

# Benefits of and best management practices for mustards and tillage radish cover crops

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Crucifer cover crops have great value in vegetable production, and they are also inexpensive to plant. This presentation will help you choose the one most suited to your management goals and planting opportunity. Below is an overview of crucifer cover crops, followed by a guide to help you choose the best crucifer for your growing needs.

Production details for all of these cover crops are available from Cornell at [covercrop.net](http://covercrop.net).

## Properties of all Brassica cover crops

- Excellent for disease suppression, winter weed suppression, and tillage improvement.
- Help soil re-aggregate if roots are allowed to decompose in undisturbed soil.
- Their deep tap roots can recover residual nitrogen. This nitrogen is available to next crop only if the cover crop dies in the spring.
- Inexpensive to use because the seed price is low (\$1 to \$4 per lb) as is the seeding rate (5 to 10 lb/ac).
- Small seeds, which require careful sowing, mean less bulk to plant.
- Most work best if sown in late August and left all winter.  
They need 1400 to 2000 GDD-32 between planting and frost. *The window closes fast.*
- Most respond well to nitrogen, just like other cole crops.
- Plants suppress each other at higher seeding rates.

## Fall crucifers are not biofumigants

Many varieties of crucifer cover crops are used as biofumigants. If biofumigation is your goal, sow biofumigant mustards in the spring instead.

Biofumigation requires the crop to be coming into bloom and the soil to be warm. That combination does not happen with fall-sown cover crops.

After fall-sown Brassica cover crops, simply prepare the ground normally in the spring. There is no need to do the extra steps to capture biofumigants. Indeed, by spring, the cover crop will be dead, or mostly so.

## Winter-hardiness

New York is right on the edge of the region where Brassicas are winter-hardy, so there are big differences in survival among the varieties. Most varieties of crucifer cover crop will winter-kill, leaving the field ready for planting spring-seeded crops early in the season. But be aware that even the most tender varieties can have some survivors in the field after mild winters. Unexpected survivors need to be killed before they make seed so that they don't become weeds. The flowering time varies by species, but is often in late April or May. The plants most likely to survive are those that are large enough to have strong anchor roots but are small enough that they do not start to swell (turnips and radishes) or bolt (mustard and rapeseed).

## The most common crucifer crops, from least winter hardy to most.

### Forage Radish

Winter kills early in winter. Makes two-inch-wide holes in surface soil, but the thinner tap root does a lot of the work. Similar to oilseed radish, but the thick part of the root goes deeper. The top of the radish can stick out of the soil several inches, making the field difficult to walk through. Winterkills too early in New York for good nitrogen recovery. Some growers are using rows of radish in a grain cover crop to simulate zone tillage.

<i>Variety</i>	<i>Comment</i>	<i>Vendor</i>
Tillage radish	From Steve Groff (Biodrills)	Bird, Kings, Lancaster
GroundHog	Blackrot tested	Seedway

### Yellow Mustard

Bolts quickly any time. Excellent for chickweed suppression. Bolted plants hold snow in place. Winterkills too early in New York for good nitrogen recovery. Tilney mustard can also be frost seeded in February or March.

<i>Variety</i>	<i>Comment</i>	<i>Vendor</i>
Tilney	Low glucosinolate	Minn-Dak, Lakeview
Idagold	High glucosinolate	McKay

### Brown Mustard

High glucosinolates. Can also be sown during the summer, when it makes a rosette for good ground cover. Slower to bolt than yellow mustard.

<i>Variety</i>	<i>Comment</i>	<i>Vendor</i>
Florida Broadleaf	Common for mustard greens	Many
Caliente 199	Blend with yellow	Rupp
Pacific Gold	Has yellow seeds	McKay

### Rapeseed

Begins as a rosette, but will begin to bolt in the fall. Bolted plants die during the winter, but after mustards.

<i>Variety</i>	<i>Comment</i>	<i>Vendor</i>
Rangi		Ernst, Kings, Albert Lea
Bonar	Slightly hardier	Kings, Lancaster, Albert Lea

## Forage Turnip

Makes a strong rosette and bolts later than rapeseed. Rosette provides good soil cover for minimal winter growth. Can survive until after snow melts, so is most likely to release nitrogen that will be available to the following crop. These high-protein varieties have more nitrogen to release than others.

<i>Variety</i>	<i>Comment</i>	<i>Vendor</i>
Appin	More bulb	Ernst, Kings, Albert Lea
Pasja	Slow bolting, more leaf	Ernst, Kings, Lancaster

## Arugula

For nematode suppression. Establishes more slowly than other crucifers. NY successes reported only on muck so far.

<i>Variety</i>	<i>Comment</i>	<i>Vendor</i>
Nemat	Very small seed	Rupp

## Winter Canola

Survive winter. Use OP varieties that are much cheaper than hybrids and cheaper than other crucifers. Slow growing in fall, so the weed suppression is weaker. Bolts in spring. Can frost heave if sown late. Canola is low in glucosinolate, so biofumigation with spring growth is not an option.

<i>Variety</i>	<i>Comment</i>	<i>Vendor</i>
Athena	Western type	Seed Center
Sumner	Hardier than Wichita	Johnston
Wichita	Tested in PA and Midwest	Blue Sun

Contact information for seed sources mentioned above

Albert Lea Seedhouse	Albert Lea, MN	800-352-5247	<a href="mailto:seedhouse@alseed.com">seedhouse@alseed.com</a>
Bird Hybrids	Tiffin, OH	800-743-BIRD	<a href="mailto:leon@birdhybrids.com">leon@birdhybrids.com</a>
Blue Sun Biodiesel	Golden CO	303-865-7700	<a href="mailto:ryan@goBlueSun.com">ryan@goBlueSun.com</a>
Ernst Conservation Seed	Meadville, PA	800-873-3321	<a href="mailto:sales@ernstseed.com">sales@ernstseed.com</a>
Johnston Seed Co,	Enid, OK	800-375-4613	<a href="mailto:johnseed@johnstonseed.com">johnseed@johnstonseed.com</a>
Kings Agriseed	Ronks, PA	866-687-6224	<a href="mailto:info@kingsagriseeds.com">info@kingsagriseeds.com</a>
Lakeview Organic Grain	Penn Yan, NY	315-531-1038	<a href="mailto:sales@lakevieworganicgrain.com">sales@lakevieworganicgrain.com</a>
Lancaster Ag Supply	Ronks, PA	717-687-9222	<a href="mailto:sales@lancasterag.com">sales@lancasterag.com</a>
McKay Seed	Moses Lake WA	509-750-4548	<a href="mailto:gaylin@mckayseed.com">gaylin@mckayseed.com</a>
Minn Dak Growers	Grand Forks, ND	701-746-7453	<a href="mailto:info@minndak.com">info@minndak.com</a>
Rupp Seed Co.	Wauseon, OH	800-700-1199	<a href="http://ruppseeds.com">ruppseeds.com</a>
Seedway Vegetable Seed Seed Center	Elizabethtown, PA Ostrander, OH	800-952-7333	<a href="mailto:vegseed@seedway.com">vegseed@seedway.com</a> <a href="mailto:info@theseedcenter.com">info@theseedcenter.com</a>