

## Annual Cover Crops in Florida Vegetable Systems Part 3. Buying and Sourcing<sup>1</sup>

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Cover crops are crops grown for harvestable seed as well to improve the efficiency of the farming system. Cover crops can perform many ecological services on the farm, including suppressing weeds and nematodes, attracting beneficial insects, adding organic matter to the soil, supplying nitrogen, improving soil texture, and minimizing the leaching and runoff of agricultural chemicals. A wide variety of cover crops is available to producers. The subtropical Florida climate provides opportunity to use forages, tropical legumes, and, in the northern part of the state, winter annual cereals and legumes (Table 1). This publication presents points to consider when purchasing cover crop seeds and provides contact information for cover crop seed retailers and wholesalers. It is part three of a three part series. For remaining parts to the series "Annual Cover Crops in Florida Vegetable Systems" including "Part 1: Objectives" and "Part 2: Production," please visit <http://edis.ifas.ufl.edu>.

### 3a. Things to Consider When Purchasing Cover Crop Seed

**Sources.** Demand for cover crop seed is greater than ever. Producers who desire to reduce production costs and conserve natural resources are increasingly turning to cover crops as a method to accomplish those goals. This demand has encouraged research and breeding efforts on cover crop species. Seed sold in the U.S. is produced domestically as well as abroad. Winter annual cover crops including legumes and cereal grains are produced mostly in the northeast and in Canada. Many tropical summer legumes are produced in Hawaii, and some varieties of tropical legumes may come from Asia, India, and South America. If you decide to try something new, be sure to ask about seed size and shape to determine if the seed is appropriate for the planting equipment on your farm (Figure A, Figure B, and Figure C).

Seeds of cover crops come in all shapes and sizes. Shown here are: A) Lab-lab - legume, B)

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**Figure 1.** Seeds of cover crops come in all shapes and sizes. Shown here are: A) Lab-lab – legume Credits: Danielle Treadwell



**Figure 2.** B) daikon – mustard Credits: Danielle Treadwell



**Figure 3.** C) winter annual cereal rye- grass Credits: Danielle Treadwell

daikon - mustard, C) winter annual cereal rye- grass (photo credits D. Treadwell).

**Cost.** There are many advantages to planting cover crops, such as reduced erosion and enhancement of biological control and nutrient cycling. There are also disadvantages, including additional production costs, delays in planting vegetables, increased pest occurrence and N immobilization. Most of these disadvantages can be avoided with a little research and good planning and execution.

Cover crop costs and benefits should be evaluated based on the degree the crops will fulfill agroecosystem services and production objectives. The complexity of cropping systems that include cover crops can make it extremely difficult to assign a dollar figure to the benefits, particularly those that are achieved in the long term. In one recent analysis of cover crop benefits and costs, Snapp et al. (2005) observed that, in general, cereal cover crops were best suited to increase soil organic matter; legumes

were best suited to provide nitrogen, and brassicas were most effective at controlling a wide spectrum of soil pests.

The cost of seed will be influenced by the country of origin and the distance it must travel to get to your address. The cost per pound of cover crop seed is most often very reasonable for the ecological services cover crops provide (Snapp et al., 2005). A pound of winter annual rye typically costs between 75 cents to \$2.00 a pound. When seeded to 50 pounds an acre, the cost ranges from \$38 to \$100 per acre.

**Legume Inoculants.** When purchasing legume seeds, it is important to also purchase the correct inoculant. Inoculation is the application of specific nitrogen-fixing bacteria to the seeds before planting. The cross-inoculation groups of most of the field and forage legumes commonly grown in Florida are tabulated in Adjei, et al. (2006). These nitrogen-fixing bacteria attach to roots of legumes and convert nitrogen gas from our atmosphere to a form of nitrogen that the legume can use. A summary of recommended inoculants for legumes is provided in Table 2 below. Inoculants are an inexpensive method to use to ensure a good stand and to improve the efficiency of nitrogen fixation. They can be mixed in dry with cover crop seed before planting, but research indicates that using a sticking agent improves nitrogen fixation (SAN, 2007). For improved contact and retention, add a mixture of 10% sugar syrup and water to the cover crop seed prior to adding inoculant. The inoculant contains live organisms; therefore, do not expose it to direct sun or excessive heat. Store inoculant in the refrigerator, and use it before the expiration date. Contact information for inoculant retailers is noted in Table 3 below. To learn more about inoculation of legumes, see: <http://edis.ifas.ufl.edu/AG152>.

**GMO-Free Cover Crop Seed.** Some retailers offer seed with claims that it is free of genetic material created by genetic engineering biotechnologies. The claim typically reads "GMO-free," which means that seeds are free from genetically modified organisms (GMOs). Laboratory tests can detect genetically modified seed. If producers desire to have GMO-free seed, they should contact the retailer and request documentation for the

claim. Several federal agencies are involved in the regulation and oversight of GMO seed and other agricultural products. Claims that products are GMO-free are not regulated by the federal government.

**Organic Cover Crop Seed.** Many producers who are transitioning to organic frequently ask where they can purchase organic cover crop seed locally. Fortunately, there are several locations in Florida and neighboring southeastern states that sell certified organic cover crop seed. The National Organic Program Standards on annual seeds including cover crop seed state that organically grown seeds must be used (CFR 205.204). Many commercially available cover crop seeds have been treated with prohibited substances such as a synthetic fungicide, but in many cases untreated seed is available.

Nonorganic, *untreated seeds* can be used as a last resort in the following situations:

- When an equivalent organically produced variety is not available, untreated seeds may be used.
- When a temporary variance has been awarded by the producer's certification agency.

*Treated* seeds can be used in the following situations:

- When the seed treatment is allowed by the National Standards (such as certain seed-pelleting materials for small seeded crops).
- When federal or state phytosanitary regulations require that seed be treated with a prohibited substance (such as a synthetic pesticide).

Producers who plant nonorganic, untreated seed must provide documentation to support why organic seeds were not planted. Documentation typically includes a written account of at least three attempts (phone calls, written requests) for organic cover crop seed to support a substitution. Treated seed use must be supported by documented evidence of federal or state regulations. Organic producers are required to save all seed labels for their records. As always, producers must get approval from their certification agency before making any changes or substitutions to

their farm plans. For more information on organic seeds, please see "Seed Production and Seed Sources of Organic Vegetables" at <http://edis.ifas.ufl.edu/hs227>. Contact information of some seed suppliers that provide organic cover crop seed are identified in Table 3 below.

**Seed Availability.** Popular cover crops such as sorghum-sudangrass and cowpea have many named varieties and are widely available at local feed and seed stores and national seed retailers such as Johnny's Seeds. Frequently, seeds of these varieties are treated with a fungicide to prevent seed-borne diseases, but vendors are often very accommodating, and with advance notice they will work with suppliers to reserve seed prior to treatment. Certified organic cover crop seed is becoming increasingly available, but demand is greater than supply, and therefore seed can be expensive.

Cover crops with emerging popularity, such as velvetbean and sunn hemp, can be difficult to locate in large amounts. Many cover crops are sold as unnamed cultivars and are available from a limited number of sources. National retailers specializing in open pollinated seed are a good source for unnamed cultivars. Awareness of the diversity of cover crops has been facilitated by research efforts at universities and innovative producers. However, cover crop breeding efforts at universities and private industries is sporadic. Perhaps if demand for cover crops increases, there will be increased motivation to invest in research and development for crop improvement. For more information on retail sources of cover crop seeds, please refer to the online seed databases from the National Sustainable Agriculture Information Service (<http://www.attra.org>) and the Organic Materials Review Institute (<http://www.omri.org>).

### 3b. Sources of Cover Crops.

For small farmers, a number of seed saving and exchange organizations can facilitate the search for specialty seed. These organizations typically are not-for-profit and include Save Our Seed (<http://www.savingourseed.org>), Educational Concerns for Hunger Organization (ECHO) (<http://www.echonet.org>), and Seed Savers Exchange (<http://www.seedsavers.org>). Additional resources

not tabulated below include local seed and feed retailers, local Natural Resources Conservation Service (NRCS) office (<http://www.fl.nrcs.usda.gov>), and area farmers.

## Summary

In summary, integration of cover crops in a cropping system can have significant ecological impacts on the cropping system including crop establishment, nutrient availability and pest occurrence. Producers have many options in cover crop species selection and management, and objectives will be dictated by producer needs and production constraints. Cover crop management does require some preplanning, but the contributions to the farming system can be very beneficial. A plan for planting, mowing and termination is needed to avoid delays and costly errors. If you are new to cover crops, it's a good idea to experiment with a few well-selected species in an area large enough to accommodate the equipment you plan to use before you implement cover crops on the whole farm.

## Literature Cited

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**Table 1.** Annual cover crops used in Florida common to tropical and temperate Regions.

Cover Crop	Scientific name
<b>Tropical Legumes</b>	
Alfalfa	<i>Medicago sativa</i> L.
American jointvetch	<i>Aeschynomene americana</i> L.
Cowpea	<i>Vigna unguiculata</i> L. Walp.
Jackbean	<i>Canavalia ensiformis</i> L. DC.
Lablab	<i>Lablab purpureus</i> L.
Pigeon pea	<i>Cajanus cajan</i> L. Millspaugh
Soybean	<i>Glycine max</i> L. Merr.
Sunn hemp	<i>Crotalaria juncea</i> L.
Velvet bean	<i>Mucuna pruriens</i> , <i>M. deeringiana</i> Bort. Merr.
White lupin	<i>Lupinus albus</i> L.
<b>Temperate Legumes</b>	
Alfalfa	<i>Medicago sativa</i> L.
Alyce clover	<i>Alysicarpus ovalifolius</i> (Schumacher) J. Léonard
Austrian winter pea	<i>Pisum sativum</i> spp. <i>arvense</i> (L.) Poir.
Crimson clover	<i>Trifolium incarnatum</i> L.
Hairy vetch	<i>Vicia villosa</i> Roth
Ladino clover	<i>Trifolium repens</i> L.
Soybean	<i>Glycine max</i> L.
<b>Tropical Non-legumes</b>	
Millet, Japanese	<i>Echinochloa crus-galli</i> var. <i>frumentacea</i> Link
Millet, pearl	<i>Pennisetum tyoides</i> syn. <i>P. glaucum</i> (L.) R. Br.
Sorghum	<i>Sorghum bicolor</i> (L.) Moench spp. <i>bicolor</i>
Sorghum-sudangrass	<i>Sorghum bicolor</i> X <i>S. sudanense</i> (Piper) Stapf.
<b>Temperate Non-legumes</b>	
Annual ryegrass	<i>Lolium multiflorum</i> Lam.
Buckwheat	<i>Fagopyrum esculentum</i> Moench
German foxtail millet	<i>Setaria italica</i> (L.) Beauv.
Maize	<i>Zea mays</i> L.
Oats	<i>Avena sativa</i> L.
Millet, pearl	<i>Pennisetum glaucum</i> (L.) R. Br.
Rape	<i>Brassica napus</i> L.
Rye	<i>Secale cereale</i> L.
Texas panicum	<i>Panicum texanum</i> (Buckl.) R. Webster

**Table 2.** Recommended inoculants for legume cover crops.

Legume	Recommended Inoculant Group(s)
Aeschynomene Cowpeas Lespedeza	Cowpeas or Lespedeza
Crimson Clover Berseem Clover	Crimson or Berseem
Field Peas Hairy Vetch Woodypod Vetch	Pea or Vetch
Medics	Annual Medics
Red Clover White Clover	Red Clover or White Clover
Subterranean Clover	Subterranean Clover or Clover or Rose
Sweetclover	Alfalfa or Sweet Clover
Sunn Hemp	Cowpea EL (based on Abdul-Baki et al., 2001)
Velvetbean	Cowpea EL (based on Piper and Morse, 1928)

**Table 3.** A summary of contact information for US retailers that sell cover crop seed and rhizobium inoculant.

Southeast Retailers		
Seed Company	Products	Contact Information
Adams-Briscoe Seed Co., Inc.	Treated seed Untreated seed upon request Inoculant	325 East Second Street (shipping) PO Box 19 (mailing) Jackson, GA 30233-2266 Phone (770) 775-7826 or (877) 775-7826 Fax (770) 775-7122 <a href="http://www.abseed.com/">http://www.abseed.com/</a>
C. M. Payne and Sons, Inc.	Specialize in forage legumes	9410 Payne Rd Sebring, FL 33875-9716 Phone (863) 385-4642
Diamond R Fertilizer	Treated seed Untreated seed upon request Custom seed mixes	321 N. Hennis Rd. P.O. Box 12489 Winter Garden, FL 34787 Phone (407) 656-3007 Fax (407) 656-3903 <a href="http://www.diamond-r.com/locations.htm">http://www.diamond-r.com/locations.htm</a>
Haile-Dean Seed Co.	Treated seed	501 N. Hennis Rd. Winter Garden, FL 34787-2407 Phone (407) 877-3333 or (800) 423-7333
Mixon Seed Company	Treated seed	P.O. Box 1652 Orangeburg, SC 29116-1652 Phone (803) 531-1777 or (800) 922-1377 Fax: (803) 534-5027
Southern States	Treated seed Untreated seed upon request	Many locations throughout Florida Contact information available online: <a href="http://southernstates.findlocation.com">http://southernstates.findlocation.com</a>

**Table 3.** A summary of contact information for US retailers that sell cover crop seed and rhizobium inoculant.

Agrium United Agriculture Products	Treated seed Untreated seed upon request	Contact information for all locations in the state available online: <a href="http://www.uap.com/">http://www.uap.com/</a> 1-800-837-3426
Wise Seed Company, Inc.	All Untreated seed	930 Highway 630 West Frostproof, FL 33843-9771 Phone (863) 635-4473 Fax (863) 635-4880 <a href="http://wiseseed.net/">http://wiseseed.net/</a>
Wolf & Wolf Seeds	Organic seed Untreated seed	2747 Dorell Ave, Orlando, FL Phone (407) 481-0810 or (407) 481-0810 Fax (407) 481-0840 <a href="http://www.wolfseeds.com">http://www.wolfseeds.com</a>
<b>Northeast Retailers</b>		
Albert Lea Seedhouse, Inc.	Treated seed Untreated seed Organic seed	PO Box 127 1414 W. Main Street Albert Lea, MN 50007 Phone (800) 352-5247 Fax (507) 373-7032 <a href="http://www.alseed.com">http://www.alseed.com</a>
Buckwheat Growers Assoc. Of Minnesota	Untreated seed Organic seed GMO-free	206 Aldrich Avenue Wadena, MN 56482 Phone (218) 631-9212 <a href="http://www.buckwheatgrowers.com">http://www.buckwheatgrowers.com</a>
Fedco Seeds/Organic Growers Supply	Untreated Seed	PO Box 520 Waterville, ME 04903 Phone (207) 873-7333 <a href="http://www.fedcoseeds.com">http://www.fedcoseeds.com</a>
Johnnys Selected Seeds	Treated Seed Untreated seed Heirloom, Organic Seed and Inoculant	955 Benton Ave Winslow, ME 04901 Phone (877) 564-6697 or (207) 861-3900 <a href="http://www.johnnyseeds.com">http://www.johnnyseeds.com</a>
Midwestern Bio-Ag	Untreated seed GMO-free seed	PO Box 160 10955 Blackhawk Drive Blue Mounds, WI 53517 Phone (800) 327-6012 Fax (608) 437-4441 <a href="http://www.midwesternbioag.com">http://www.midwesternbioag.com</a>
EMD Crop BioScience <i>formerly Nitragin,</i> Inc.	Rhizobial inoculants	13100 West Lisbon Avenue Suite 600 Brookfield, WI 53005 Phone (262) 957-2122 Fax (262) 957-2121
North Country Organics	Untreated seed Organic seed	PO Box 372 203 Depot Street Bradford, VT 05033 Phone (802) 222-4277 Fax (802) 222-9661 <a href="http://www.norganics.com">http://www.norganics.com</a>
<b>Western Retailers</b>		

**Table 3.** A summary of contact information for US retailers that sell cover crop seed and rhizobium inoculant.

Bailey Seed Company	Untreated seed Organic seed	PO Box 12788 2430 SE McGilchrist Salem, OR 97302 Phone (800) 407-7713 or (503) 362-9700 Fax (503) 362-1705 <a href="http://www.baileysseed.com">http://www.baileysseed.com</a>
Bountiful Gardens	Untreated seed	18001 Shafer Ranch Road Willits, CA 95490-9626 Phone (707) 459-6410 Fax (707) 459-1925 <a href="http://www.bountifulgardens.org/">http://www.bountifulgardens.org/</a>
Harmony Farm Supply & Nursery	Untreated seed Organic seed	PO Box 460 3244 Hwy 116 N Sebastopol, CA 95472 Phone (707) 823-9125 Fax (707) 825-1734 <a href="http://www.harmonyfarm.com">http://www.harmonyfarm.com</a>
Kauffman Seeds	Treated seeds Untreated seeds	7508 S. Mayfield Road Haven, KS 67543 Phone (620) 465-2245 or (800) 634-2836 Fax (620) 465-3565
Planet Natural	Untreated seed Organic seed	1612 Gold Avenue Bozeman, MT 59715 Phone (800) 289-6656 (orders only) Fax (406) 587-0223 <a href="http://www.planetnatural.com">http://www.planetnatural.com</a>
Peaceful Valley Farm Supply	Untreated seed Organic seed	PO Box 2209 125 Clydesdale Court Grass Valley, CA 95945 Phone (530) 272-4769 or 1-888-784-1722 Fax: (530) 272-4794 <a href="http://www.groworganic.com">http://www.groworganic.com</a>
Territorial Seed Company	Untreated seed	PO Box 158 21 Palmer Ave. Cottage Grove, OR 97424-0061 Phone (541) 942-9547 or 1-800-626-0866 Fax (888) 657-3131 <a href="http://www.territorial-seed.com">http://www.territorial-seed.com</a>