



# Cover Crop Basics and Termination

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# Cover Crop

USDA NRCS Code 340

## Definition

Grasses, legumes, and forbs planted for seasonal vegetative cover.

## Purposes

- Reduce erosion.
- Maintain or increase soil health and organic matter content.
- Reduce water quality degradation by utilizing excessive soil nutrients.
- Suppress excessive weed pressures and break pest cycles.
- Improve soil moisture use efficiency
- Minimize soil compaction.

Photo by Elli Blaine



# Buckwheat



*Photo: Marian Rodriguez-Soto*



# Sunn hemp



*Photo: Liz Maynard and Marian Rodríguez-Soto*



# Oats

*Photo: Kevin Allison*

A close-up photograph of hairy vetch plants. The image shows several stems with bright purple flowers and green, feathery leaves. The background is a clear blue sky with some light clouds. The text "Hairy vetch" is overlaid in white on the left side of the image.

# Hairy vetch

*Photo: Elli Blaine*

A close-up photograph of a bumblebee on a crimson clover flower. The bee is positioned on the right side of the frame, facing left, and is actively foraging on the red, elongated flower head. The flower is in sharp focus, while the background is a soft-focus field of similar flowers and green leaves. The text 'Crimson clover' is overlaid on the left side of the image in a white, sans-serif font.

# Crimson clover

*Photo: Elli Blaine*



# Cereal rye

*Photo: Eli Blaine*



## Why use cover crops?

- Increase soil health and decrease compaction
- Suppress weeds
- Soil cover between in gaps between vegetable crops
- Enhance the next crop
  - Nutrients, soil health, mulch, tilth



*Cover crop suppressing weeds after sweet corn*



*Legume providing nitrogen to next crop*



*Soil health and compaction*

Photograph by Xueming Yang





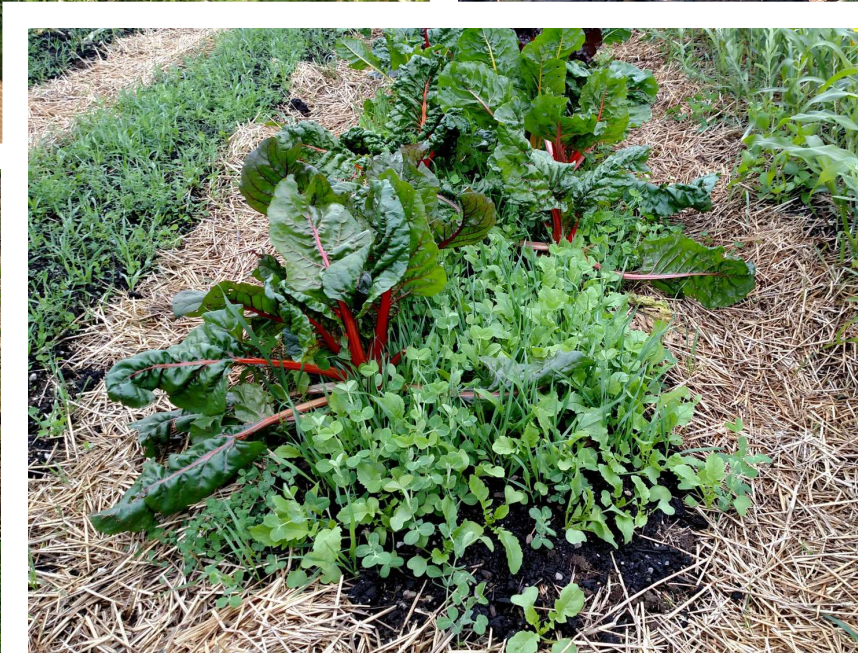








# Raised Beds







frithfarm • Following

1. Carefully mark out then till the area where you want beds. Yes, I wrote 'till' in a post about no-till...this is a one-time tillage to form your raised beds. From here on out there will be no soil disturbance. It's also a final opportunity to mechanically incorporate soil amendments (according to soil test recommendations).
2. Raised beds are formed by making a pass up and down each path with the rotary plow on a BCS walk-behind tractor.
3. Black tarps (5-mil polyethylene silage tarps) are spread to smother perennial grasses. It takes us about 2 months of summer tarping to fully kill our sod, which is oh-so-important to do before proceeding. The time it takes you will vary with temperature and with the species you are trying to smother.
- 4-6: Once all perennial roots are fully dead, we pull off the tarps and fill the paths with wood chips (or leaves or straw) and spread a 3" layer of compost over the beds.
7. The compost is raked out with care so that it fully covers every bit of soil. "Never see the soil" is a mantra here.
- 8-10: The new beds are seeded to inoculated cover crop with an Earthway. We use a fall cocktail that will winterkill (oats, barley, peas, fava, crimson clover) so we can rake off the dead cover crop debris and direct seed or transplant into the beds the following spring.

And ba-ta-bing ba-ta-boom...we have joined the dance of soil life!

#notillfarming #notill #notillgardenina #notillmarketgardenina

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## Using cover crops to improve soil health and erosion control on new gardens

Photo credit: <https://www.instagram.com/frithfarm/>

# Steps for Cover Crop Establishment

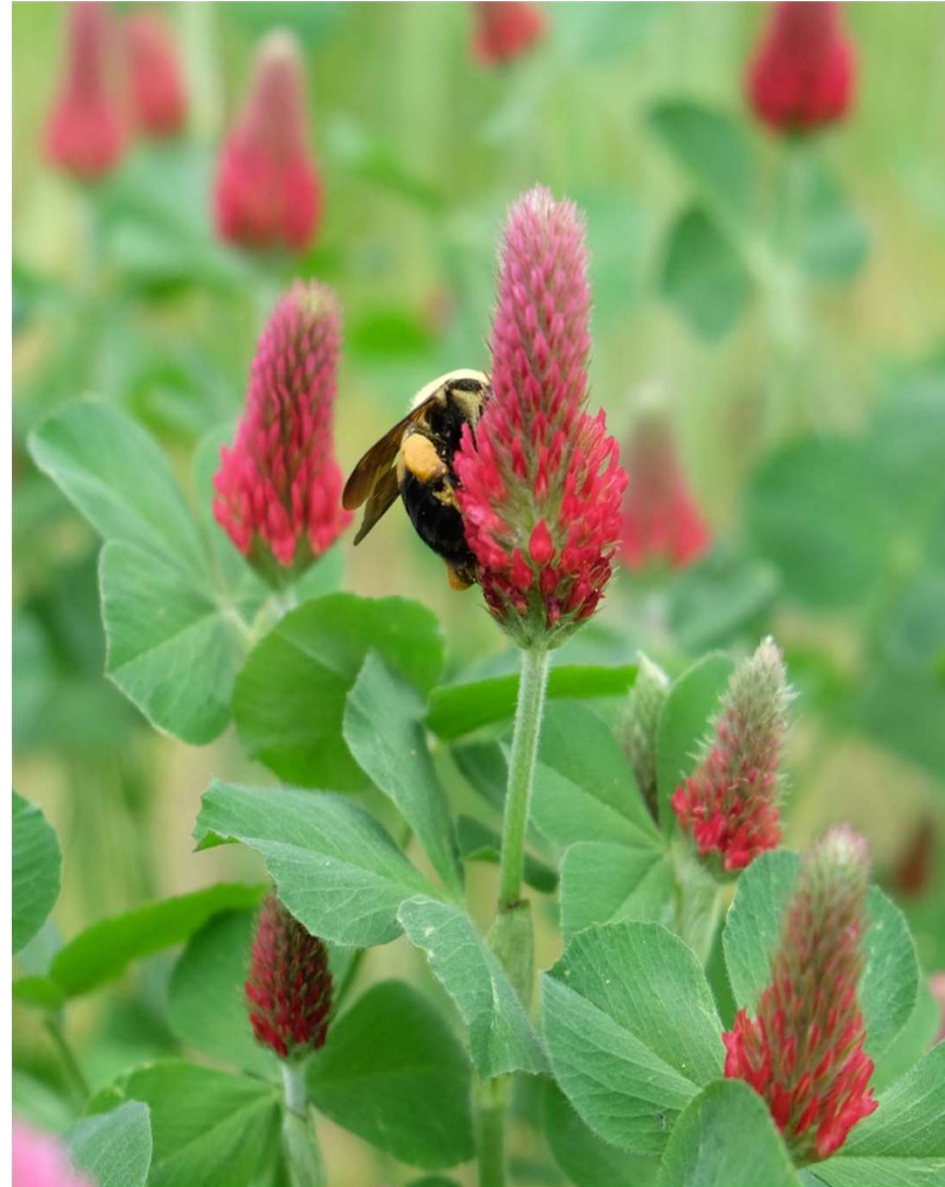
- Step 1: Eliminate weeds
- Step 2: Manage residue
- Step 3: Plant Cover Crop
- Step 4: Firm bed and Mulch if needed
- Step 5: Rain, Water, Irrigate

\*Farmer methods may vary greatly and is dependent on tools and context.



# Cover Crop Seeding Methods

- Broadcast
- Broadcast with incorporation
- Direct seed with row seeders
- Direct seed using furrowers
- Inter-seeding
- Moisture Management
- Weed Management



# Broadcast

- Spreading the cover crop seed over an area (by hand or with a seed spinner)
- Potential for low seed to soil contact, patchy and uneven germination, but useful in high residue situations where other methods aren't practical.
- Refer to "Surface Broadcast Potential" column on table for broadcast feasibility for each cover crop species
- Firming the bed, irrigation, and/or light mulch can increase success
- ½ layer of compost or mulch add on top of seeding can increase success

Species	Type	Min. Germ Temp	Optimum Depth (inches)	Surface Broadcast Potential
Barley	Grass	35F	¾-1½	+
Buckwheat	Nonlegume Forb	50F	½-1	-
Clover, White/Dutch/Ladino	Legume	42F	¼-½	+
Clover, Balansa	Legume	42F	¼-½	+
Clover, Berseem	Legume	42F	¼-½	+
Clover, Crimson	Legume	42F	¼-½	+
Clover, Red	Legume	41F	¼-½	+
Hemp, Sunn	Legume	68F	½-1½	-



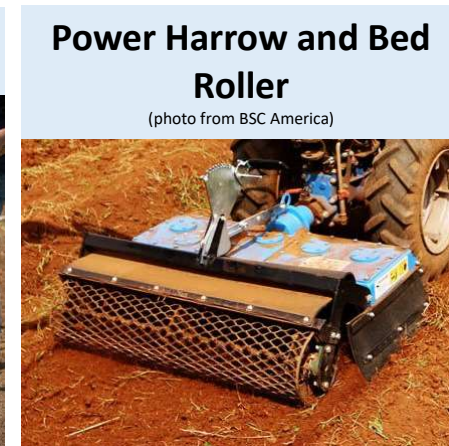
## Broadcast with incorporation

- Spreading seed over an area and then using a tool to bury the seed to the desired depth
- Results in better seed to soil contact resulting in more consistent germination
- Refer to the NRCS Cover Crop Table for optimum seeding depths
- Adding a layer of compost to the area may decrease the depth of native soil disturbance

Species	Type	Min. Germ Temp	Optimum Depth (inches)	Surface Broadcast Potential
Barley	Grass	35F	¾-1½	+
Buckwheat	Nonlegume Forb	50F	½-1	-
Clover, White/Dutch/Ladino	Legume	42F	¼-½	+
Clover, Balansa	Legume	42F	¼-½	+
Clover, Berseem	Legume	42F	¼-½	+
Clover, Crimson	Legume	42F	¼-½	+
Clover, Red	Legume	41F	¼-½	+
Hemp, Sunn	Legume	68F	½-1½	-

### Common tools:

- Rake
- Rotary cultivator
- Tilter
- Power harrow with bed roller or rolling basket
- Tiller with bed roller or rolling basket
- Bed roller provides depth control and firms the bed



## Direct Seed using Row Seeders

- Direct seed to soil contact, refer to cover crop table for optimum seeding depth
- [“Using Manually – Operated Seeders for Precision Cover Crop Plantings on the Small Farm”](#) document for Earthway seeders or manufacturer standards
- Some growers might broadcast small seed and then direct seed large seed on same bed.
- Can be inefficient in hard or compacted soils. Shallow seedbeds or furrows are often prepared prior to direct seeding.
- Adding a light layer of compost can allow for direct seeding without disturbance.





## Row Seeders

- Residue considerations
- Bed firmness considerations

# Direct Seeding using Furrowers

1. Furrow
2. Seed Cover Crop (by hand or row seeder)
3. Cover and Firm

**Warren Hoe or Pointed Hoe**



**Garden Bed Ridger**

(photo from GarrettWade.com)



**Wheel Hoe Ridger or Plow**





# Interseeding

- Increase time for photosynthesis, roots, and biomass.
- Good attributes may be tolerance of shade, low moisture, and low fertility
- Growing cover crops simultaneously as crops can have poor crop results but is not impossible.
  - Air flow, water, nutrients, spacing.
- Interseeding into mature crops is more common
- Will an interseeded cover crop impact your harvesting?



# Moisture Management for Cover Crop Seedings

- Best practice is to keep bed moist through cover crop germination
- One good rain is advantageous
- A light layer of straw or other mulch on top of the cover crop seeding can help conserve moisture
- Seed to soil contact is key



# Weed Management during Cover Crop Growth

- Cover crops may not suppress 100% of weeds
- Scout for weeds
  - Spot weed by pulling or hoeing
  - Perennials can often be pulled. Low lying annuals can often be lightly hoed.
  - Can be labor intensive, depending on weed pressure
  - Patch bare spots with mulch
  - If weeds are a major issue and cannot be sufficiently weeded, consider terminating the cover crop early to prevent the development and spreading of weed seed.
  - System and weed pressure should improve over time.
  - Tactics such as stale seed bedding, tarping, zero seed rain, and other weed management methods can pair with cover crops to more fully manage weeds.





## Termination Methods

Tillage

Chemical

Winterkill

Mow or Cut

Crimp

Tarp or Solarization

Combinations

# Tillage



- Incorporates the cover crop as a “green manure”
- May require multiple passes
- Wait 20 days for allelopathy and system balance
- High biomass mixes may be difficult for some equipment
- Growth stage matters
- Mowing first can facilitate incorporation, especially with less powerful incorporation tools



# Chemical

- Ensure herbicides used with crops are compatible with cover crop selections and purpose(s).
- Consider previous herbicide applications for potential carryover when selecting the species of the cover crop.
- NRCS does not make herbicide recommendations.
- <https://www.extension.purdue.edu/extmedia/ws/ws-50-w.pdf>

**PURDUE UNIVERSITY** **PURDUE EXTENSION** WS-50-W  
**TERMINATING COVER CROPS**

## Successful Cover Crop Termination with Herbicides

Authors:  
Travis Legleiter  
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Tom Jordan  
Kevin Gibson

**PURDUE WEED SCIENCE**  
www.ag.purdue.edu/btny/weedscience

**EXPERT REVIEWED**  
Photos by  
Corey Gerber  
Purdue Extension

Cover crops have become a major topic for producers who want to capitalize on government conservation payments and incorporate sustainable agriculture practices into crop production acres. Cover crops can decrease soil erosion, enhance soil quality and nutritive value, and help improve air and water quality. Cover crops are unique in that most are planted primarily for these benefits and are not harvested for their seed, fruit, or forage (some are partially grazed or used as forage). Instead, cover crops are terminated before planting production crops.

Those who would like to use cover crops in their production systems have many factors to consider including how the cover crop will be terminated. If not terminated properly, cover crops have the potential to become weeds in the production crop and can slow soil drying and warming in the spring. Many cover crop species have characteristics that make them both desirable as cover crops and troublesome weed species. Weedy cover crop escapes not only affect the current production crop, but also can produce seeds and establish a seed bank that will produce future weed problems.


This publication describes how producers can effectively terminate cover crops with herbicides to prevent them from becoming weeds in production crops.

**Termination Methods**  
The four common methods of terminating cover crops are: winterkilling, tilling, mowing, and applying herbicides.

Oats can be an effective cover crop.

Each method has its disadvantages and limits. For example, winterkill (the cover crop is terminated by a hard freeze) is only applicable to certain crops and climate regions; mowing is limited to certain cover crops and crop growth stages. Tillage can be expensive and can negate the benefits of the cover crops, as well as the benefits of minimum/no-till production systems. Many factors also limit herbicides — and they may be completely prohibited in organic cropping systems. When selecting an herbicide program for termination of a cover crop, consider:

- The cover crop species.
- The cover crop growth stage.
- Other weed species present.
- The production crop to be planted.
- The weather conditions at application.
- The type of herbicide used.



# Winterkill or Freeze



**Winterkilled**



**Overwintering**



# Mow or Cut

BSC Flail Mower



Sickle

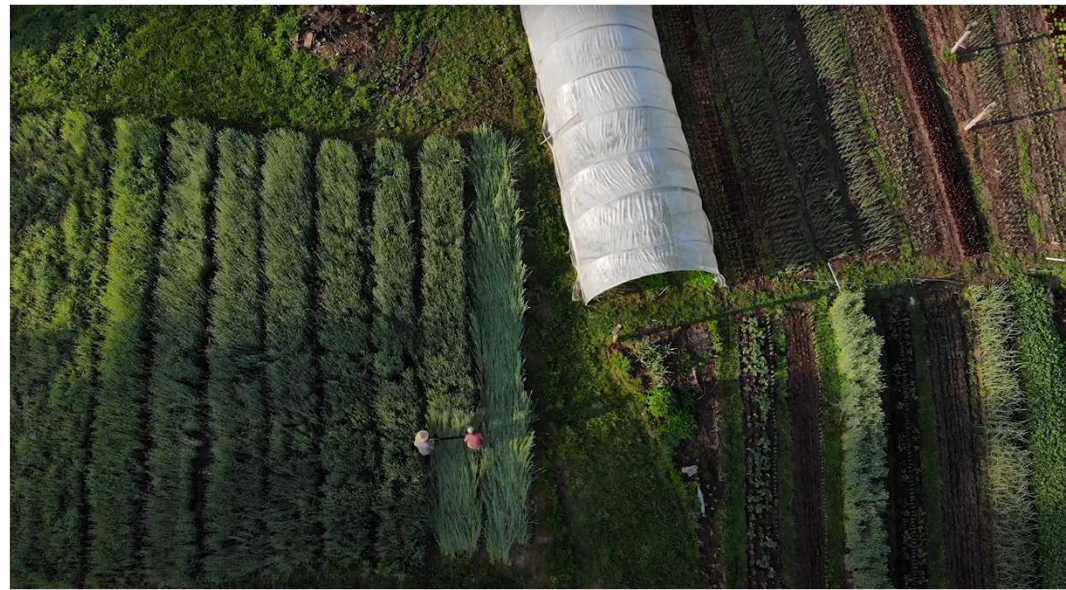


- Most effective on annual legumes and tender cover crops like buckwheat
- Most effective at flowering stage
- Cover crop survival is likely; a tarp or heavy mulch to fully terminate is needed.
- If mowing, some hardy cover crops require high powered equipment to successfully terminate
- Option: Mow, wait a week or two, and mow again

# Crimp



- Most effective on grasses
- Most effective at flowering or anthesis stage
- Legumes are hard to crimp without serious weight / pressure



# Mow / Cut versus Crimp - Decomposition



Crimped  
Longer lasting residue

Mowed  
Quicker decomposition

*Mowed cover crop (top left)*

*Planting into a crimped cover crop (bottom left)*

*Crimped vs mowed cover crop (right)*

## Mow / Cut versus Crimp - Example



*Sweet Potatoes transplanted into mowed and tarped cereal rye (left)*

*Sweet Potatoes transplanted into crimped and tarped cereal rye (right)*

# Mowing, Cutting, and Crimping without additional measures

- Termination success is dependent on timing
  - Early = Poor termination or cover crop regrowth
  - Just Right = Flower, milk stage, dough stage
  - Late = Cover crop seed set and weeds
- Cover crop mixes with multiple bloom times can present challenges.
- Does not effectively kill weeds
- Crimping = more effective on grasses
- Mowing or cutting = more effective on legumes
- Additional Measures: Tarping, Solarization

*Crimson clover blooming before hairy vetch (top)  
Cereal rye and Hairy vetch flowering stage (bottom)*



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*Hairy vetch (legume) regrowth after crimping (top)*  
*Cereal rye (grass) regrowth after cutting too early (bottom)*



# Tarps - Occultation



- Supplement to crimping or mowing to ensure full termination of cover crop and weeds
- 3 to 4 weeks in spring but less in summer
- Duration of tarping needed depends on temperature and species vigor
- Effective against 14 out of the top 16 weeds.
- Some weeds germinate under the tarp and die. Purslane and crab grass need light to germinate.
- <https://extension.umaine.edu/publications/1075e/>



# Solarization



- Supplement to crimping or mowing to ensure full termination of cover crop and weeds
- Uses intense heat to terminate plants
- Not as effective on grasses like cereal rye
- Quicker than tarping / Can be completed in a couple sunny days with temps above 80 degrees
- Solarization attempts in cool weather result in more vigorous weeds because of greenhouse effect
- Duration needed to terminate depends on temperature and species vigor
- Long periods of solarization can be detrimental to soil health

# Mulching



*Kale transplanted into mowed crimson clover plus a layer of newsprint and straw*



*Mowed hairy vetch covered in straw*

- Occultation: Block the light
- Supplemental to other methods
- This isn't cut and paste. Depends on specie vigor, growth stage, type, and thickness of mulches

## Choosing a Cover Crop and Designing Mixes

- What is your goal?
- When and how do you want to plant your next crop?
- How do you want your bed to look when you plant the next crop?
- Choose a compatible cover crop mix and termination method.
- Will that termination method create a plantable bed?
- Examples include:

**Tillage resulting in “green manure” and prepared seedbed**



**Transplanting into crimped high biomass cover crop**

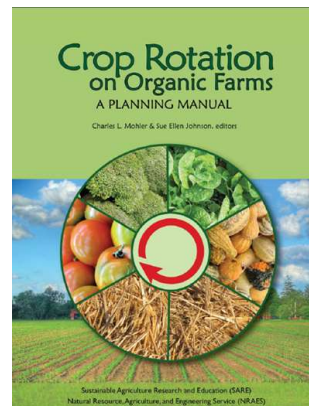
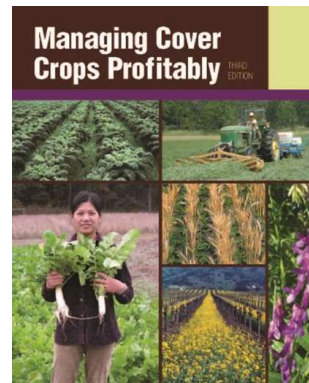


**Winterkilled, raked away, and layer of compost**



# Resources

- SARE Books
- NRCS Documents
  - Seeding Windows
  - Cover Crop Table
  - Create a Mix
  - Seeding Methods



## Seasonal Chart for Indiana Fresh Produce

	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
<b>VEGETABLES</b>												
asparagus												
beet												
broccoli												
Brussel sprouts												
cabbage												
carrot												
cauliflower												
cucumber												
eggplant												
green pea												
kale, collard greens												
kohlrabi												
lettuce (leaf)												
onion (bulb)												
onion (green)												
peppers (hot and sweet)												
potato												
pumpkin												
radish												
snap bean												
spinach												
summer squash												
sweet corn												
sweet potato												
tomato												
turnip and turnip greens												
winter squash												
<b>FRUIT</b>												
apple												
blackberry												
blueberry												
cherry												
grape												
melons (cantaloupe, watermelon)												
peach												
pear												
raspberry												
strawberry												

■ harvest season   
 ■ extended season   
 ■ storage season

## SEEDING WINDOWS FOR COVER CROPS IN INDIANA

**NOTE:** Northern and southern Indiana seeding dates for the tables below are divided on a general line along US 36 from Illinois to Indianapolis and US 40 from Indianapolis to Ohio.

**Best window of opportunity and greatest benefit for various cropping scenarios**

■ After harvest  
■ Aerial or interseed

■ A/I after corn  
■ A/I after soybeans  
■ after seed corn  
■ after silage corn  
■ after vegetable crops

■ after wheat  
■ after early veg crops

Plant Species	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec-Feb.
Barley, Winter						N	IN	IN	IN	R
Buckwheat			S	IN	IN	IN	IN	IN	R	
Clover, Balansa	R-2	IN	IN			IN	IN	IN	IN	
Clover, Berseem				IN	IN	IN	IN	S		
Clover, Crimson			S	IN	IN	IN	IN	IN	R	
Clover, Red	R-2	S	IN	IN	IN					F-2
Collards	R	S	IN	IN	IN	M	M	M	IN	R
Cowpea/Soybeans			S	IN	IN	IN	M	3		
Flax	R	IN	IN			M	IN	IN		
Kale	R	S	IN	IN	IN	M	M	IN	IN	R
Millet, Japanese/Pearl			S	IN	IN	IN	IN	3		
Oats, (Spring & Black)	R-2	S	IN	IN	IN	M	M	M	IN	3
Pea, (Field/Spring/Winter)	R-2	S	IN	IN	N		N	IN	IN	R
Phacelia	R	IN				M	IN	IN	IN	R
Radish, Oil Seed						M	IN	IN	R	
Rapeseed						M	IN	IN	IN	IN
Rye, Winter Cereal	R-2					N	IN	IN	IN	IN
Ryegrass, Annual	R-2	S	IN	IN	IN	N	IN	IN	IN	R
Sorghum-Sudangrass /Sudangrass /Milo				IN	IN	IN	IN	IN-3	S-3	
Soybean, (Forage & Field)			S	IN	IN	IN	IN	IN-3	S-3	
Sunflowers			S	IN	IN	IN	IN	S		
Sunn Hemp			S	IN	IN	IN	S			
Teff (Coated Seed)			S	IN	IN	IN	M	M	S-3	
Triticale, Winter						N	IN	IN	IN	IN
Turnips/Pasja	S-4	IN-4	IN-4			M	IN	IN	IN	R
Vetch, Hairy		S	IN			IN	IN	IN	IN	S
Wheat, (Winter & Spelt)						R-1	R-1	R-1	R-1	IN

<sup>1</sup> Risk for Hessian Fly-Free Dates Recommended

<sup>2</sup> Dormant/Frost/Early seeding from December thru March. Increase seeding rates by 25%.

<sup>3</sup> Expect lower biomass and production

<sup>4</sup> Bolting risk

### Legend

- Suitable seeding dates for all of Indiana
- Additional suitable seeding dates for Southern IN (~South of I-70)
- Additional suitable seeding dates for north Northern IN (~North of I-70)
- Riskier Establishment (Season/Weather/Variety Dependent)
- Frost/Dormant Seeding
- IN-3 Dwindling quantity
- M If sufficient moisture

Seeding window is part of the IN NRCS Cover Crop Seeding Calculator which can be found on the Field Office Tech Guide (FOTG) and downloaded [HERE](#)

# Indiana Cover Crop Table for Small Farms and Gardens



Species	Type	Life Cycle	Winter Survival	Termination Methods					Growth Height	C:N at Maturity
				Freeze	Tillage	Mow Cut	Crimp <sup>2</sup>	Tarp		
Barley	Grass	Winter Annual	Expected		•	•	•	•	Medium-Tall	30:1
Buckwheat	Nonlegume Forb	Summer Annual	Never	•	•	•		•	Medium	20:1
Clover, White/Dutch/Ladino	Legume	Short-Lived Perennial	Expected		•			•	Short	15:1
Clover, Balansa	Legume	Cool Season Annual	Expected		•	n/a	n/a	•	Short	15:1
Clover, Berseem	Legume	Summer Annual	Never	•	•			•	Short	15:1
Clover, Crimson	Legume	Winter Annual	Expected		•			•	Short	15:1
Clover, Red	Legume	Short-Lived Perennial	Expected		•			•	Short	15:1
Hemp, Sunn	Legume	Summer Annual	Never	•	•	•	n/a	•	Tall	20:1
Kale	Brassica	Cool Season Annual	Seldom or Expected <sup>1</sup>		•			•	Medium	19:1
Millet, Japanese	Grass	Summer Annual	Never	•	•			•	Tall	48:1
Millet, Pearl	Grass	Summer Annual	Never	•	•			•	Tall	48:1
Oats	Grass	Cool Season Annual	Seldom	•	•	•		•	Medium-Tall	30:1
Pea, Field	Legume	Winter Annual	Rarely	•	•	•		•	Medium-Tall	25:1
Pea, Winter	Legume	Winter Annual	Seldom		•	•		•	Medium-Tall	25:1
Pea, Cow	Legume	Summer Annual	Never	•	•	•		•	Medium-Tall	20:1
Phacelia	Nonlegume Forb	Cool Season Annual	Seldom	•	•	n/a	n/a	•	Medium	25:1
Radish (Oil Seed)	Brassica	Cool Season Annual	Seldom	•	•			•	Medium	19:1
Rapeseed	Brassica	Winter Annual or Cool Season Annual	Seldom or Expected <sup>1</sup>		•			•	Medium	19:1
Rye, Winter Cereal	Grass	Cool Season Annual	Expected		•	•	•	•	Medium-Tall	37:1
Ryegrass, Annual	Grass	Winter Annual	Seldom or Expected <sup>1</sup>		•			•	Medium	25:1
Sorghum-sudangrass	Grass	Summer Annual	Never	•	•			•	Tall	52:1
Soybean	Legume	Summer Annual	Never	•	•	•		•	Medium	35:1
Sudangrass	Grass	Summer Annual	Never	•	•			•	Medium	50:1
Sunflower	Nonlegume Forb	Summer Annual	Never	•	•	•		•	Tall	35:1
Triticale, Winter	Grass	Winter Annual	Expected		•	•	•	•	Medium-Tall	35:1
Turnips / Pasja	Brassica	Cool Season Annual	Seldom	•	•			•	Medium	19:1
Vetch, Hairy	Legume	Winter Annual or Cool Season Annual	Expected		•	•	•	•	Medium	11:1
Wheat, Winter	Grass	Winter Annual	Expected		•	•	•	•	Medium-Tall	35:1

<sup>1</sup>Variety Dependent

<sup>2</sup>Crimping only may not fully terminate legumes

# Indiana Cover Crop Table for Small Farms and Gardens



Species	Type	Min. Germ Temp	Optimum Depth (inches)	Surface Broadcast Potential	Seeding Rate (Oz/100 sq.ft.)			General Guidelines for Seeding Rates and Mixes
					Low	Normal	High	
Barley	Grass	35F	¾-1½	+	1.6	3.2	6.4	<p>Rates are based on the seeding method of broadcast plus light incorporation. Rates are provided in ounces (weight) per 100 square feet. Normal rate is based on a single species 100% canopy cover in optimum/average conditions. Low rate is half of the normal rate. High rate is double the normal rate.</p> <ul style="list-style-type: none"> <li>▪ Increase rates as you move to a seeding method that is less assured of good seed to soil contact.</li> <li>▪ Increase rates if a primary purpose is weed control.</li> <li>▪ Increase rates as you reach the end of the optimum seeding window.</li> <li>▪ Increase rates as you move north due to fewer days to achieve desired biomass.</li> <li>▪ Increase rates if you plan to terminate a cover crop earlier than maturity.</li> <li>▪ Decrease rates as you increase soil fertility.</li> <li>▪ Decrease rates as you move to a more diverse seed mix.</li> <li>▪ Pre-inoculated legume seed weights about one-third more than raw seed. Increase seeding rate by one-third to plant the same amount of seed per area.</li> <li>▪ Certain species are highly competitive against other species in a mix, including forage radish, oats, sorghum-sudangrass, and cereal rye. Use low rates of these species to prevent them from dominating a balanced mixture.</li> <li>▪ Legume components of a mixture, which tend to be weak competitors, are more safely kept near their normal rates to ensure establishment in the stand.</li> <li>▪ Seeding rate for functionally redundant species can be reduced again by the number of redundant species.</li> </ul>
Buckwheat	Nonlegume Forb	50F	½-1	-	0.5	1.1	2.1	
Clover, White/Dutch/Ladino	Legume	42F	¾-½	+	0.8	1.5	3.0	
Clover, Balansa	Legume	42F	¾-½	+	0.1	0.1	0.3	
Clover, Berseem	Legume	42F	¾-½	+	0.3	0.5	1.0	
Clover, Crimson	Legume	42F	¾-½	+	0.2	0.4	0.9	
Clover, Red	Legume	41F	¾-½	+	0.1	0.2	0.5	
Hemp, Sunn	Legume	68F	½-1½	-	1.0	1.9	3.9	
Kale	Brassica	40F	¾-½	-	0.1	0.1	0.3	
Millet, Japanese	Grass	65F	½-¾	-	0.03	0.1	0.1	
Millet, Pearl	Grass	65F	½-1	-	0.1	0.1	0.2	
Oats	Grass	38F	½-1	+	1.2	2.4	4.9	
Pea, Field	Legume	41F	1-1½	-	1.1	2.3	4.5	
Pea, Winter	Legume	41F	1-1½	-	1.1	2.3	4.5	
Pea, Cow	Legume	58F	1-1½	-	0.9	1.8	3.7	
Phacelia	Nonlegume Forb	37F	¾-½	n/a	0.04	0.1	0.2	
Radish (Oil Seed)	Brassica	45F	½-¾	+	0.1	0.3	0.5	
Rapeseed	Brassica	41F	¾-½	+	0.1	0.1	0.3	
Rye, Winter Cereal	Grass	34F	¾-1½	+	1.1	2.1	4.2	
Ryegrass, Annual	Grass	40F	¾-½	+	0.3	0.7	1.3	
Sorghum-sudangrass	Grass	65F	½-1½	-	0.8	1.5	3.0	
Soybean	Legume	50F	1-1½	-	1.8	3.5	7.1	
Sudangrass	Grass	65F	½-1	-	0.4	0.8	1.5	
Sunflower	Nonlegume Forb	65F	1-1½	-	0.4	0.7	1.4	
Triticale, Winter	Grass	38F	¾-1½	+	1.2	2.4	4.8	
Turnips / Pasja	Brassica	45F	¾-½	+	0.1	0.1	0.3	
Vetch, Hairy	Legume	50F	½-1½	+	0.3	0.7	1.3	
Wheat, Winter	Grass	38F	¾-1½	+	1.3	2.5	5.1	

# Indiana Cover Crop Create a Mix for Small Farms and Gardens



Name	County	Farm #	Tract #	Year

Cover Crop Species	Type	Rate L - N - H	Divisor	Rate Oz/100 ft <sup>2</sup>	Area Sq.ft.	PLS (%)	Bulk Rate Oz/Area	Bulk Rate Lbs/Area	# of Beds	Total Area Sq.ft.	Total Seed Ounces	Total Seed Pounds
Oats	Grass	Low		1.2	250	90	3.3	0.2	5	1250	16.7	1.0
Clover, Crimson	Legume	High		0.9		85	2.6	0.2			13.2	0.8
						100						
						100						
						100						
						100						
<b>Mix 1</b>				<b>2.1</b>			<b>6.0</b>	<b>0.4</b>			<b>29.9</b>	<b>1.9</b>
						100						
						100						
						100						
						100						
						100						
						100						
<b>Mix 2</b>				<b>0.0</b>			<b>0.0</b>	<b>0.0</b>			<b>0.0</b>	<b>0.0</b>
						100						
						100						
						100						
						100						
						100						
						100						
<b>Mix 3</b>				<b>0.0</b>			<b>0.0</b>	<b>0.0</b>			<b>0.0</b>	<b>0.0</b>

<b>Total</b>	<b>1250</b>	<b>29.9</b>	<b>1.9</b>
	<b>Sq.Ft.</b>	<b>Ounces</b>	<b>Pounds</b>

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>Refer to the Indiana Cover Crop Table for Small Farms and Gardens for species, rates, and termination methods.</li> <li>Follow Indiana Cover Crop Seeding Windows guidelines to ensure improved establishment and growth.</li> <li>Pure Live Seed (PLS - see seed tags) is the % of viable seed that is capable of developing into seedlings.<br/> <math>PLS = \% Purity \times \% Germination / 100.</math></li> <li>The divisor can be used to divide the rates of speices within a functional group.</li> </ul> | <p>Rates</p> <ul style="list-style-type: none"> <li>Normal = single species 100% canopy cover</li> <li>Low = half the normal rate</li> <li>High = double the normal rate</li> </ul> |
|---|---|



# Grower's Books

Jesse Frost                      The Living Soil Handbook – The No-Till Grower's Guide to Ecological Market Gardening / [notillgrowers.com](http://notillgrowers.com)

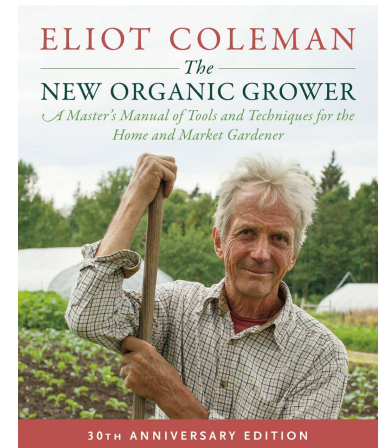
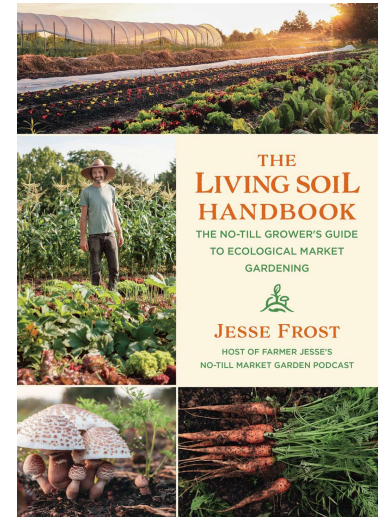
Jean-Martin Fortier      The Market Gardener: A Successful Grower's Handbook for Small-Scale Organic Farming

Daniel Mays                      No-Till Organic Vegetable Farm: How to Start and Run a Profitable Market Garden that Builds Health in Soil, Crops, and Communities

Eliot Coleman                      The New Organic Grower: A Master's Manual of Tools and Techniques for the Home and Market Gardener

Ben Hartman                      The Lean Farm: How to Minimize Waste, Increase Efficiency, and Maximize Value and Profits with Less Work

Bryan O'Hara                      No-Till Intensive Vegetable Culture: Pesticide-Free Methods for Restoring Soil and Growing Nutrient-Rich, High-Yielding Crops





THE  
END