

Cover Crop

Planting Specification Guide

ME-340

SCOPE

Establishing grasses, legumes, and other herbaceous materials for seasonal cover, organic matter additions, weed control, or conservation purposes.

CONVENTIONAL SEEDING TECHNIQUES **(Drill, Broadcast)**

Seedbed Preparation: A seedbed will be prepared if needed. Seedbed shall be adequate to ensure seed/soil contact.

Legume and grass cover crops can be established by broadcasting seed onto freshly disturbed ground, preferably followed by a light incorporation or rolling/packing. On more compacted cropland, small grain cover crops may be established after harvest by either broadcasting of the seed followed by light disking, or by using a grain drill.

Cover crops in corn can be established by broadcasting seed at last cultivation, seeding after harvest as described above, by interseeding, or by aerial seeding as described in this document.

Seeding depth: Plant seed at the following depths:

Grasses and legumes: ¼ to ½ inch
Small Grains: 1 to 1-1/2 inch

Lime and Fertilizer: Lime and fertilizer will be applied on the basis of needs as determined by a soil test whenever possible. Without a soil test, determinations of the needs will be met as follows:

1. For annual crops, apply lime based upon the need of the next crop to follow.
2. Nitrogen applications should be based on crop needs (see Maine Soil Testing Guide – [HTTP://ANLAB.UMESCI.MAINE.EDU/SOILLA](http://anlab.umesci.maine.edu/soilla)

[B FILES/FAQ/HANDBOOK.PDF](#)).

3. For permanent crops, soil amendments will be based on soil tests results.

Cover and Green Manure Crops: Crops most commonly used for cover and green manure are included in **Table 1**. They will be seeded not later than the dates and at the rates shown to provide adequate annual cover.

Biennial and perennial grasses and legumes will be considered within the intent of this practice when they are established on croplands and are managed to provide protection during a definite hazardous period, are grown for the primary purpose of returning organic matter to the soil, or to provide a method of weed control or suppression in rotational systems.

Cover and green manure crops shall be plowed, disked under, or killed as late as feasible to maximize plant biomass production, allowing time needed to prepare the field for planting of the next crop, unless no-tilled. See “Terminating Cover Crops”, below. (Caution: Winter cereal grains may produce a large volume of carbonaceous material that may tie up nitrogen for the following crop.)

AERIAL SEEDING

Intent of this section is to maximize chances of successful aerial seeding of winter grains such as Rye, Wheat, Triticale, or Spelt into standing corn grown for silage.

Seed Quality and Rate:

1. Use high quality seed free of disease, insects, and weed seed.
2. Minimum germination of 80 percent.
3. Use minimum germination of 2 bu./acre (112 lbs.)

Aircraft:

Aircraft must be calibrated carefully and fly at a uniform height above ground.

Time of Seeding:

Seeding will normally take place the first two weeks in August. Seeding will develop under the corn canopy.

Harvesting Corn to Protect Cover:

1. Minimize number of trips across the field.
 - a. Change trucks, chuck-wagons, etc., at edges of field only.
 - b. Use two-row choppers, if available.
2. Do not harvest when fields are too wet to support the harvesting equipment.

Chemical Residue Effects: Ensure that herbicides used will not interfere with cover crop establishment.

INTERSEEDING

Corn

Interseeding a cover crop into an existing corn crop has been successful in Maine. The species most often recommended for this purpose is annual ryegrass.

The key to successful seeding is to get the seed in contact with moisture. Under dry conditions, drilling is essential. If the soil surface is moist, broadcasting without covering is effective. Good seedling growth requires continued moisture. Often seeding can be combined with a final cultivation. Annual ryegrass will mostly overwinter, especially when there is a good snow cover. Winter survival varies considerably among varieties: Southern types will winter kill in Maine and Midwestern ones will survive. The variety is often not specified in the Northeast market, so winter survival may not be consistent.

Other Crops

Annual Ryegrass can be interseeded into crops that will be harvested in late August or September. If conditions are moist, simply broadcasting seed on the surface is enough.

Interseeding is best done just before the crop fills the canopy. The cover crop will begin to establish a shallow root system, but will not be overly competitive due to shading by the major crop. This early sod can reduce damage from harvest traffic, and can help speed the recovery of the soil after harvest. Interseeding into a vegetable crop allows the cover crop to establish better in the fall than does a grain sown well after vegetable harvest.

Broadcasting Annual Ryegrass requires 15-20 lb/ac. On dry soil, rates may be increased as high as 30 lb/ac.

SELECTING COVER CROPS

Select cover crops, planting dates and seeding rates. See section titled, "Characteristics of Some Common Cover Crops," and Tables 1, 2a, and 2b at the end of this guide.

Ensure that crops are compatible with the cropping system and soils. Brief descriptions of the cover crops can be found at the end of this guide, and more detailed information can be found in "Managing Cover Crops Profitably" <http://www.sare.org/Learning-Center/Books/Managing-Cover-Crops-Profitably-3rd-Edition>, and "Cornell Cover Crop Guide" <http://covercrops.cals.cornell.edu/>.

Label (or tested) Germination % should be greater than 80%. If it is less than 80%, the seeding rate should be increased to compensate.

Consider using regional seed sources for improved reliability and performance.

Mixes

Common mixes include a small grain like winter rye or oats with hairy vetch, red clover or peas. Other common mixes include annual ryegrass and clovers, timothy and alfalfa, and sorghum sudangrass or millets with soybean or cowpea. Trial unfamiliar combinations on a small scale

to determine if they will work.

When calculating a seeding rate for cover crop mixtures, *ensure that the sum of the proportional rates used is greater than or equal to 100% using the following formula:*

$(\text{Desired lbs of Crop A} / \text{full rate Crop A}) + (\text{Desired rate crop B} / \text{full rate Crop B}) \geq 1.0$ (or 100%).

Example:

Crop A = Oats, full seeding rate = 140 lbs/ac
Crop B = Hairy Vetch, full seeding rate = 35 lbs/ac

Mix of 80 lbs/ac oats + 20 lbs vetch
 $(80/140) + (20/35) = 1.14$. This is an adequate mix rate.

A mix of 80 lbs/ac oats + 10 lbs/ac vetch
 $(80/140) + (10/35) = .86$. This is not an adequate mix rate.

Grazing

A number of cover crops can be grazed prior to termination to improve the overall value of the cover crop. Check each cover crop to ensure that the crops pose no danger to livestock. A few examples are: (i) sorghum-sudan grass may cause prussic acid and nitrate poisoning if the young growth is grazed or if the crop is grazed after frost, (ii) seed of chickling vetch contain a neurotoxin that may cause illness, (iii) alsike clover may cause photo-sensitivity in horses and other livestock (especially white-skinned animals), (iv) turnips may cause copper toxicity in sheep, (v) red clover contains phytoestrogens that may complicate sheep breeding, and (vi) many of the legumes may cause bloat and should not be grazed when wet.

Living Mulches

Vegetable crop producers may consider using living mulches to prevent erosion, improve soil structure and microbial population, improve water relations, and provide beneficial insect habitat. Legume living mulches like Berseem clover are well suited for NH and provide supplemental N if they are mown and blown to

adjacent cash crop rows. Living mulches can be established before or after the cash crop is planted, and can be used alone or in combination with plastic mulch. Typically, living mulches should be low-growing and tolerant of mowing. Living mulches should be mowed if becoming overly competitive or if going to seed.

TERMINATING COVER CROPS

Cover crops can be terminated as much as 5 days *after* the main crop is planted, but must be terminated prior to *crop emergence*.

In general, terminate cover crops at least 1-2 weeks prior to planting the cash crop. Note that winter cereal grains, such as rye, may produce a large volume of carbonaceous material that may tie up nitrogen for the following crop.

Monitor crop maturity carefully to time termination. When terminating cover crops by mowing or crimping, plants must often be in full flower or fully mature in order to completely kill. Avoid future weed problems by ensuring that cover crops are terminated prior to seed set (unless a reseeding of cover is the goal).

WEED CONTROL STRATEGY

The Maine Organic Farmers and Gardeners Association (MOFGA) (1), recommends the following: Plant Oats very early spring. Till in early summer. Plant a smother crop (buckwheat, Japanese millet or sorghum-sudan grass). In late summer, till in smother crop and plant oats or rye for fall cover. Between each crop, perform a weekly tillage of the ground for one to three weeks depending on weed severity. Be vigilant to prevent weeds from going to seed.

Characteristics of Some Common Cover Crops

Cool-Season Annual Grains

Winter Rye (*Secale cereale*)

Is the most reliable cool season cover crop. Rye establishes easily, produces a lot of biomass, and suppresses weeds. It can be planted the latest in fall and is the most hardy. The 'Aroostook' variety was developed for the Northeast for seeding after late harvested crops, and is recommended over Common Rye (VNS).

Rye may be killed by mowing or crimping after it forms a head, or earlier by chemical means. It may tie up N if not grown with a legume or if incorporated when too mature. It is generally incorporated when it is 12-18" tall, about 2 weeks before planting, or chemical killed prior to no-till planting. May be allelopathic if vegetable seeds are planted immediately after rye termination. Commonly mixed with hairy vetch or red clover.

Winter Wheat, Triticale, and Spelt (*Triticum spp.*)

Winter varieties of these grains are hardy cover crops that can suppress weeds and produce a moderate to high amount of biomass. Triticale is a cross between wheat and rye, and spelt is an ancient subspecies of wheat. Commonly mixed with peas, vetch, and clover. Hessian fly can be a problem with wheat and spelt harvested for grain, but is generally not a problem if used solely as a cover crop.

Wheat, Triticale, and Spelt will not produce as much biomass as rye, and therefore may not tie up as much N in the spring. Wheat is a good nutrient catch crop and prefers well-drained, fertile soils. Spelt may perform better on poor soils, and often out-performs other winter grains when seeding is late. Spring wheat can be planted in the early spring and will produce a lot of biomass later into the summer.

Spring Barley (*Hordeum vulgare*)

Is an easy to grow, deep-rooted crop that is good

at controlling erosion, suppressing weeds, and producing biomass. It does poorly in wet, heavy soils, and is more drought tolerant than other small grains. It is commonly mixed with peas, oats, and crimson or red clover. Barley can be killed by mowing or rolling at milk stage. It will also winter kill in Maine.

Oats (*Avena sativa*)

Are commonly used as a spring and fall cover. Oats establish rapidly and are easily killed. They will winterkill in Maine. They provide good erosion control, and tend to leave a clean seedbed. Oats can be used by vegetable growers prior to early spring crops. They are commonly used as a nurse crop for permanent seedings that are done in spring.

Warm-Season Annual Grains

Buckwheat (*Fagopyrum esculentum*) Is one of the quickest growing summer annuals, and is commonly used as a smother crop, nurse crop and insectary. Buckwheat tolerates poor soils and can extract nutrients from the soil. Plants mature in 6-8 weeks, and residue degrades rapidly. If mown prior to flowering, the crop should regrow. Buckwheat should be mown or incorporated into the soil before seed set so that it does not become a weed problem.

Sudangrass and Sorghum-Sudangrass

(*Sorghum bicolor* x *S. bicolor* var *Sudanese*), Also known as Sudax, is a vigorous warm season grass that produces large amounts of biomass, increases organic matter, reduces compaction and nematodes, and can provide excellent forage and insect habitat. Can be mixed with a buckwheat nurse crop or with forage soybeans and cowpeas.

Sudax can be mowed 2-3 times when it reaches a height of 3-5 feet (leave at least 6" or 2 nodes for regrowth). Very responsive to nitrogen fertility. Sudax planted in mid-July will frost kill. Also good for emergency forage to replace a failed crop.

Japanese Millet (*Echinochloa esculenta*), **Pearl Millet** (*Pennisetum glaucum*) and **Foxtail Millet** (*Setaria italica*)

Are drought and heat tolerant summer annuals that produce a lot of biomass quickly. Plant Japanese and Foxtail millet early in June. Later plantings may be weak due to day length response. Commonly mixed with forage soybeans and cowpeas. Pearl millet is very tall and produces the most biomass. Pearl and Foxtail millet should mow kill, but Japanese millet will regrow. May also be used as emergency forage.

Teff (*Eragrostis tef*)

Is a fine-leaved African grain that shows a lot of potential as a living mulch. It is very drought tolerant, can be surface broadcast, does not need much mowing, and will not go to seed. Ensure a firm seedbed prior to planting. Teff is also a quality forage that can be grazed/hayed during dry summers.

Legumes

Red Clover (*Trifolium pratense*)

Is a short-lived cool season perennial that is often used as an annual. Red clover is deep-rooted, produces a lot of N, and provides beneficial insect/pollinator habitat. It tolerates poorly drained and acidic soils. It can be interseeded with many crops, such as small grains after planting, silage corn at last cultivation, or into vegetables before harvest. Red clover does very well when frost-seeded and mixed with small grains or annual ryegrass.

White Clover (*Trifolium repens*)

Is a low growing perennial that produces moderate levels of N, and tolerates traffic and close mowing. Common white clover is the lowest growing type that tolerates the most traffic and compaction. Dutch and New Zealand are intermediate, widely available types that are commonly used as living mulches. Ladino clover is the tallest white clover and produces the most nitrogen. White clover does well interseeded or frost seeded, and is often mixed with annual ryegrass, small grains, or red clover.

Alsike Clover (*Trifolium hybridum*)

Is an upright hybrid of red and white clover that produces more N than intermediate types and does the best in poorly drained soil. Alsike can cause sun sensitivity in horses and some other livestock, especially white animals.

Yellow Sweetclover (*Melilotus officinalis*) is a highly productive biennial legume and **White Sweetclover** (*Melilotus alba*) is an annual.

Sweetclover produces a lot of N and biomass, has a deep root that breaks up hardpan, scavenges phosphorus, and provides beneficial insect habitat. It is better suited for well drained and droughty sites. Yellow sweetclover will mow-kill after flowering in the second year. Use yellow sweetclover only if it will be grown through the second year, otherwise use annual or 'Hubam'. Prefers spring seeding. *Caution: Hard seed may remain viable in soil for years.*

Crimson Clover (*Trifolium incarnatum*)

Is an annual legume that will winter kill like oats. It establishes easily, produces a moderate to high amount of N and biomass, suppresses weeds, and has beautiful flowers that attract a lot of beneficial insects and pollinators. Select regionally-adapted varieties for improved cold hardiness.

[Crimson clover](#) is easily crimped with a lasting residue. It has potential to be frost seeded, crimped, and used as mulch for late planted no-till pumpkin transplants. Often mixed with annual ryegrass, small grains, and brassicas. *Caution: may support nematodes that impact tomatoes.*

Subterranean Clover (*Trifolium subterraneum*)

Is a low growing, self-seeding annual hardy to 0-15° F. It produces a moderate amount of N, provides beneficial insect habitat and is best used as a [living mulch](#). It is a shade tolerant crop that tolerates wet soils, acidic soils, mowing and grazing. Subterranean clover and teff may make a great living mulch. Subterranean clover will reseed and should be mowed or killed prior to seeding if growing leafy greens or other crops where it could be a problem.

Berseem Clover (*Trifolium alexandrinum*)

Arugula (*Eruca sativa*)

Is an effective biofumigant that will overwinter. Mow and incorporate in the spring before seed set and seal soil with plastic, irrigation, or by rolling for at least 10 days.

[Center/Books/Building-Soils-for-Better-Crops-3rd-Edition](#)

Grasses

Annual and Perennial Ryegrass (*Lolium* spp.)

Are cool season grasses with a high utility value because they establish easily when surface broadcast and can be interseeded, frost-seeded, and dormant seeded. Ryegrass produces a tremendous amount of biomass, reduces surface compaction, scavenges nutrients, and is a strong erosion fighter. Annual varieties tend to be cheaper than perennial, are used as cool- and warm-season cover, and are used as living mulches. Southern varieties will winterkill, whereas regionally adapted annual varieties may overwinter in warmer areas of northern New England. Perennial rye may be short-lived. Both are heavy feeders and will not do well in poor soils.

Orchardgrass (*Dactylis glomerata*) and **Timothy** (*Phleum pratense*)

Are perennial grasses that are commonly used as forages. They are highly productive and should be planted with clovers. Like alfalfa and sweetclover, these grasses are best used as a cover crop if grown for a full season and terminated in the second year. *Caution: May become a weed problem if allowed to go to seed.*

RESOURCES

(1) See MOFGA's "Using Green Manures" factsheet <http://www.mofga.org/Publications/FactSheets/tabid/133/Default.aspx>

Clark (ed.). 2007. Managing cover crops profitably. 3rd ed. Sustainable Agriculture Network Handbook Series. <http://www.sare.org/Learning-Center/Books/Managing-Cover-Crops-Profitably-3rd-Edition>

Magdoff, F. and H. van Es. 2009. Building Soils for Better Crops. 3rd ed. Sustainable Agriculture Network Handbook Series. <http://www.sare.org/Learning->

Table 1. Crops, Seeding Dates, and Rates for Establishing Adequate Annual Cover. Use the appropriate inoculants when seeding legumes.

Crop	Minimum Seeding Rate lb/ac	Winter*** Cover	Summer Cover
Ryegrass, Annual or Perennial	20	9/15	---
Spelt, winter annual	140	9/15	---
Wheat, winter annual	120	9/15	---
Triticale, winter annual	120	9/15	---
Spring Barley or Spring Wheat**	60	--	5/1
Oats*	80	9/1	5/20
Sudangrass*	25	--	6/15
Millet*	20	--	6/15
Buckwheat*	75	--	6/15
Red Clover *	10	--	6/1
Hairy Vetch* (with small grain)	30 vetch, 70 small grain	9/15	---
Forage Brassicas	15-20, or 10-15 w/ 40 lbs. winter grain	9/15	---
Oilseed Radish	15-20, or 10-15 w/ 40 lbs. winter grain	9/15	---

“Aroostook” Winter Rye Rates – Bushels/Acre

Location	September				October			
	15	20	25	30	5	10	15	20
Caribou	2.0	3.5	5.5	---	--	--	--	--
Houlton	2.0	2.5	4.5	5.5	--	--	--	--
Corinna	2.0	2.0	2.0	3.5	5.5	--	--	--
Bridgton (1)	2.0	2.0	2.0	2.0	3.0	--	--	--
Portland (1)	2.0	2.0	2.0	2.0	3.0	4.0	5.0	--

* Plant at 125 lb/ac for seedings later than 5/10 except in Aroostook, use 5/15

** Note: This crop will winter kill

*** Best if sown before date listed. For later planting, increase rate by 50%. Do not exceed 14 days past listed date.

Table 2a	Purpose									Other Roles & Characteristics										
Cover Crop	Reduce Erosion	Increase SOM	Recycle Nutrients	Fix Nitrogen Save Energy	Improve Biodiversity	Suppress Weeds	Remove Excess Soil Moisture	Loosen Topsoil	Reduce Subsoil Compaction	Grazing Potential	Living Mulch	Broadcast Interseed	Companion Crop	Nurse Crop	Reduce Soil Diseases	Rapid Growth	Drought Tolerant	Flooding Tolerant	Shade Tolerant	Reseeds (Potential Weed)
Cool-Season Grains																				
Winter Rye (Common)	✓+	✓+	✓+			✓+	✓+	✓+		✓-		✓		✓	✓	✓	✓	✓-	✓	✓
Winter Rye (Aroostook)	✓+	✓+	✓+			✓+	✓+	✓+		✓-		✓		✓	✓	✓+	✓	✓-	✓	✓
Triticale and Spelt	✓	✓+	✓			✓	✓+	✓	✓-	✓				✓+		✓	✓-			
Wheat	✓	✓+	✓			✓	✓+	✓	✓-	✓				✓+		✓	✓-		✓-	✓-
Barley	✓+	✓+	✓		✓-	✓	✓	✓	✓-	✓				✓+	✓-	✓	✓		✓-	✓
Oats	✓-	✓	✓-			✓+	✓	✓		✓-	✓-	✓-	✓+	✓+	✓-	✓+		✓-		
Warm-Season Grains																				
Buckwheat		✓-	✓+		✓+	✓+		✓					✓+	✓		✓+				✓+
Sorghum/Sudangrass	✓+	✓+	✓+		✓-	✓+	✓-	✓-	✓+	✓					✓	✓+	✓+	✓-	✓-	✓-
Japanese/Foxtail Millet	✓	✓+	✓			✓+		✓		✓+				✓		✓	✓+			✓-
Pearl Millet	✓	✓+	✓			✓+		✓		✓-						✓	✓+			✓-
Teff	✓+	✓	✓-			✓-		✓+		✓+	✓+	✓-	✓-	✓			✓+			
Legumes																				
Red Clover	✓-	✓	✓	✓	✓+	✓-	✓	✓-	✓	✓+		✓+	✓+					✓-	✓	
White or Alsike Clover	✓	✓		✓	✓	✓	✓	✓		✓+	✓	✓	✓				✓-	✓	✓	✓+
Berseem Clover	✓	✓+	✓+	✓+	✓-		✓+	✓		✓+	✓+	✓	✓	✓		✓+	✓-	✓-	✓	
Sweetclover	✓	✓+	✓+	✓+	✓+	✓	✓	✓+	✓+	✓						✓-	✓+			✓-
Crimson Clover	✓	✓		✓	✓+		✓-	✓-		✓+		✓+	✓+			✓-			✓	✓+
Subterranean Clover	✓	✓		✓	✓	✓+	✓+	✓-		✓	✓+	✓+	✓+			✓-	✓	✓-	✓	✓+
Alfalfa	✓	✓+		✓+	✓		✓		✓+	✓+										
Hairy Vetch	✓-	✓+	✓-	✓+	✓	✓	✓	✓	✓-	✓-	✓-	✓	✓		✓-		✓-		✓-	✓-
Chickling Vetch	✓	✓	✓-	✓+	✓-	✓	✓	✓		✓+	✓	✓	✓				✓-		✓-	✓-
Field Pea	✓	✓		✓+	✓		✓	✓		✓			✓+	✓	✓	✓	✓-			
Soybean	✓-	✓		✓+				✓		✓			✓+				✓			
Cowpea	✓+	✓	✓-	✓+	✓	✓+		✓	✓-	✓-			✓			✓	✓		✓-	
Brassicas																				
Radish or Turnip	✓	✓	✓+			✓+		✓-	✓+	✓-		✓	✓-			✓			✓-	✓-
Mustard or Canola	✓	✓	✓		✓-	✓-		✓		✓-		✓	✓-	✓-	✓+	✓	✓		✓-	✓+
Arugula	✓	✓-	✓-					✓				✓			✓+	✓			✓-	✓-
Grasses																				
Annual Ryegrass	✓+	✓+	✓+			✓+	✓+	✓+		✓+	✓	✓+	✓+	✓+	✓-	✓		✓	✓	✓+
Perennial Ryegrass	✓+	✓+	✓+			✓	✓+	✓+		✓+	✓	✓+	✓	✓	✓-	✓		✓	✓	✓
Orchardgrass	✓+	✓+	✓-			✓	✓+	✓		✓+		✓				✓		✓	✓-	✓
Timothy	✓+	✓+	✓-			✓	✓+	✓		✓		✓-						✓-		✓

Rating: Above Average (✓+); Average (✓); Below Average/Unknown (✓-). Blank = Not Recommended

Table 2b Cover Crop	Seeding Rate (lbs/acre)		Seeding Depth Inches	Planting Season								Termination Method					
	Broadcast	Drilled		Spring	Early Summer	Summer	Early Fall	Fall	Late Fall	Dormant	Frost	Mow	Till	Crimp	Frost	Winter	Chemical
Cool-Season Grains																	
Winter Rye (Common)	150	110	1-2				✓	✓+				✓	✓	✓+		✓	
Winter Rye (<i>Aroostook</i>)	150	110	1-2				✓	✓+	✓			✓	✓	✓+		✓	
Triticale and Spelt	150	110	1-2				✓	✓+				✓	✓+	✓		✓	
Wheat	160	120	½-1½	✓+			✓+	✓+				✓	✓+	✓		✓	
Barley	160	120	1-2	✓+			✓					✓	✓+	✓		✓-	
Oats	140	100	½-1½	✓+			✓+			✓-	✓-	✓-	✓+	✓		✓	
Warm-Season Grains																	
Buckwheat	90	70	½-1½		✓+	✓+						✓	✓+	✓+	✓	✓+	
Sorghum/Sudangrass	50	35	½-1½		✓+	✓+							✓		✓	✓+	
Japanese/Foxtail Millet	35	25	½-1½		✓	✓							✓		✓	✓+	
Pearl Millet	30	20	¾-1½		✓	✓						✓	✓	✓	✓	✓+	
Teff	10	8	0-¼		✓	✓							✓		✓	✓+	
Legumes																	
Red Clover	15	10	¼-1½	✓+				✓+			✓	✓					
White or Alsike Clover	12	8	¼-1½	✓+	✓			✓+			✓	✓					
Berseem Clover	20	15	¼-1½	✓+	✓+	✓		✓-		✓-	✓-		✓-		✓-	✓	
Sweetclover	20	15	¼-1½	✓				✓		✓-	✓-	✓-	✓				
Crimson Clover	30	20	¼-1½	✓+	✓+	✓		✓		✓-	✓-	✓	✓	✓+		✓-	
Subterranean Clover	30	20	¼-1½	✓	✓+	✓							✓-		✓-	✓	
Alfalfa	20	15	¼-1½	✓+				✓					✓			✓-	
Hairy Vetch	35	25	½-1½					✓+		✓-	✓-	✓-	✓-	✓+	✓-	✓	
Chickling Vetch	70	50	½-1½	✓+	✓	✓-				✓-	✓-	✓-	✓-	✓		✓	
Field Pea	140	100	1-3	✓+	✓			✓+				✓+	✓+	✓		✓	
Soybean	120	90	1-2	✓	✓							✓	✓+	✓-		✓	
Cowpea	140	100	¾-1½		✓	✓+						✓-	✓+	✓-	✓-	✓	
Brassicas																	
Radish or Turnip	15	10	¼-1½	✓+	✓			✓+		✓	✓	✓	✓+	✓	✓-	✓	
Mustard or Canola	15	10	¼-¾	✓+	✓			✓+		✓	✓	✓-	✓	✓	✓-	✓	
Arugula	4	3	¼-1½					✓+					✓+			✓	
Grasses																	
Annual Ryegrass	30	20	0-½	✓+	✓	✓-		✓+		✓+	✓+	✓	✓+			✓-	
Perennial Ryegrass	35	25	0-½	✓+				✓-		✓	✓		✓+			✓-	
Orchardgrass	20	15	0-½	✓+				✓-		✓	✓		✓+			✓	
Timothy	15	10	0-½	✓+				✓-		✓	✓		✓+			✓	

Reliability: Above Average (✓+); Average (✓); Below Average/Unknown (✓-). Blank = Not Recommended