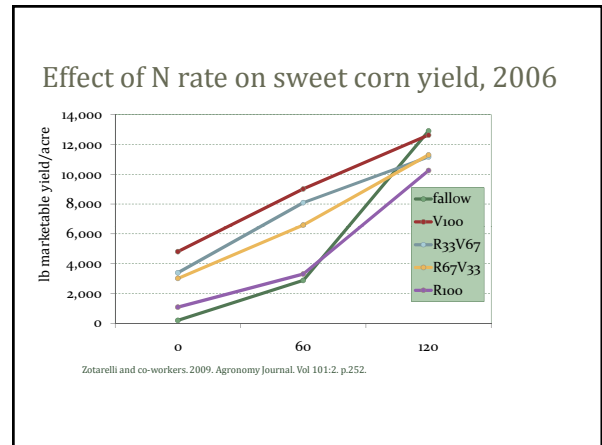
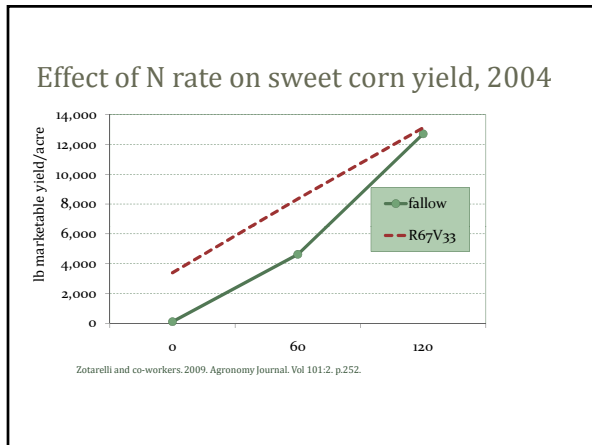
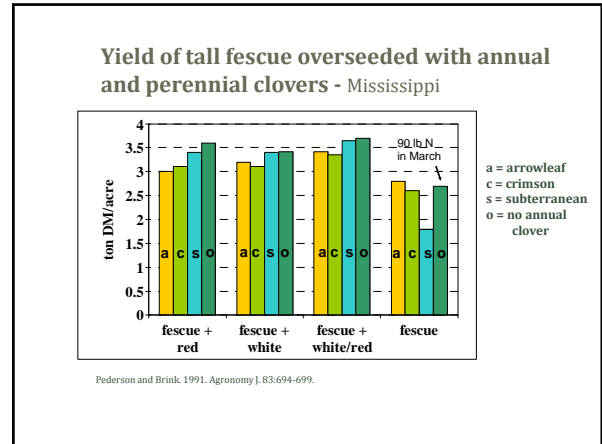
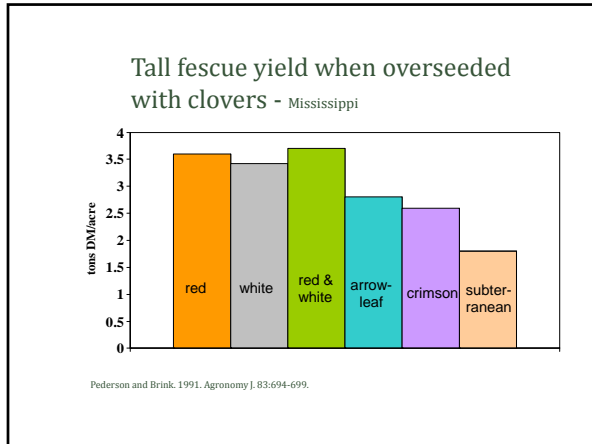
Non-legume species

<u>Perennials</u>	<u>Annuals</u>
tall fescue	rye
orchardgrass	wheat
	oats
	annual ryegrass
	Brassicacae

**SOIL
FERTILITY**

- ⌘nitrogen
- ⌘phosphorous
- ⌘potassium

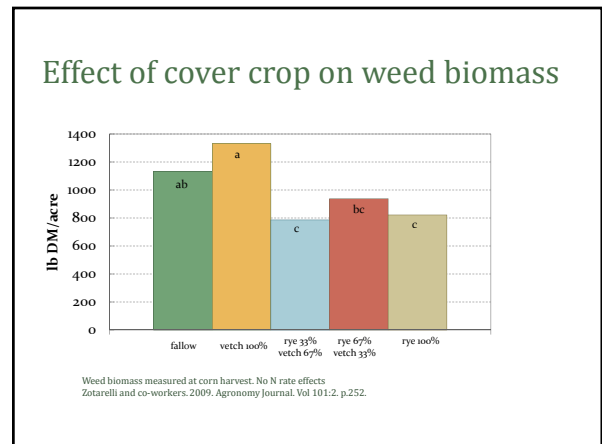


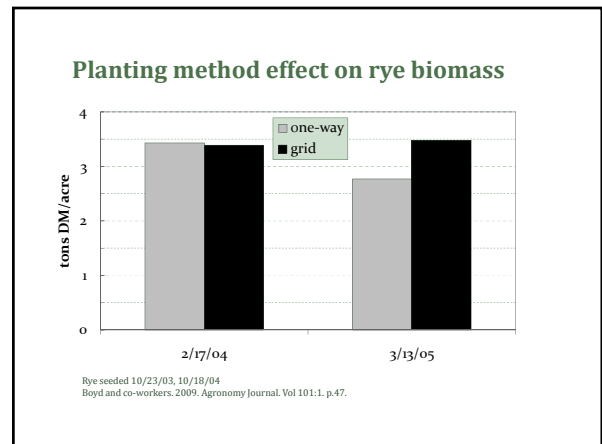
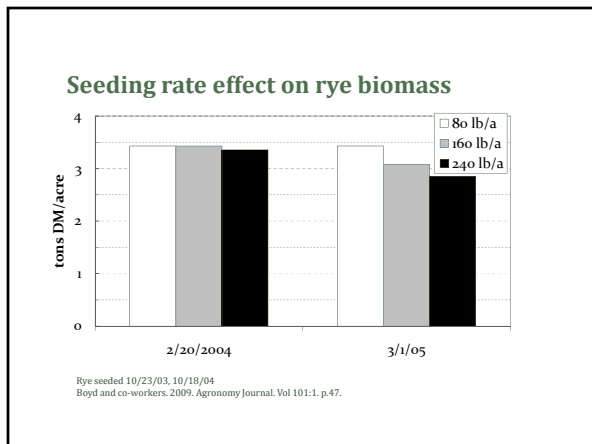
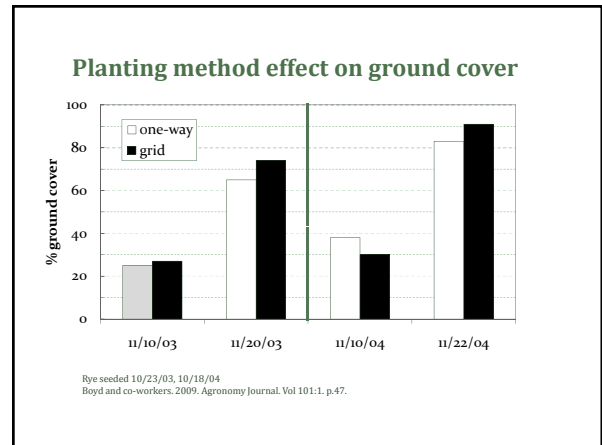
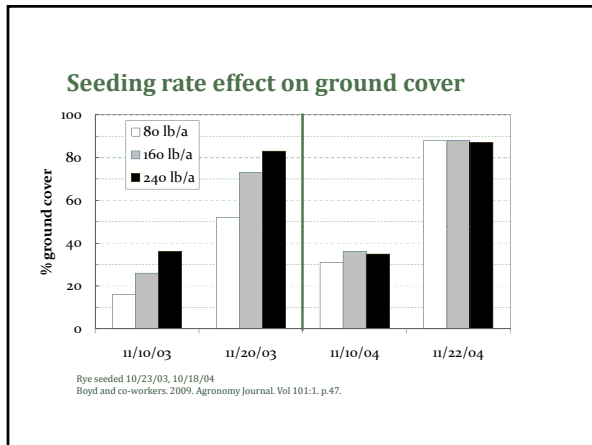
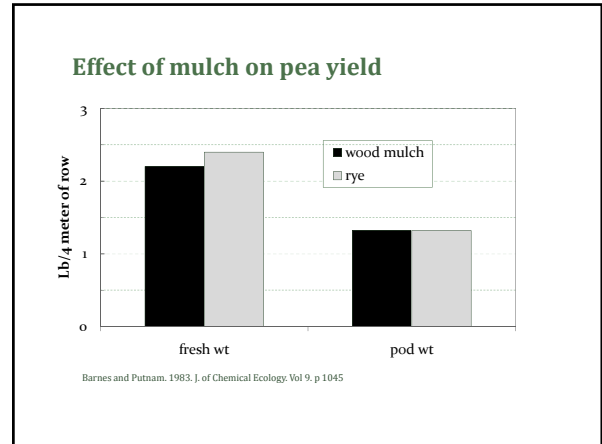
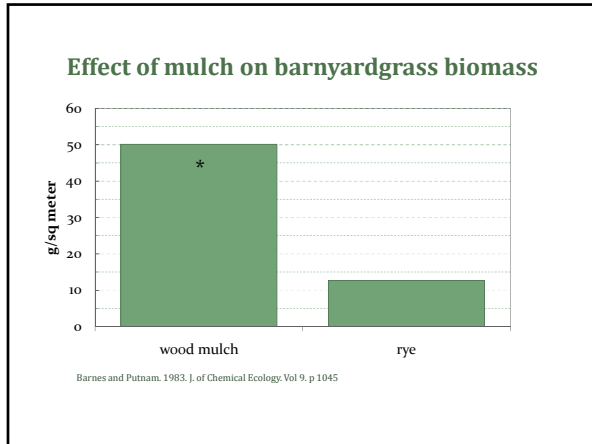


PESTS

- weeds
- disease
- insects

©Cornell Univ.

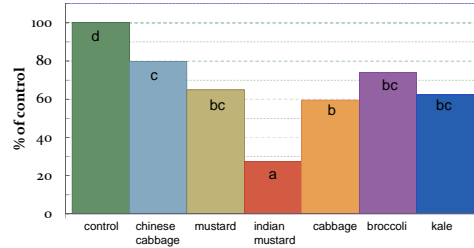




Brassicas as biofumigant

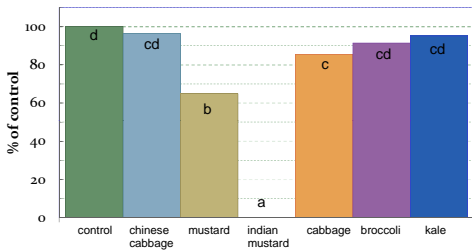


Effect of *Brassica* leaf tissue on *Rhizoctonia solani* growth



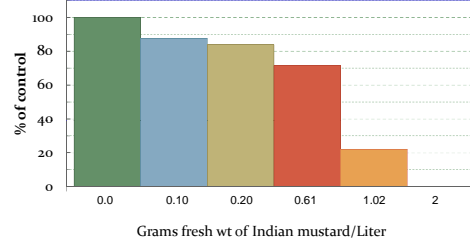
Charron and Sams. 1999. J. Amer. Society of Hort. Science. Vol. 124:5. p. 467.

Effect of leaf tissue on *Pythium ultimum* growth



Charron and Sams. 1999. J. Amer. Society of Hort. Science. Vol. 124:5. p. 467.

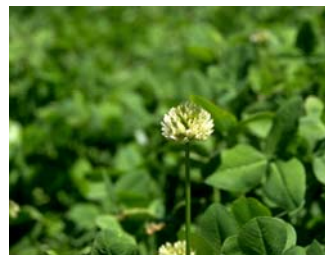
Effect of Indian mustard on *Sclerotium rolsfii* growth



Harvey and Sams. 2002. J. Amer. Society of Hort. Science. Vol. 127:1. p. 27.

Species For Cover Crops

White Clover



- widely adapted
- difficult to kill
- easy to establish
- inexpensive
- living mulch

Red Clover



- widely adapted
- easy to establish
- tall growing
- more drought tolerance

Arrowleaf Clover



- annual
- good reseeder
- upright growing
- yields well
- late maturity
- limited cold tolerance

Crimson Clover



- annual
- widely adapted
- early maturity
- late winter/spring production
- crown rot potential

Subterranean Clover



- annual
- good reseeder
- limited cold tolerance
- forms thick mat

Turnips



- annual
- easy to establish
- inexpensive
- biomass
- biofumigant

Annual Grasses



- wheat, rye, oats, annual ryegrass
- maturity differences
- cold tolerance

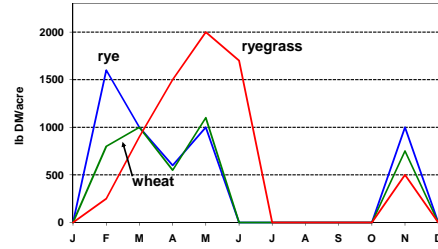
Rye vs Annual Ryegrass



Annual ryegrass

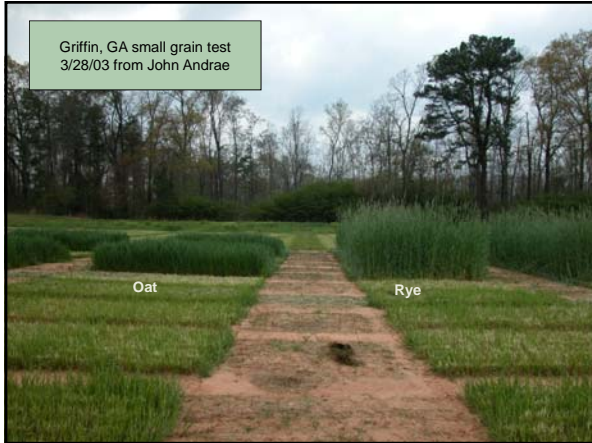
Rye

Yield of cool-season annual grasses



Daniel and co-workers, 1983, NC Agric. Exp. Stat. Progress Rep. 91

Griffin, GA small grain test
3/28/03 from John Andrae



Griffin, GA small grain test
3/28/03 from John Andrae



Considerations

- Crop to be planted
- Maturity differences between cover species
- Ease of killing
 - mowing vs rolling
- Nitrogen
- Weed control
- Disease