Midwest Cover Crops Council

Resources for Cover Crop Success

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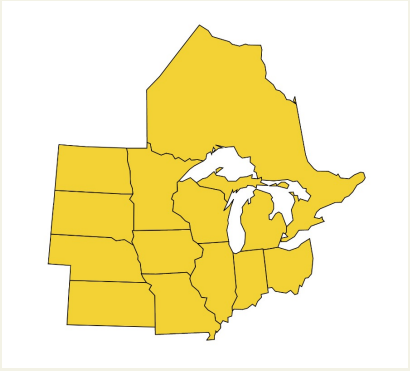
December 15, 2021

Welcome

The mission of the Midwest Cover Crops Council is to facilitate widespread adoption of cover crops across the Midwest.



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Overview of resources, new/revised

- Website
- Pocket guide
- Recipes
- Decision tool
- Seeding Rate Calculator
- Crop Advisor Modules
- Conference

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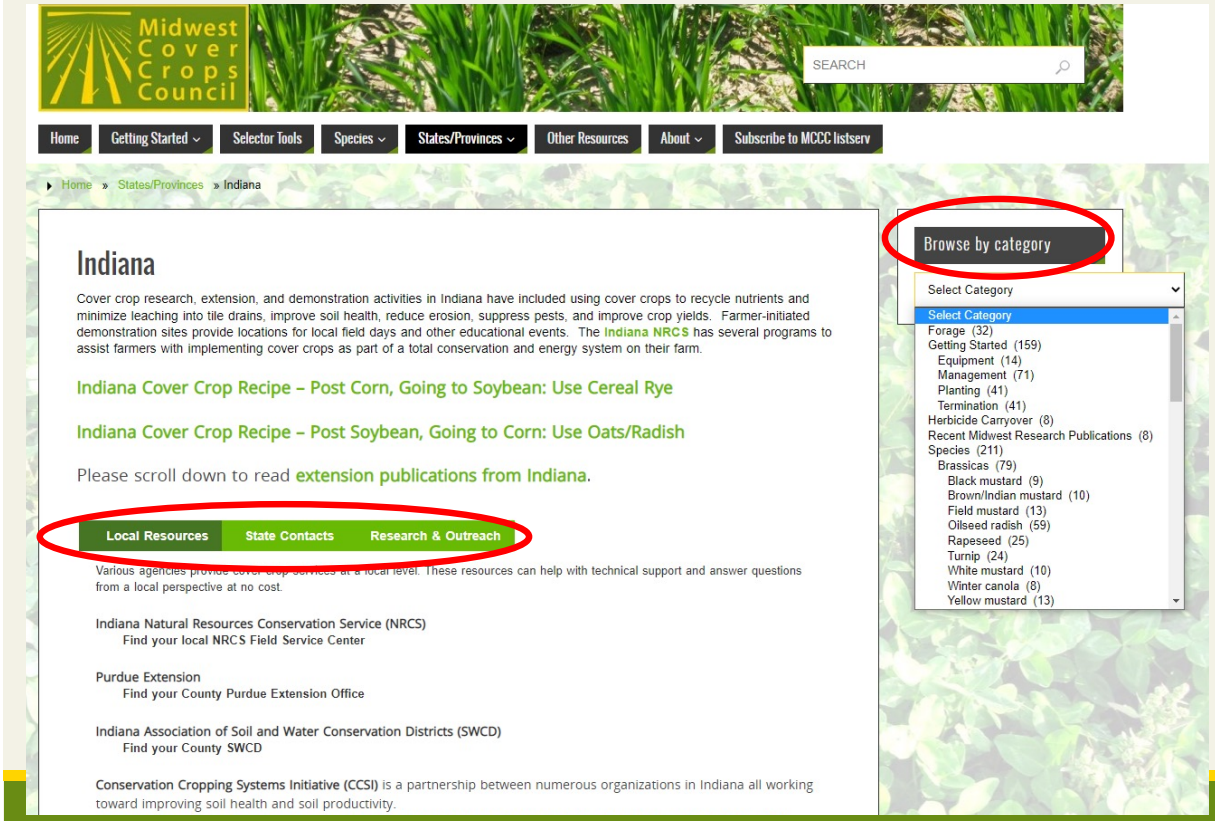
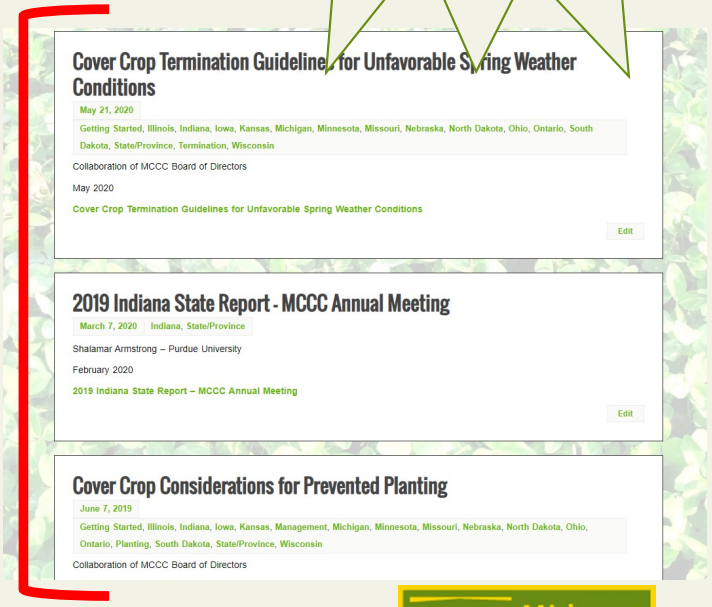
www.midwestcovercrops.org

Bookmark our new site!





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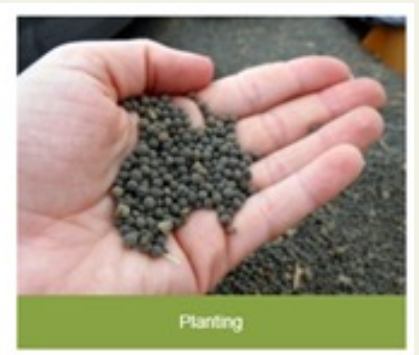
Getting Started

- Cover Crop Recipes
- Planting
- Equipment
- Management
- Termination



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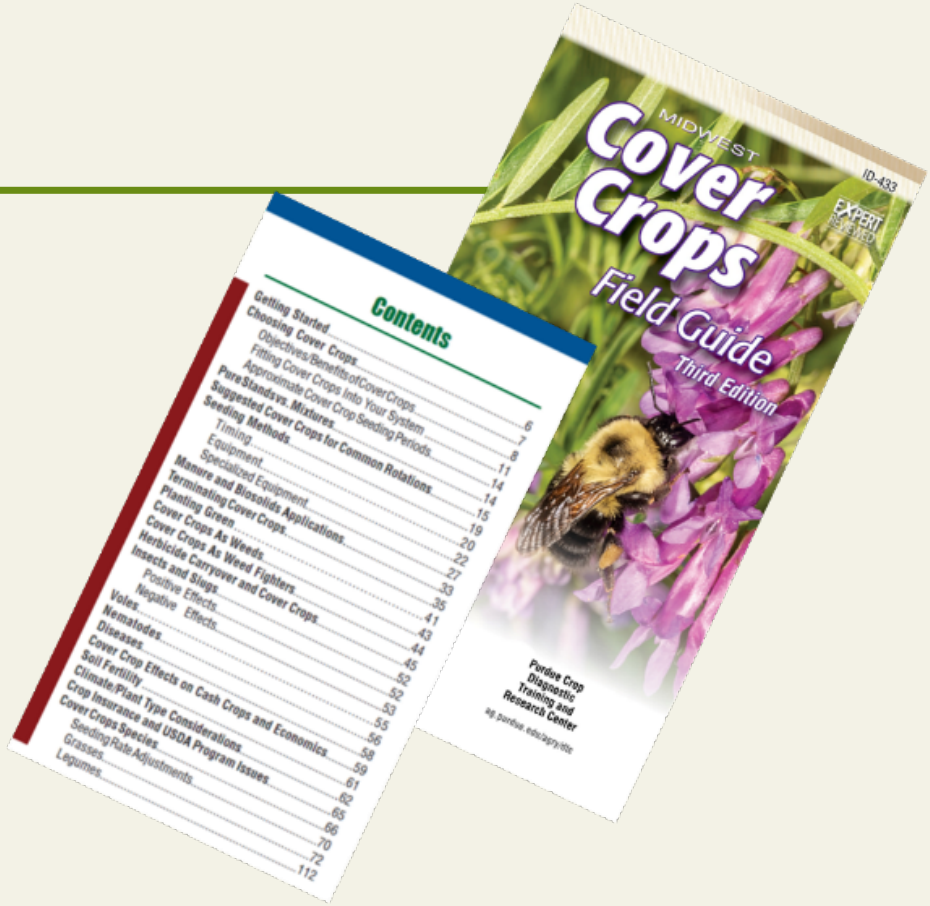
Field Guide

3rd edition is printed and available for order!



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Basic Structure of the Guide

25% more content!

1. Getting started, choosing cover crops, suggested covers
2. Seeding methods
3. Terminating cover crops, planting green, herbicide carryover
4. Pests—insects, slugs, voles, nematodes, diseases
5. Effects on cash crops, economics, climate/plant type considerations, crop insurance and USDA program considerations
6. Species sections, with characteristics, goal ratings, seeding rates, and cautions for grasses, legumes, non-legume broadleaves, up-and-coming species, and species commonly used in mixes.

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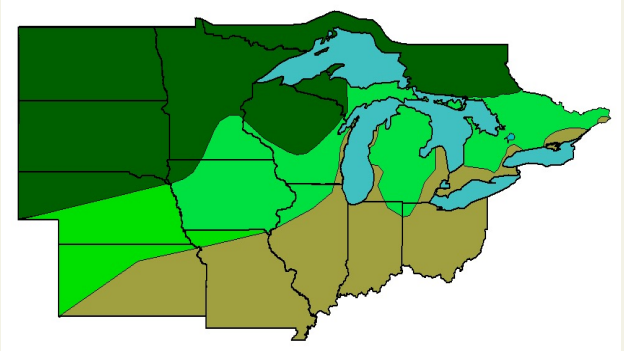
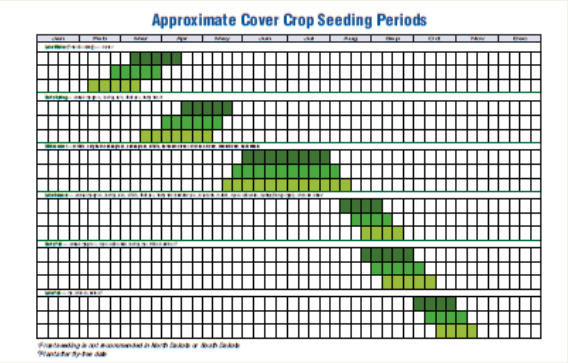
Cover Crop Seeding Windows

- Climate data has been updated
- Recommended seeding dates across the Midwest were revised
- More locally precise dates in the decision tool





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Cover Crop Seeding

Producers and manufacturers continue to develop/modify equipment for planting cover crops in a timely manner. New specialized equipment has been detailed in the new edition.

Specialized Equipment added:

- Early season interseeder
- Harvester mounted seeder
- Tillage tool mounted seeder
- Drone

Cover Crop Termination Guidelines

- For farmers new to growing cover crops
  - 2 weeks before planting or
  - when cover crops are 6-12 inches tall
  - and actively growing

- With experience, farmers may find they can maximize benefits by terminating later

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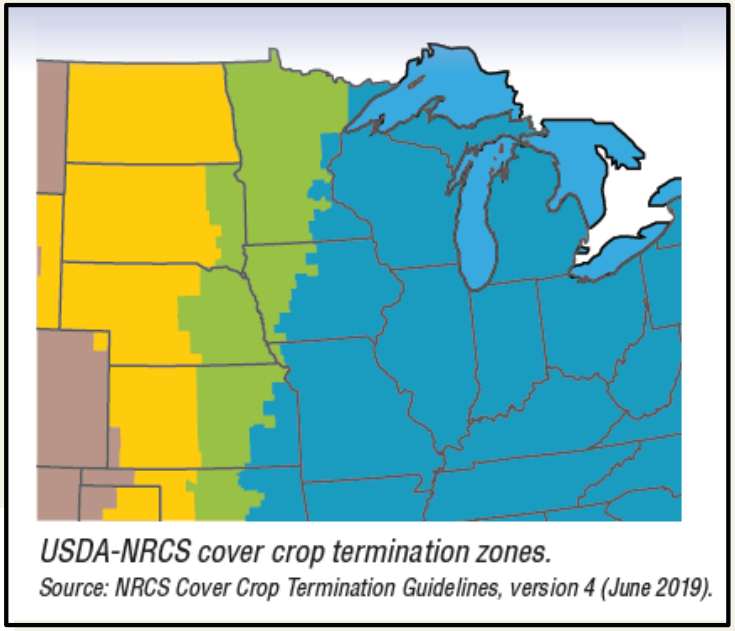
Termination Guidelines

- USDA map provides termination deadlines for RMA eligibility
- Check out “Cover Crop Termination Guidelines for Unfavorable Spring Weather Conditions” on midwestcovercrops.org



USDA-NRCS cover crop termination zones.
Source: NRCS Cover Crop Termination Guidelines, version 4 (June 2019).

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Planting Green

- Planting a cash crop directly into a standing cover crop that is still green
- Has grown in popularity the last several years, particularly with soybeans.
- Advantages and challenges are discussed.

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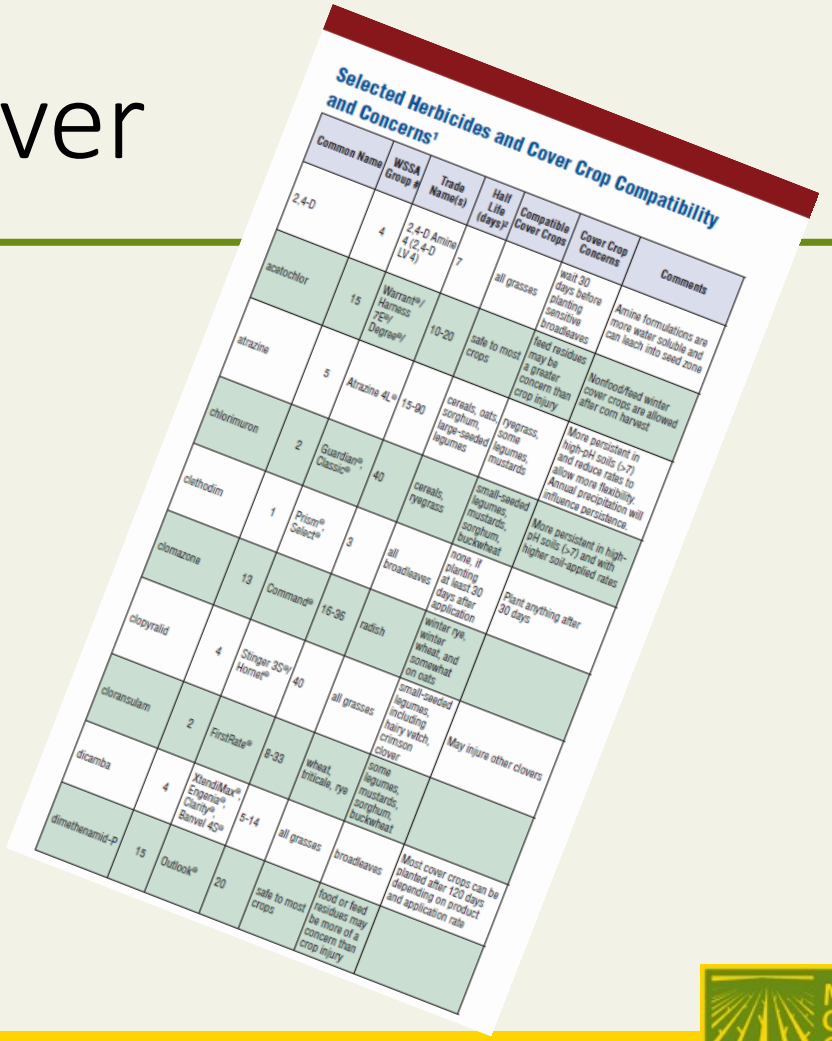
Herbicide Carryover

- Corn and Soy herbicides are listed in the same table
- Organized by common name, instead of trade name



Selected Herbicides and Cover Crop Compatibility and Concerns[1]

Common Name	WSSA Group #	Trade Name(s)	Half Life (days)[2]	Compatible Cover Crops	Cover Crop Concerns	Comments
2,4-D	4	2,4-D Amine 4 (2,4-D LV 4)	7	all grasses	wait 30 days before planting sensitive broadleaves	Amine formulations are more water soluble and can leach into seed zone
acetochlor	15	Warrant®/ Harness 7E®/ Degree®/	10-20	safe to most crops	feed residues may be a greater concern than crop injury	Nonfood/feed winter cover crops are allowed after corn harvest
atrazine	5	Atrazine 4L®	15-90	cereals, oats, sorghum, large-seeded legumes	ryegrass, some legumes, mustards	More persistent in high-pH soils (>7) and reduce rates to allow more flexibility. Annual precipitation will influence persistence.
chlorimuron	2	Guardian®, Classic®	40	cereals, ryegrass	small-seeded legumes, mustards, sorghum, buckwheat	More persistent in high-pH soils (>7) and with higher soil-applied rates
clethodim	1	Prism®, Select®	3	all broadleaves	none, if planting at least 30 days after application	Plant anything after 30 days
clomazone	13	Command®	16-36	radish	winter rye, winter wheat, and somewhat on oats	
clopyralid	4	Stinger 3S®/ Horne®	40	all grasses	small-seeded legumes, including hairy vetch, crimson clover	May injure other clovers
cloransulam	2	FirstRate®	8-33	wheat, triticale, rye	some legumes, mustards, sorghum buckwheat	
dicamba	4	XtendiMax®, Engenia®, Clarity®, Banvel 4S®	5-14	all grasses	broadleaves	Most cover crops can be planted after 120 days depending on product and application rate
dimethenamid-p	15	Outlook®	20	safe to most crops	food or feed residues may be more of a concern than crop injury	

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Cover Crop Economics

- Possible positive and negative effects on cash crop yields.
  - Experience and good management can boost success.
- Soil productivity and health improve slowly over many years.
  - May improve yields more in stressful years than in years with good weather.

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Cover Crop Economics

- Economic impacts vary greatly, depending on:
  - Specific cover crop and cash crop,
  - specific management practices,
  - weather and climate, and
  - length of time the system has included cover crops.
- SARE Technical Bulletin is referenced, for other short-term economic benefits possible, such as weed control, ameliorating soil compaction, integrating livestock, and others

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Cover Crop Species

office to be aware of their requirements.

Cover Crops Species

The following pages provide basic information about several of the region's most common cover crop species:

66

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Cover Crop Species

- All seeding rates are given as a range to encompass a wide set of conditions and purposes
- Updated photos
- Leaf collar region photos for grass identification

Seeding Rate Adjustments

All seeding rates are given as pure live seed (PLS) — see page 186.

Seeding rates are given as a range. The drilled rates are at the low end, broadcast with shallow incorporation rates are typically 10 percent higher than the drilled rate, and broadcast without incorporation seeding rates are typically 20 percent higher than the drilled rate. Some species may require an even higher rate for aerial seeding (for example, annual ryegrass). When deciding on which rate to use, remember to adapt these recommendations to the conditions where (and when) you plant:

Reasons to increase seeding rates include:

- As you move north, you may need higher seeding rates to achieve the desired biomass.
- As you reach the end of the optimum seeding window, you may need higher seeding rates.
- If weed management, erosion control, or grazing is a primary purpose, then increase seeding rates.
- If seed size is larger than average for your variety (think plants/acre), then you may need to increase seeding rates.
- If you are using coated seed, make sure to calculate PLS (see page 186).

Reasons to decrease seeding rates include:

- As you increase soil fertility and/or add manure, you may need lower seeding rates.
- The better the seed-to-soil contact for the seeding method, the lower the seeding rate.
- The more diverse the seed mix, the lower the seeding rate will be.
- Precision planters require lower seeding rates.

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Popular Cover Crop Species

office to be aware of their requirements.

Cover Crops Species

The following pages provide basic information about several of the region's most common cover crop species:

66

Oats
Cereal Rye

Crimson clover
Hairy vetch

Radish
Rapeseed

New to the Field Guide

White Clover

Forage Brassicas

cabbage, kale, collards, leaf turnip, hybrids

Balansa Clover

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New Section "Species Commonly used in a Mix"

Includes photos of seeds, seedlings, and plants

Common Species in Cover Crop Mixes

	Cool- or Warm-season[1]	Grass, Legume, or Broadleaf[2]	Prostrate, Climbing, or Upright[3]	Biomass Potential (low, medium, high)[4]	Fibrous Root or Tap Root[5]	Seeds/lb.	Seeding Depth (inches)	Comments
chickling vetch *Lathyrus sativus*	C	L	P	L	T	2,500	3/4-1 1/2	Drought tolerant. Use pea/vetch/lentil inoculum.
chickpea *Cicer arietinum*	W	L	U	L	T	2,200	1 1/2-2 1/2	Drought tolerant. Use chickpea inoculum.
common vetch *Vicia sativa*								
faba bean *Vicia faba, minor (use forage type)*								
flax *Linum usitatissimum*								
German/foxtail millet *Setaria italica*	W	G	U	H	F	190,000	1/2-3/4	No prussic acid toxicity.
lentils *Lens culinaris*	C	L	P	L	T	15,000-20,000	1-1 1/2	Drought tolerant. Use pea/vetch/lentil inoculum.
mung bean *Vigna radiata*	W	L	U	M	T	11,000	1 1/4-2 1/4	Drought and heat tolerant. Use peanut/lima bean inoculum.
proso millet *Panicum miliaceum*	W	G	U	H	F	84,000	1/2-3/4	No prussic acid toxicity.
teff *Eragrostis tef*	W	G	U	L	F	1,500,000	1/8-1/4	High-quality forage. Very digestible fiber.

1 C=cool-season. W=warm-season.
2 G=grass. L=legume. B=broadleaf.
3 P=prostrate. C=climbing. U=upright.
4 L=low. M=medium. H=high.
5 F=fibrous root. T=taproot.

Field Guide Available Now!

Go to “Other Resources” on the main menu of www.midwestcovercrops.org

https://edustore.purdue.edu/

$6/guide or 10% discount on a box of 25

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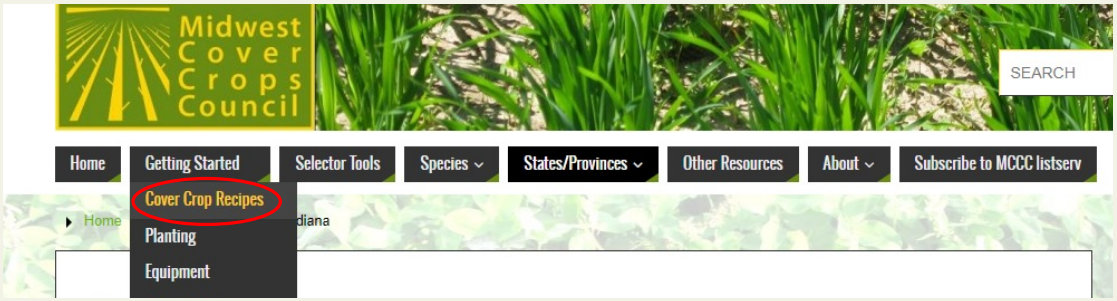
Recipes

These publications are intended to provide a starting point for farmers who are new to growing cover crops. With experience, farmers may fine-tune the use of cover crops for their systems.

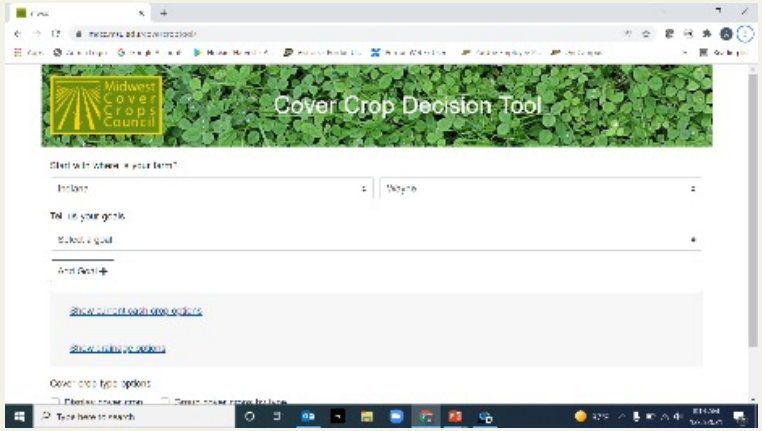


Indiana Recipes

- Post Corn, Going to Soybean: Use Cereal Rye
- Post Soybean, Going to Corn: Use Oats/Radish
- Additional recipes available for other Midwest states

Selector/Decision Tool

- For those wanting more options after the “recipes”, use the Decision Tool
- Mobile friendly
- State teams update periodically (next winter for IN)



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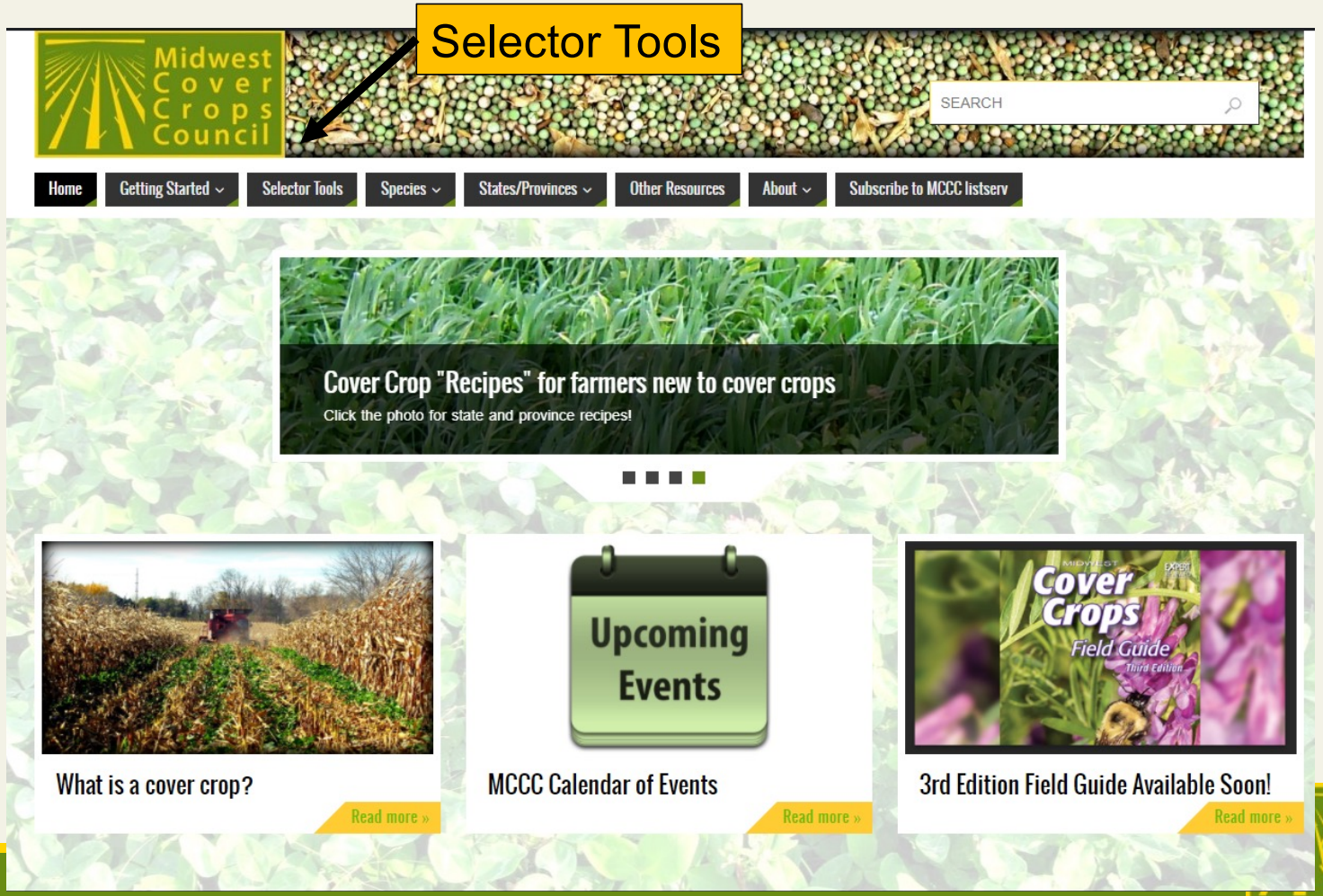

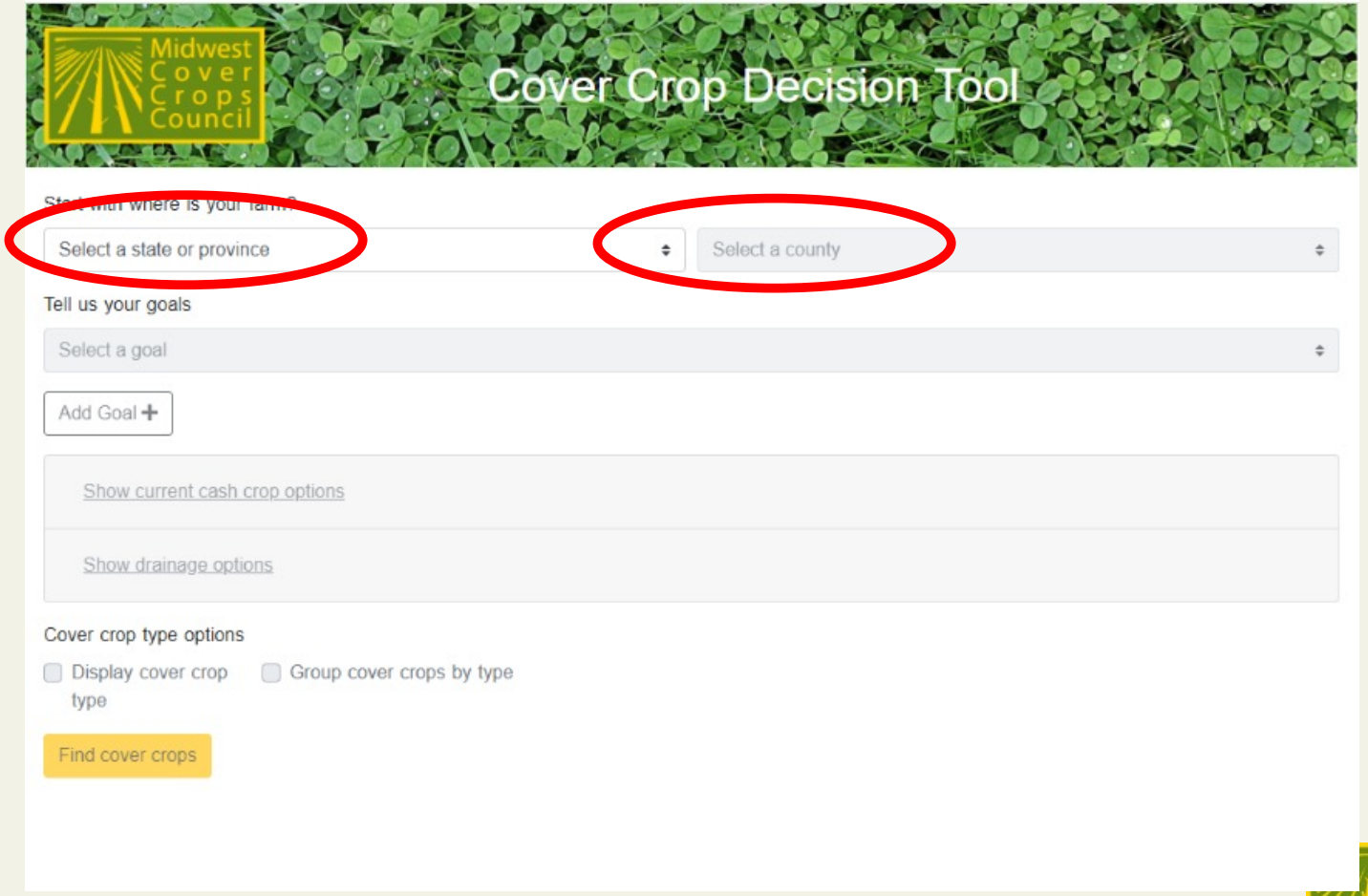
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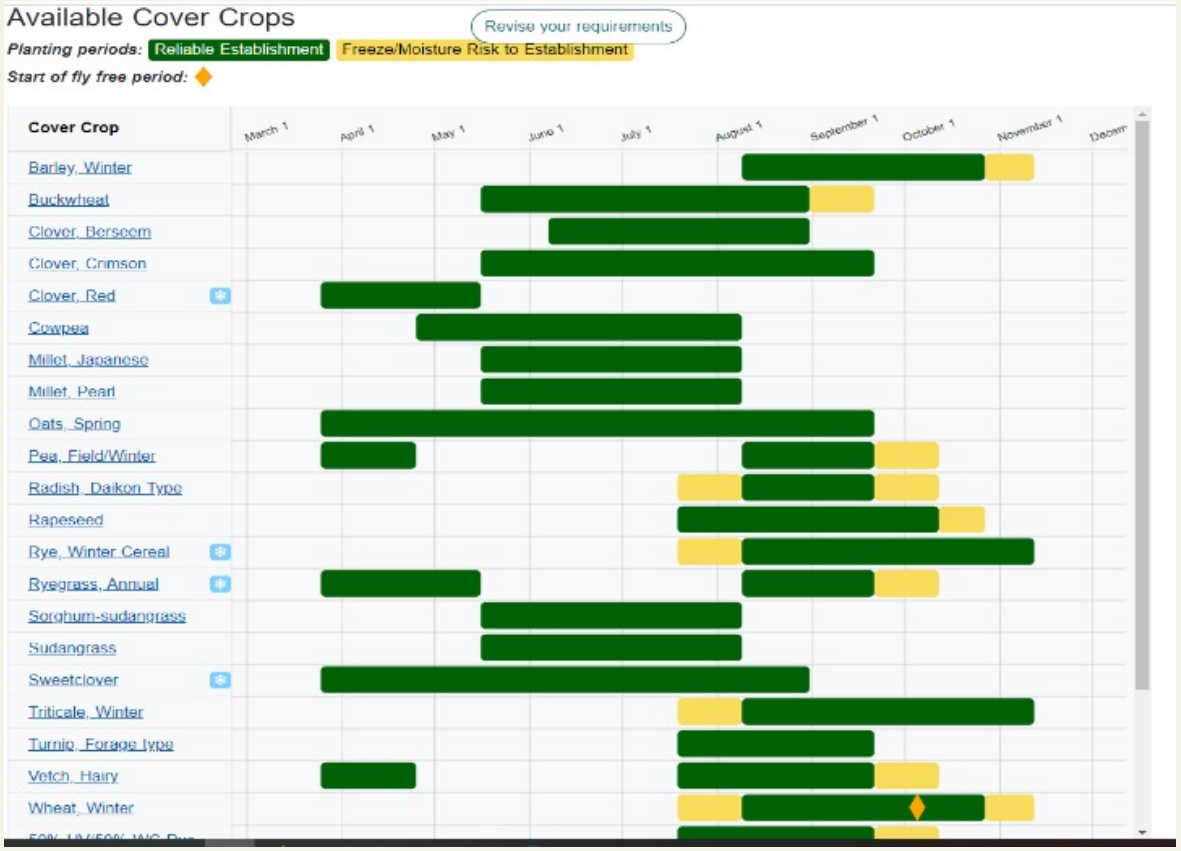
Cover Crop Decision Tool
Select a state or province
Select a county
Tell us your goals
Select a goal
Add Goal +
Show current cash crop options
Show drainage options
Cover crop type options
Display cover crop type
Group cover crops by type
Find cover crops

Lawrence Co., Indiana

www.midwestcovercrops.org
Cover Crop Decision Tool



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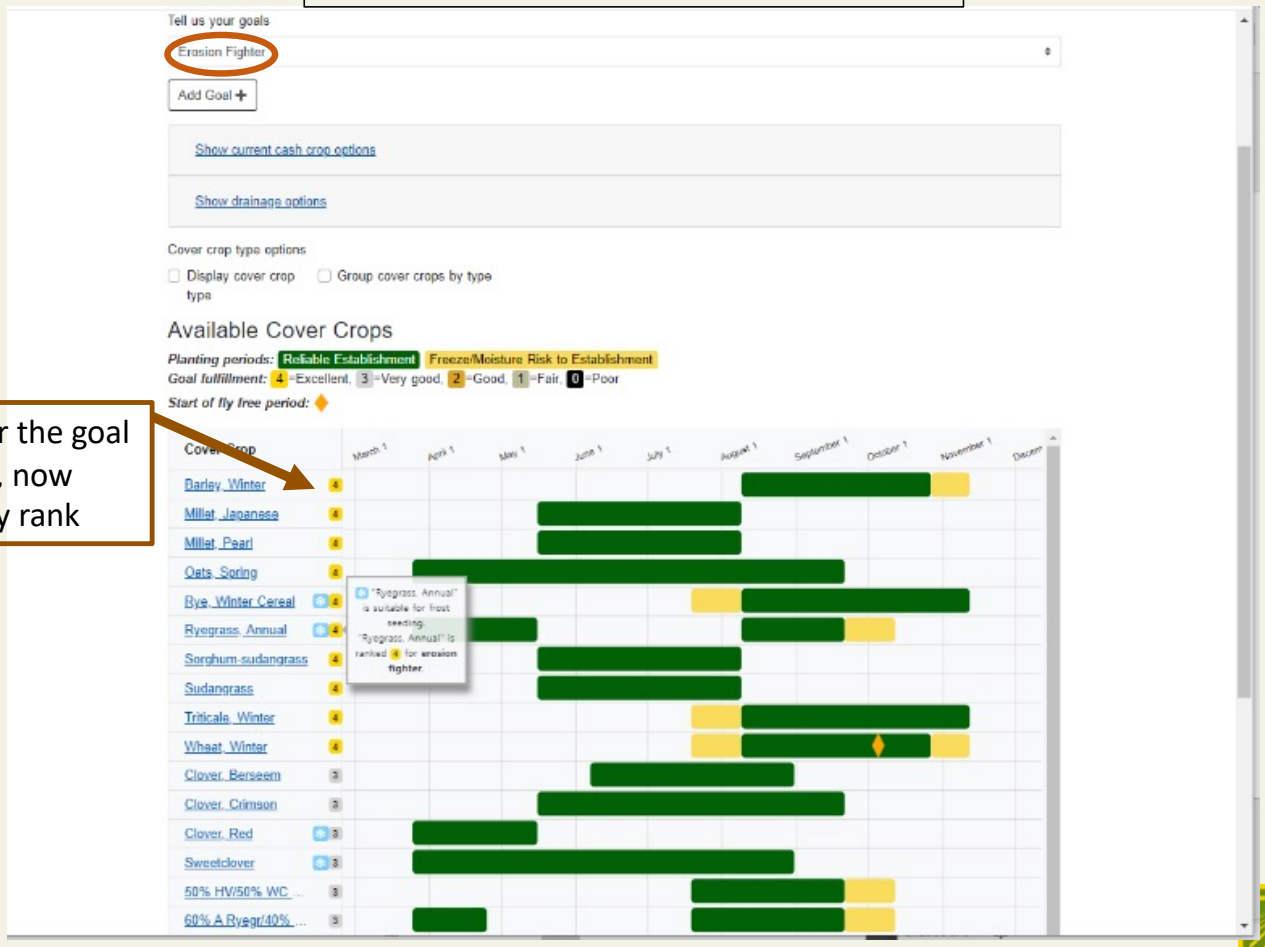
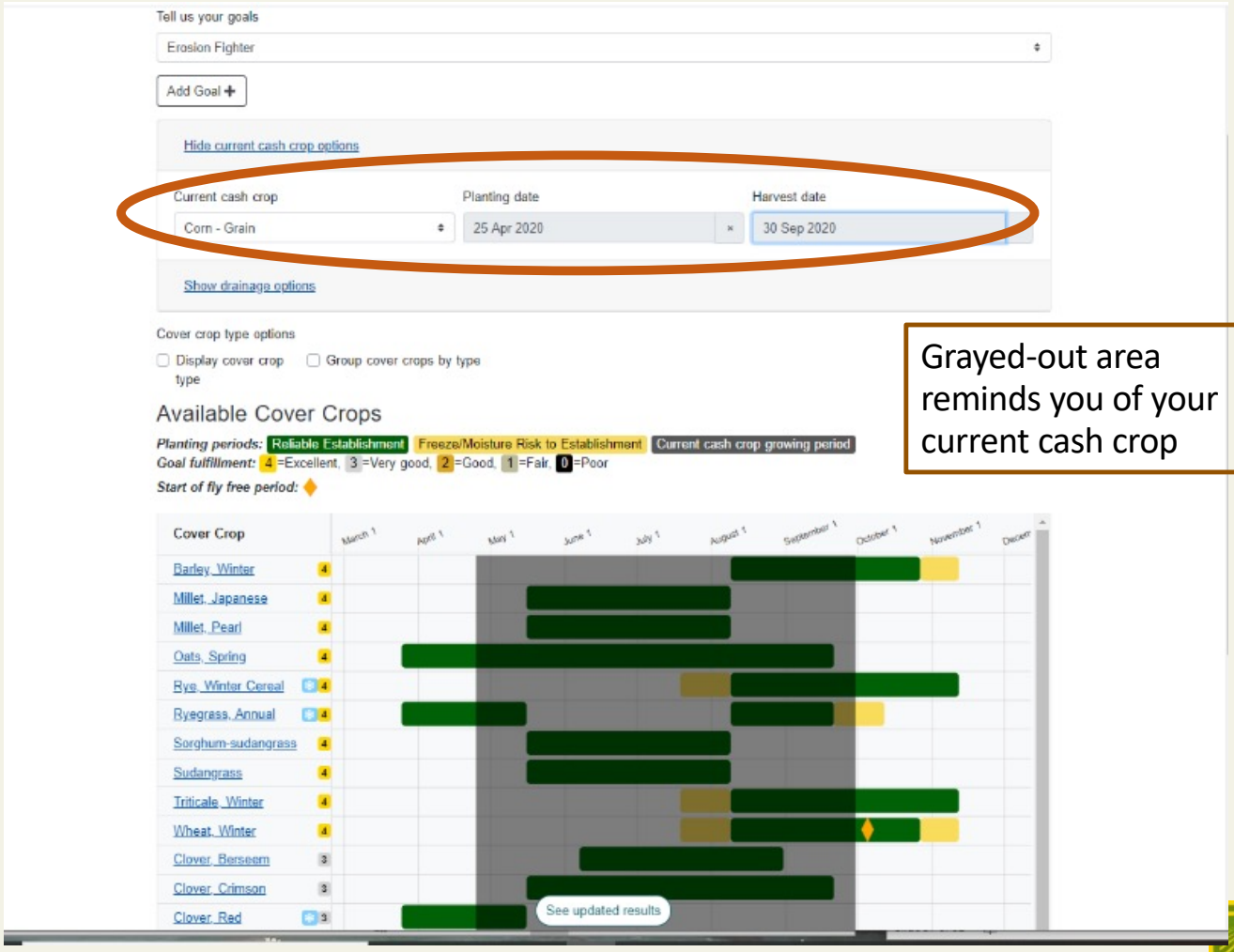
Erosion fighter was the goal selected here. Can choose up to 3 goals.



Ranks for the goal selected, now sorted by rank



Grayed-out area reminds you of your current cash crop

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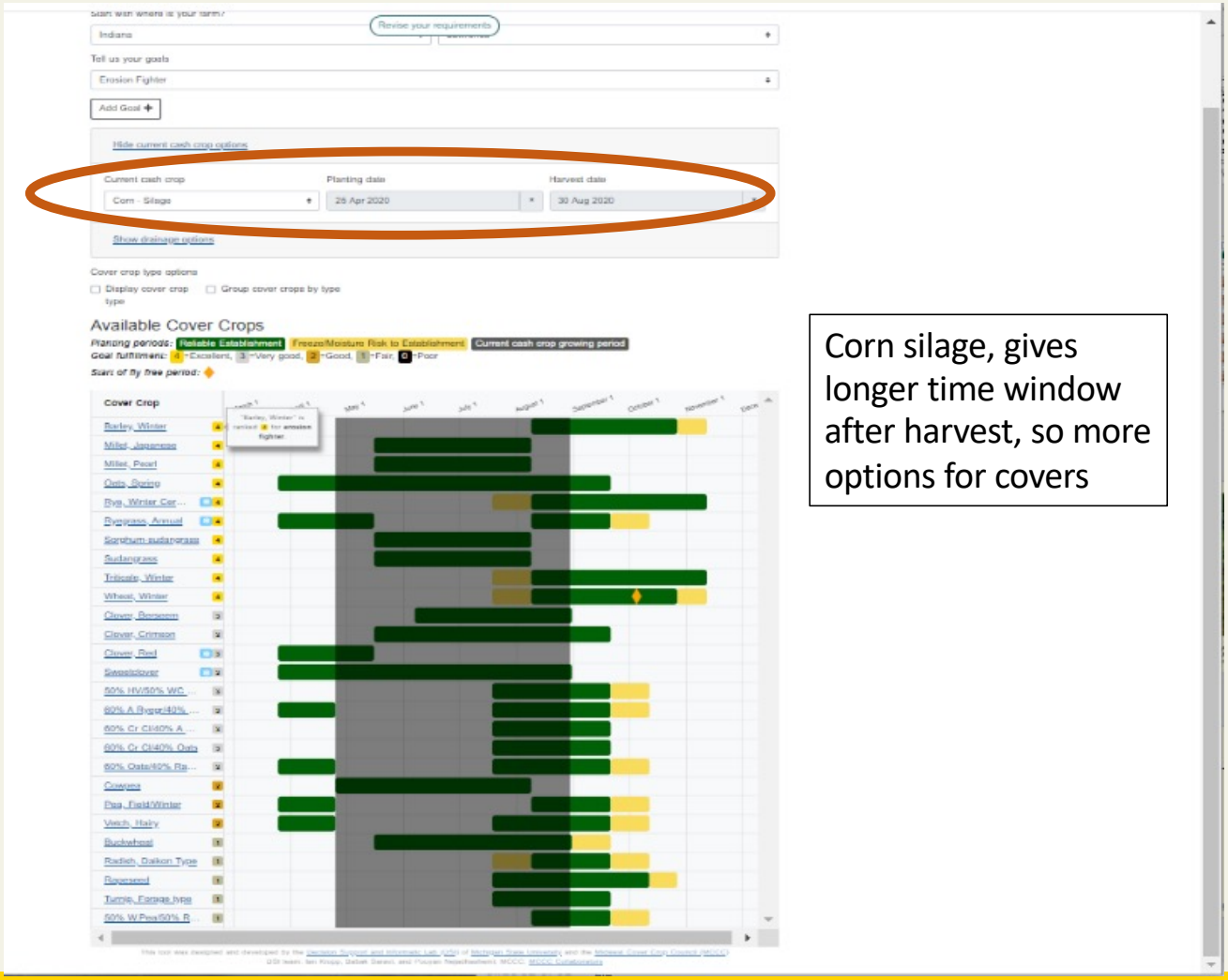

Corn silage, gives longer time window after harvest, so more options for covers

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April 1st

Steuben Co., IN

November 9th

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Posey Co., IN

November 29th

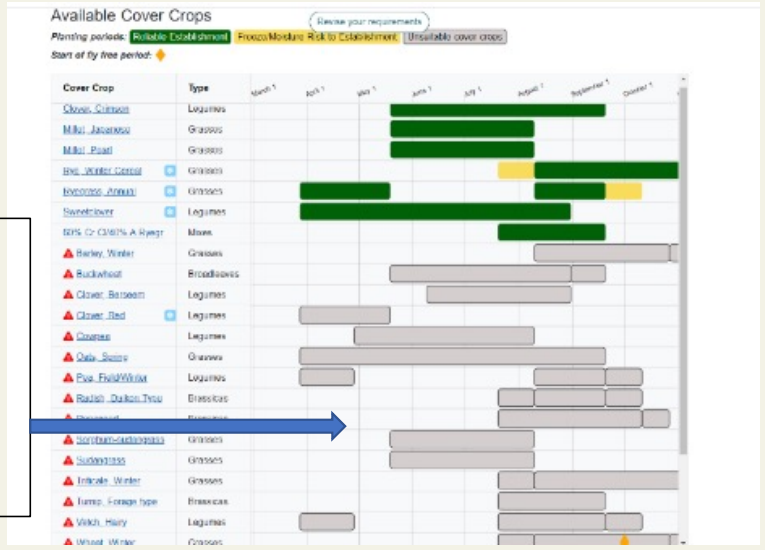
MCCC Cover Crop Decision Tool

www.midwestcovercrops.org

Parke Co., IN

Poorly-drained soil, no tile

Note most cover crops are “grayed out”, ie unsuitable



Poorly-drained soil, with tile

Note most cover crops are now suitable to grow.
(Green is reliable seeding dates)

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Cover Crop Information Sheet

Considerations for using 60% Oats/40% OSR in Indiana

There are no special considerations

Web links to information on using Cover Crops in Indiana can be found at: http://mccc.msu.edu/states/Indiana.html

Location Information

Location:	Indiana - All Counties Average
Cash Crop:	None or Prevented Planting
Plant Date:	None
Harvest Date:	None
Soil Drainage Class:	None
Artificial Drainage:	No
Flooding:	No

Cover Crop Selection Information

Cover Crop Selected:	Mix of 60% Oats/40% OSR
Cover Crop Attribute #1:	None
Cover Crop Attribute #2:	None
Cover Crop Attribute #3:	None
Use within the State:	Common

Planting Information

Drilled Seeding Depth:	½-1	Inches	
Drilled Seeding Rate:	18-36	lb./A PLS	Oats
Drilled Seeding Rate:	2-4	lb./A PLS	Radish, Oilseed
Broadcast Seeding Rate:	19.8-39.6	lb./A PLS	Oats
Broadcast Seeding Rate:	2.2-4.4	lb./A PLS	Radish, Oilseed
Aerial Seeding Rate:	21.6-43.2	lb./A PLS	Oats
Aerial Seeding Rate:	2.4-4.8	lb./A PLS	Radish, Oilseed
Seed Count:	19,600	Seeds/lb.	Oats
Seed Count:	34,000	Seeds/lb.	Radish, Oilseed
Frost Seed:	No		
Fly-Free Date:	No		
Inoculation Type:			
Comments:			

Termination Information

Termination Methods:	Freeze
Comments:	

Performance and Roles

Legume Nitrogen Source:	No	
Total Nitrogen:	10-60	(lb./A)
Dry Matter:	1700-5500	(lb./A/yr.)
Nitrogen Scavenger:	Excellent	
Soil Builder:	Very Good	
Erosion Fighter:	Good	
Weed Fighter:	Very Good	

Cultural Traits

Scientific Name:	Avena sativa	Oats
Scientific Name:	Raphanus sativus	Radish, Oilseed
Life Cycle:	Cool Season Annual	Oats
Life Cycle:	Cool Season Annual	Radish, Oilseed
Growth Habit:	Upright	Oats
Growth Habit:	Upright	Radish, Oilseed
Preferred Soil pH:	6.0-6.5	
Min. Germination Temp.:	45F	
Heat Tolerance:	Fair	
Drought Tolerance:	Fair	
Shade Tolerance:	Fair	
Flood Tolerance:	Fair	
Low Fertility Tolerance:	Fair	
Winter Survival:	Seldom	
Comments:		

Potential Advantages

Soil Impact - Subsoiler:	Very Good
Soil Impact - Frees P and K:	Good
Soil Impact - Loosens Topsoil:	Very Good
Soil Ecology - Nematodes:	Very Good
Soil Ecology - Disease:	Good
Soil Ecology - Allelopathic:	Very Good
Soil Ecology - Choke Weeds:	Excellent
Other - Attract Beneficials:	Fair
Other - Bears Traffic:	Good
Other - Short Windows:	Excellent
Comments:	

Potential Disadvantages

Delayed Emergence:	Rarely a problem
Increased Weed Potential:	Rarely a problem
Increased Insects/Nematodes:	Occasionally a minor problem
Increased Crop Diseases:	Rarely a problem
Hinders Crops:	Rarely a problem
Establishment Challenges:	Rarely a problem
Till Kill Challenges:	Could be major problem
Mow Kill Challenges:	Could be major problem
Mature Incorporation Challenges:	Rarely a problem
Comments Pro/Con:	

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Seeding Rate Calculator

- Straightforward seeding rate calculator for complex mixes
- Default seeding rates will be suitable for less experienced growers
- Seeding rates are highly customizable
- Intended to be a learning tool
- In partnership with NRCS, to evaluate for cost share

~draft version is being reviewed by MCCC team~

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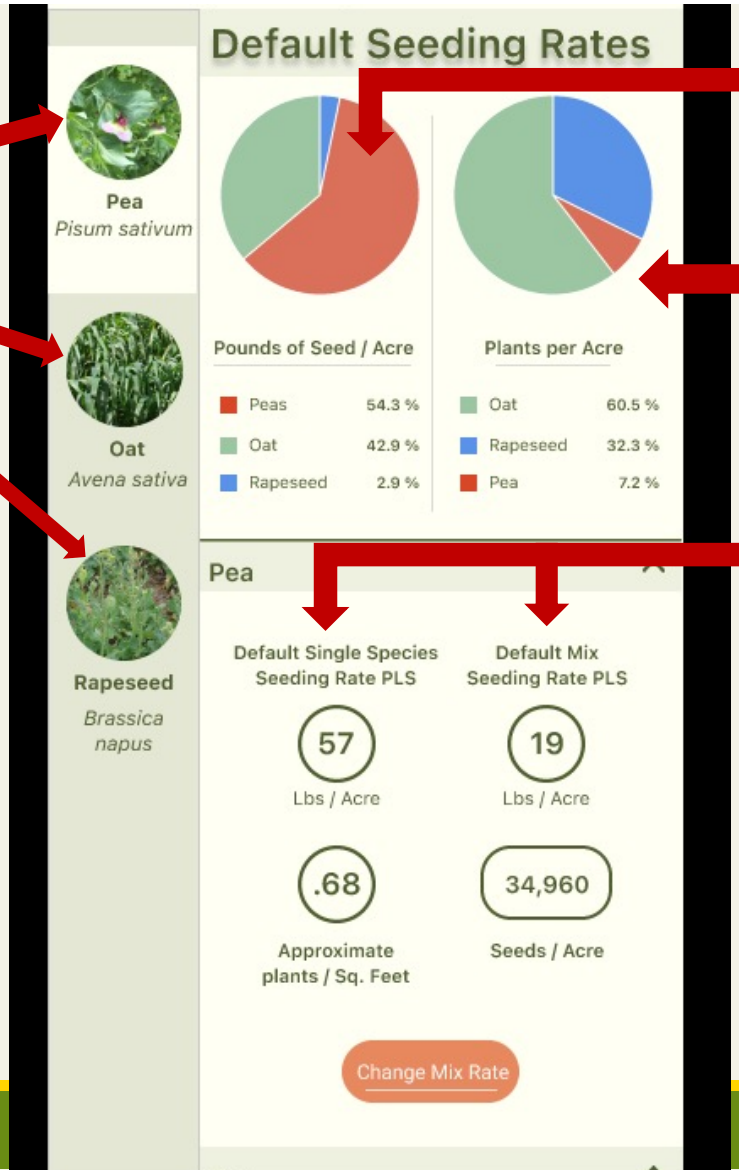
3-Way Mix

Pea

Oat

Rapeseed

Mobile and desktop versions



lbs seed /acre

live plants/acre

Default mix seeding rate

<u>single species rate</u>

number of species

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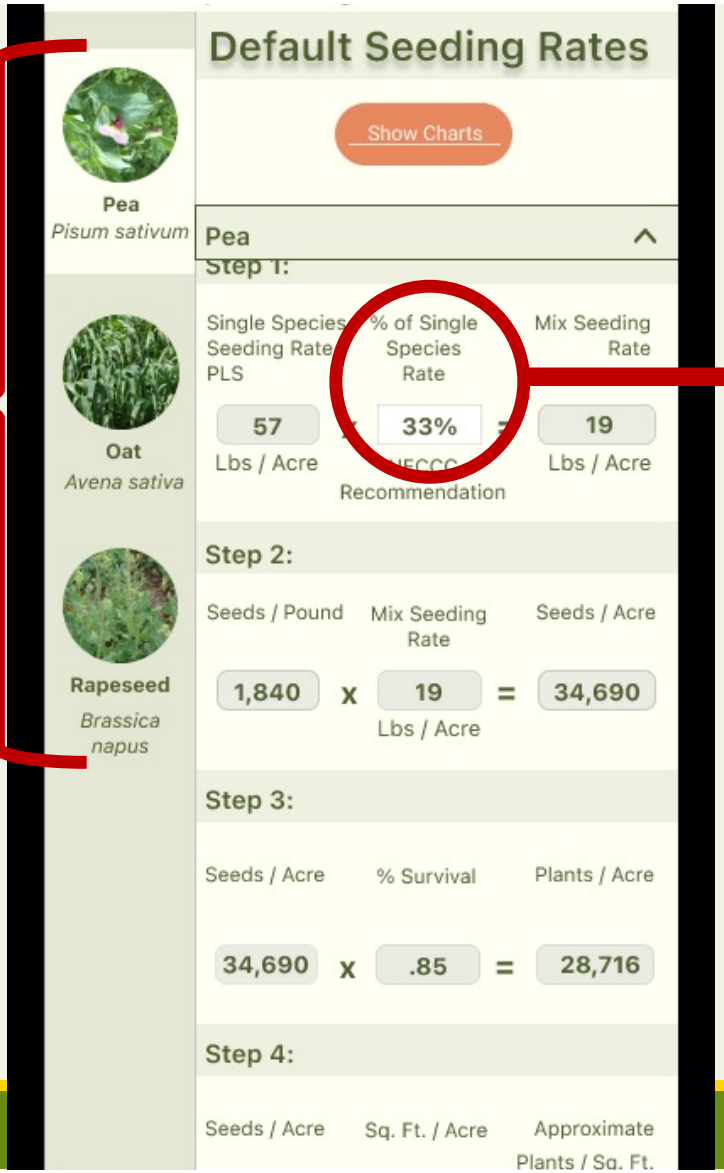
3 Way Mix



Single species seeding rate divided into thirds

Adjustable by user

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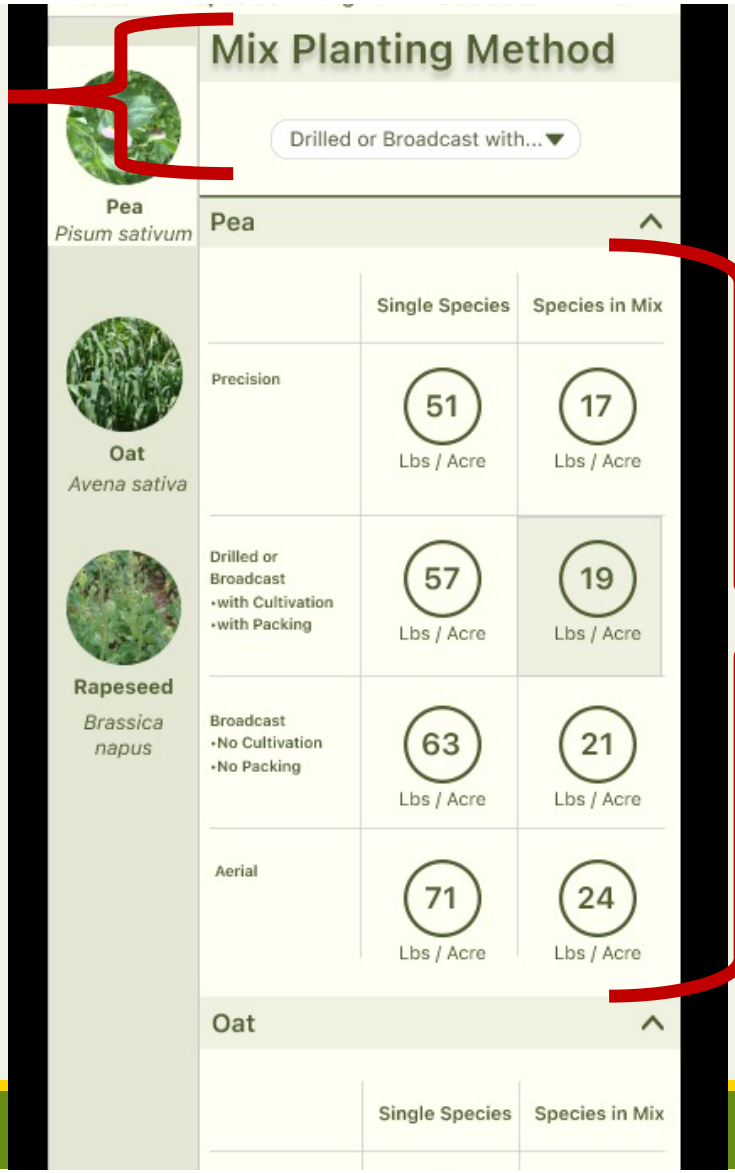
Seeding rate adjusted by planting method



Users learn that less precise planting methods require higher seeding rates

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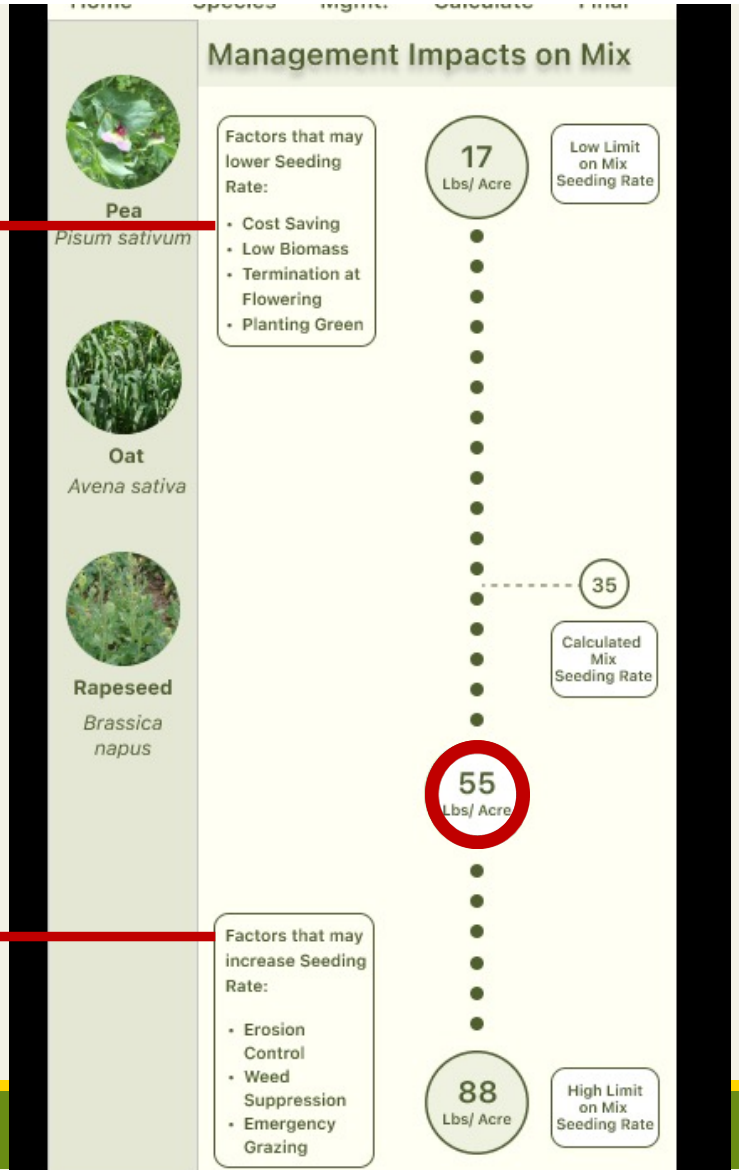
Education: Factors to decrease rate

Factors to increase rate



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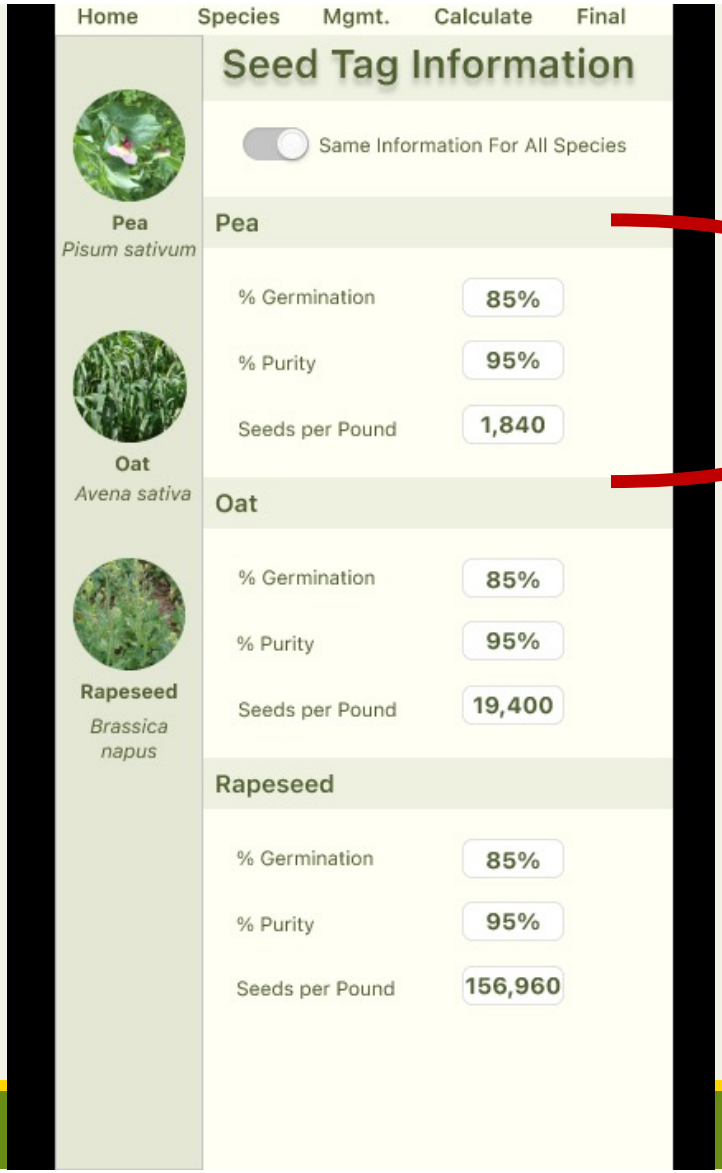

Seed tag information is populated with default values, but modifiable by user

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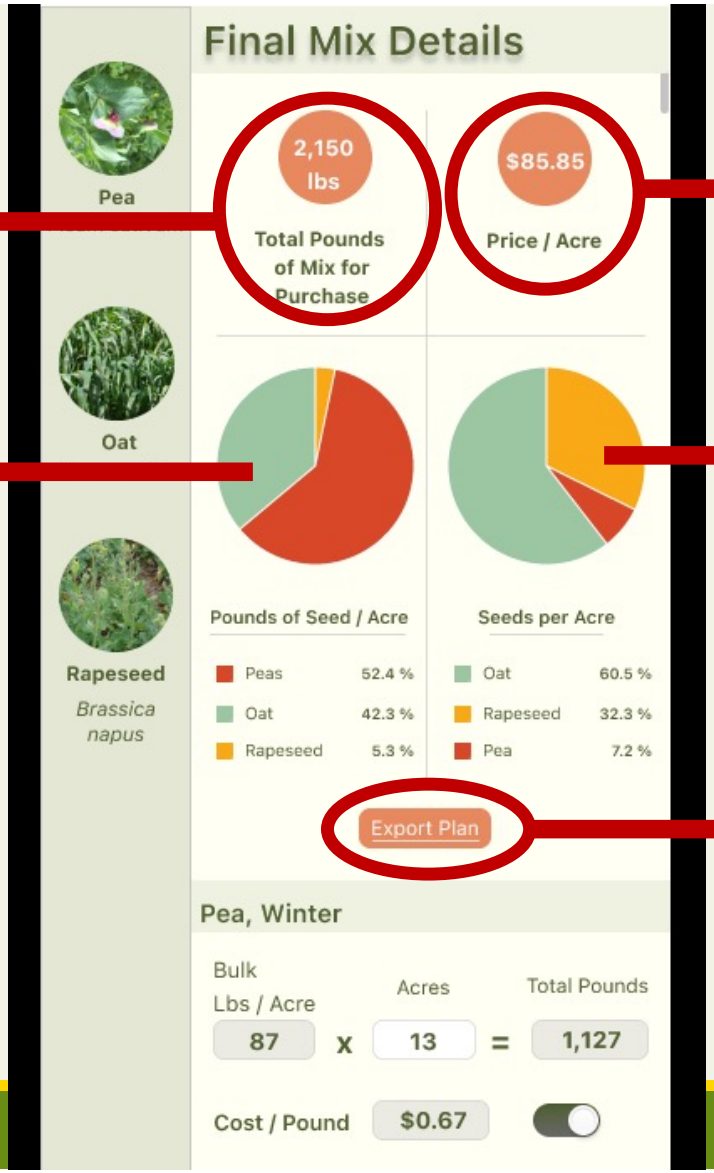
Total pounds of bulk seed

lbs seed/acre

Mix cost /acre
(price is user input)

Plants/acre

Users can export the mix to take to advisor/NRCS or plan for next year



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Coming soon - Crop Advisor Modules

- Series of 10 modules designed for crop advisors
- Powerpoint presentations available for download and use
- Covers topics like soil health, establishment, pests, and economics
- MCCC will host these modules as webinars presented by our experts

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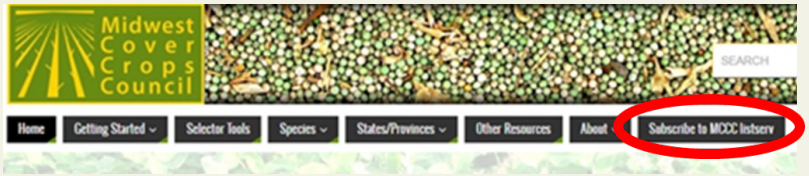
Join us at CTC in Ohio 2022!



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2022 Annual Meeting and Conference

March 7-9, 2022

In partnership with CTC in Ada, OH

Registration opens in January

Join our Listserv and

Follow us on Facebook and Twitter for details

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Questions

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