

Natural Resources  
Conservation Service

Central National  
Technology  
Support Center

Plant Materials  
Program

May 2020

Plant Materials Technical Note No. 3

---

# Evaluation of Cool Season Cover Crops in the South-Central Region



---

# Acknowledgements

---

Issued May 2020

Plant Materials Technical Note No. 3 was prepared by: Alan Shadow, Manager, Melinda Brakie, Soil Conservationist, and Joseph Nesbit, Biological Science Technician, East Texas Plant Materials Center (PMC), Nacogdoches, TX; Brandon Carr, Manager, and Randy Kuehler, James E. “Bud” Smith PMC, Knox City, TX; Randy King, Manager (retired), Eddie Pratt, Biological Science Technician (retired), Jeremy Huff, Grazing Lands Specialist, Little Rock, AR; Aaron Pettit, Manager, Booneville, ARPMC; Ramona Garner, Plant Materials Specialist, Greensboro, NC (retired); Joel Douglas, Plant Materials Specialist, Fort Worth, TX; Virginia Moore, USDA-Agricultural Research Service, Beltsville, MD and North Carolina State University, Raleigh, NC; Steven Mirsky, Research Ecologist, USDA-Agricultural Research Service, Beltsville, MD.

The technical note benefitted from review by other NRCS technical staff.

All photos are credited to the USDA, Natural Resources Conservation Service, Plant Materials Program.

Suggested citation: U.S. Department of Agriculture, Natural Resources Conservation Service. 2020. Plant Materials Technical Note no. 3: Evaluation of Cool Season Cover Crops in the South-Central Region. Central National Technology Support Center, Fort Worth, TX.

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotope, American Sign Language, etc.) should contact the responsible Agency or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the Federal Relay Service at (800) 877-8339. Additionally, program information may be made available in languages other than English.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at [How to File a Program Discrimination Complaint](#) and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by: (1) mail: U.S. Department of Agriculture, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410; (2) fax: (202) 690-7442; or (3) email: [program.intake@usda.gov](mailto:program.intake@usda.gov).

USDA is an equal opportunity provider, employer, and lender.

---

# Preface

---

The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Plant Materials Program has been involved in the evaluation of conservation plants and planting technology for more than 80 years.

Plant Materials Centers (PMCs) in Booneville, AR; Knox City, TX and Nacogdoches, TX conducted a 2-year evaluation of 56 commercially available varieties of black oats, black seeded oats, cereal rye, crimson clover, daikon radish, hairy vetch, red clover, and winter/field pea to assess their adaptation and performance as cover crops in the South-Central PMC region. Information from the study will assist conservation planners and farmers in selecting varieties to meet the cover crop objectives of their production systems.

For additional information on specific species of plants mentioned in this publication, please see the USDA PLANTS database at: (<http://plants.usda.gov/java/>) or contact the nearest Plant Materials Center or plant materials specialist (<http://plant-materials.nrcs.usda.gov/contact/>) and/or the Land Grant Universities that serve the State. For specific information on soils and soil health, please see USDA NRCS soils website at: (<http://www.nrcs.usda.gov/wps/portal/nrcs/site/soils/home/>). Also, see technical resources on the National Plant Materials Program Web site at: (<http://www.plant-materials.nrcs.usda.gov/>).

## USDA NRCS Plant Materials Centers South-Central Region



## INTRODUCTION

Farmers rely on the latest crop variety trials to make informed decisions on planting the best adapted crop variety to maximize yield given their soils and production practices. With the ever-growing interest in planting cover crops, the USDA-Natural Resources Conservation Service (NRCS) Plant Materials Program initiated a nationwide study to identify adapted varieties of cool season annual species for cover cropping. With input from State Agronomists and State Soil Health Specialists, seven cool season annual cover crop species were identified for comparative evaluations using the network of NRCS Plant Materials Centers (PMCs). The PMCs assembled commercially available varieties of black oats, black seeded oats, cereal rye, crimson clover, daikon radish, hairy vetch, red clover, and winter/field pea to evaluate their performance and adaptation to different soils and geographical regions in the U.S. This technical note represents two years of data collected from PMCs in the region, performance may vary in other locations and years. Information from this study along with local research from university extension and other research entities can assist farmers and conservation planners in selecting adapted cool season annual varieties for their crop production systems. Additional information for each PMC location, including plant height and biomass (where collected), can be found in their final study reports hyperlinked at the end of this document.

## CHOOSING VARIETIES FOR CONSERVATION PLANTINGS

Commodity crops are chosen to fit local climate and soil conditions, and producers select varieties of commodity crops carefully to maximize performance and returns. For the producer, variety selection is a dynamic process that takes advantage of the many options available when deciding which varietal attributes best meet their needs. When choosing cover crop varieties, the producer may also take advantage of differences among varieties to best meet the goals of their production system.



When a cover crop species is chosen to meet a resource concern, a variety from that species may be selected to meet needs such as: 1) production of early or late cover, 2) early or late maturity, or 3) winter survival. By choosing varieties based on the production system, cover crop plans and systems can be developed to:

- time planting and termination dates to fit within the cropping system,
- develop mixes with species that mature at similar times to facilitate mechanical termination,
- use winterkill as a method of termination,
- use moderate levels of winterkill to manage competition of aggressive species, and
- use maturity dates to regulate the amount of cover crop residue.

Through selection of varieties that fit production systems, producers may overcome obstacles that discourage the use of cover crops.

## PROCEDURE

Cool season, annual, cover crop varieties were evaluated at NRCS PMCs in Booneville, AR; Knox City, TX; and Nacogdoches, TX in 2016-2017 and 2017-2018 (Table 1). Replicated plots were drilled in the fall using the pure live seed planting method (Table 2), and seeding rates were determined by averaging the recommended seeding rates from NRCS cover crop standards and specifications for uniform data analysis (Table 3). Legumes were inoculated with appropriate rhizobia prior to planting. Non-legumes were fertilized with 40 lbs. N/acre, and all entries received 60 lbs. P/acre and 30 lbs. K/acre both years. Cover crop varieties were evaluated for:

- Quick fall cover—Emergence at 14 days after planting: Excellent >90%, Good 61-90%, Fair 25-60%, Poor <25%,
- Fall stand quality—Yes is >65% emergence at 28 days after planting,
- Winter survival—Plant survival rating of Excellent >75%, Good 50-75%, Marginal 25-50%, Poor <25%,
- Maturity date—Days after planting to 50% bloom, data was grouped over the region by <165=Early, 165-190=Mid, >190=Late to identify varietal differences, and
- Disease and insect ranking—Damage observed was None, Low, Moderate, or High.

Table 1. Soil type, long-term yearly rainfall, average frost date, and low temperatures in Booneville, AR; Knox City, TX; and Nacogdoches, TX.

Plant Materials Center	Soil type	Average Yearly Rainfall (inches)	Average Frost Date	Low Temperature (F)	
				2016-2017	2017-2018
Booneville, AR	Leadvale silt loam	48	Nov 4	7	6
Knox City, TX	Altus fine sandy loam	26	Nov 15	10	7
Nacogdoches, TX	Woden fine sandy loam	51	Nov 27	16	10

Table 2. Planting date/year and planting method in Booneville, AR; Knox City, TX; and Nacogdoches, TX.

Plant Materials Center	Planting Date (Year)		Planting Method
	2016	2017	
Booneville, AR	Oct 5	Sept 27	Drill
Knox City, TX	Oct 4	Oct 11	Drill
Nacogdoches, TX	Oct 4	Oct 27	Drill

Table 3. Cover Crop planting rates at NRCS Plant Materials Centers in Booneville, AR; Knox City, TX; and Nacogdoches, TX.

Common Name	Species	PLS lbs./Acre
black oats	<i>Avena strigosa</i>	60
black seeded oats	<i>Avena sativa</i>	60
cereal rye	<i>Secale cereale</i>	100
crimson clover	<i>Trifolium incarnatum</i>	18
daikon radish	<i>Raphanus sativus</i>	9
hairy vetch	<i>Vicia villosa</i>	18
red clover	<i>Trifolium pratense</i>	9
winter/field pea	<i>Pisum sativum</i>	70

## COVER CROP PERFORMANCE AND RESULTS

### BLACK OATS/BLACK SEEDED OATS

**Description:** upright, winter annual grass. Height from 2 ½–5 feet. Black oats are not cold hardy and will winterkill at temperatures less than 19°F depending on growth stage. Black seeded oats are more cold tolerant than black oats, but susceptible to winter damage in northern locations. Prefers sandy or loamy soils but can also grow in heavy clay. It is used as a rotational cover crop either seeded alone or in a mixture.

**Benefits:** N scavenger, improves organic matter and soil structure, erosion control, weed suppressor, livestock forage.



*Black oats*

#### Performance of Black Oats/Black Seeded Oats Varieties

Cover Crop	Quick Fall Cover <sup>1/</sup>	Fall Stand Quality <sup>2/</sup>	Winter Survival <sup>3/</sup>	Maturity Date <sup>4/</sup>	Disease Ranking <sup>5/</sup>	Insect Ranking <sup>5/</sup>
Cosaque	Good	Yes	Good	Late	None/High <sup>d</sup>	None
Soil Saver	Fair/Excellent <sup>a</sup>	Yes	Poor/WK <sup>b</sup>	Mid <sup>c</sup>	Moderate <sup>c</sup>	None <sup>c</sup>

<sup>1/</sup>Quick fall cover—Emergence at 14 days after planting: Excellent >90%, Good 61-90%, Fair 25-60%, Poor <25%; <sup>2/</sup>Fall stand quality—Yes is >65% emergence at 28 days after planting; <sup>3/</sup>Winter survival—Plant survival rating of Excellent >75%, Good 50-75%, Marginal 25-50%, Poor <25%; <sup>4/</sup>Maturity date—Days after planting to 50% bloom: <165=Early, 165-190=Mid, >190=Late; and <sup>5/</sup>Disease and insect ranking—Damage observed was None, Low, Moderate, or High. WK=winterkilled.

<sup>a</sup>Excellent, quick fall cover in Booneville, AR; <sup>b</sup>Complete winterkill in Knox City and Booneville; <sup>c</sup>Maturity date and disease and insect ranking for Nacogdoches, TX; <sup>d</sup>No disease issues in Knox City, TX, high in Booneville, AR and Nacogdoches, TX.

**Expected Adaptation:** Soil Saver (black oats) and Cosaque (black seeded oat) rated good to excellent for quick fall cover and acceptable stand quality at all locations except Booneville, AR in 2017-2018. Cosaque exhibited good winter survival. Soil Saver had poor to marginal winter survival in Nacogdoches, TX but winterkilled in Booneville, AR and Knox City, TX both years. Foliar disease was notably high for Cosaque at 50% bloom in Nacogdoches, TX and Booneville, AR but not in Knox City, TX. Soil Saver is a good choice as a winterkilled cover crop in North-Central Texas, southwestern Oklahoma, western Arkansas and eastern Oklahoma. Cosaque is a good choice as an overwintering cover crop in North-Central Texas and southwestern Oklahoma.



*Cosaque and Soil Saver offers many benefits as cool season cover crops in parts of TX, OK and AR.*

## CEREAL RYE

**Description:** upright, cool season, annual grass. Height from 3 to 6 feet. Grows in a wide variety of climate and soil conditions but performs best in light loams or sandy soils. It also does well in clay soils.

**Benefits:** N scavenger, improves organic matter and soil structure, erosion control, weed suppressor, livestock forage.



*FL 401 cereal rye (background) matures earlier than other cereal rye varieties at the East Texas Plant Materials Center, Nacogdoches, TX.*

### Performance of Cereal Rye Varieties

Cover Crop	Quick Fall Cover <sup>1/</sup>	Fall Stand Quality <sup>2/</sup>	Winter Survival <sup>3/</sup>	Maturity Date <sup>4/</sup>	Disease Ranking <sup>5/</sup>	Insect Ranking <sup>5/</sup>
Aroostook	Excellent/Fair <sup>a</sup>	Yes	Excellent	Mid	Moderate	Low
Bates	Excellent/Good <sup>b</sup>	Yes	Excellent	Mid	Moderate	Low
Brasetto	Excellent-Poor <sup>c</sup>	Yes/No <sup>d</sup>	Excellent	Late	Moderate <sup>f</sup>	Low
Elbon	Excellent/Fair <sup>a</sup>	Yes	Excellent	Mid	Moderate	Low
FL 401	Excellent/Fair <sup>a</sup>	Yes	Good <sup>c</sup>	Early	Moderate	Low
Guardian	Excellent-Poor <sup>c</sup>	Yes/No <sup>d</sup>	Excellent	Late	Moderate <sup>f</sup>	Low
Hazlet	Excellent/Good <sup>b</sup>	Yes	Excellent	Late	Moderate <sup>f</sup>	Low
Maton	Excellent/Good <sup>b</sup>	Yes	Excellent	Mid	Moderate	Low
Maton II	Excellent/Fair <sup>a</sup>	Yes/No <sup>d</sup>	Excellent	Mid	Moderate	Low
Merced	Excellent/Fair <sup>a</sup>	Yes	Good <sup>c</sup>	Early	Moderate <sup>f</sup>	Low
Oklon	Excellent/Good <sup>b</sup>	Yes	Excellent	Mid	Moderate	Low
Rymin	Excellent/Good <sup>b</sup>	Yes	Good <sup>c</sup>	Late	Moderate <sup>f</sup>	Low
Wheeler	Excellent/Fair <sup>a</sup>	Yes	Excellent	Late	Moderate <sup>f</sup>	Low
Wintergrazer 70	Excellent/Good <sup>b</sup>	Yes	Excellent	Mid	Moderate <sup>g</sup>	Low
Wrens Abruzzi	Excellent/Good <sup>b</sup>	Yes	Excellent	Mid	Moderate	Low

<sup>1/</sup>Quick fall cover—Emergence at 14 days after planting: Excellent >90%, Good 61-90%, Fair 25-60%, Poor <25%; <sup>2/</sup>Fall stand quality—Yes is >65% emergence at 28 days after planting; <sup>3/</sup>Winter survival—Plant survival rating of Excellent >75%, Good 50-75%, Marginal 25-50%, Poor <25%; <sup>4/</sup>Maturity date—Days after planting to 50% bloom: <165=Early, 165-190=Mid, >190=Late; and <sup>5/</sup>Disease and insect ranking—Damage observed was None, Low, Moderate, or High.

<sup>a</sup>Fair quick fall cover in Knox City, TX; <sup>b</sup>Good in Knox City, TX; <sup>c</sup>Excellent in Booneville, AR, good in Nacogdoches, TX, poor in Knox City, TX; <sup>d</sup>Unacceptable in Knox City, TX; <sup>e</sup>Marginal performance in Booneville, AR in 2016-2017 and in Nacogdoches, TX 2017-2018; <sup>f</sup>High damage in Nacogdoches, TX; <sup>g</sup>High damage in Booneville, AR.

**Expected Adaptation:** Cereal rye varieties generally performed exceptionally well for quick fall cover, fall stand quality and winter survival in Booneville, AR and Nacogdoches, TX (except in 2017-2018). FL 401, Merced and Rymin were heavily winter damaged in Booneville, AR in 2016-2017. Varieties varied in fall cover and fall stand quality at Knox City, TX, but survival among varieties at this location was very good. Merced and FL 401 generally reached maturity (50% bloom) earlier than other varieties across locations, which may be good choices for producers interested in an early maturing cereal rye. Multiple varieties showed high disease damage in Nacogdoches, TX. In Booneville, AR, Wintergrazer was the only variety to show high disease damage. No significant insect damage was noted to any varieties across all locations.

## CRIMSON CLOVER

**Description:** cool season annual legume. Plants are generally densely hairy with a rosette of upright, usually unbranched stems, reaching 1 to 3 feet tall supported by a central taproot and many fibrous roots. Flowers produce nectar and pollen that attract European honeybees, as well as a wide variety of native bees.

**Benefits:** N source, improves organic matter and soil structure, erosion control, weed suppressor, livestock forage, pollinator habitat.



*Crimson clover*

### Performance of Crimson Clover Varieties

Cover Crop	Quick Fall Cover <sup>1/</sup>	Fall Stand Quality <sup>2/</sup>	Winter Survival <sup>3/</sup>	Maturity Date <sup>4/</sup>	Disease Ranking <sup>5/</sup>	Insect Ranking <sup>5/</sup>
AU Robin	Excellent/Fair <sup>a</sup>	Yes	Excellent	Mid	Moderate	Low
AU Sunrise	Excellent/Fair <sup>a</sup>	Yes	Excellent	Mid	Low	Moderate
AU Sunup	Poor/Good <sup>b</sup>	Yes/No <sup>d</sup>	Excellent	Early	Low	Low
Contea	Excellent/Fair <sup>c</sup>	Yes/No <sup>c</sup>	Excellent	Mid	Moderate	Low
Dixie	Excellent/Fair <sup>a</sup>	Yes	Excellent	Mid	Low	Low
Kentucky Pride	Excellent/Fair <sup>a</sup>	Yes	Excellent	Mid	Low	Low

<sup>1/</sup>Quick fall cover—Emergence at 14 days after planting: Excellent >90%, Good 61-90%, Fair 25-60%, Poor <25%; <sup>2/</sup>Fall stand quality—Yes is >65% emergence at 28 days after planting; <sup>3/</sup>Winter survival—Plant survival rating of Excellent >75%, Good 50-75%, Marginal 25-50%, Poor <25%; <sup>4/</sup>Maturity date—Days after planting to 50% bloom: <165=Early, 165-190=Mid, >190=Late; and <sup>5/</sup>Disease and insect ranking—Damage observed was None, Low, Moderate, or High.

<sup>a</sup>Excellent to good, quick fall cover in Booneville, AR and Nacogdoches, TX, fair in Knox City, TX; <sup>b</sup>Good, quick fall cover in Booneville, AR only; <sup>c</sup>Excellent quick fall cover in Booneville, AR, fair in Nacogdoches, TX and Knox City, TX;

<sup>d</sup>Unacceptable fall stand quality in Nacogdoches in 2017-2018 and in Knox City, TX both years; <sup>e</sup>Unacceptable fall stand quality in Nacogdoches, TX and Knox City, TX in 2017-2018.

**Expected Adaptation:** Most varieties provided excellent, quick fall cover and fall stand quality in Booneville, AR, but performance varied among varieties in Knox City, TX and Nacogdoches, TX. All varieties exhibited excellent winter survival across all locations. Maturity (50% bloom) dates for most varieties at each location were consistent, with Nacogdoches, TX maturing at an average of 151 days, Knox City, TX at 177 days and Booneville, AR at 197 days. Disease and insect damage were generally moderate to low across all locations.



*Dixie crimson clover (right) blooms earlier than Dynamite red clover in Nacogdoches, TX.*

## DAIKON RADISH

**Description:** winter annual with stiff, straight hairs near the base of the leaves. Seed stalks elongate from the rosette. Flowers in the spring with four pink, white, or lavender petals. Fruit resemble small bean pods. Radish develops a unique taproot which may reach depths of 24 inches or more. The upper 12-20 inches of the taproot thicken and can grow to 2 inches or more in diameter. Concorde, Control and Defender are oilseed radishes while other radishes are daikon/forage varieties.

**Benefits:** N scavenger, improves organic matter and soil structure, erosion control, weed suppressor, livestock forage.



*Daikon radish taproot*

### Performance of Daikon Radish Varieties

Cover Crop	Quick Fall Cover <sup>1/</sup>	Fall Stand Quality <sup>2/</sup>	Winter Survival <sup>3/</sup>	Maturity Date <sup>4/</sup>	Disease Ranking <sup>5/</sup>	Insect Ranking <sup>5/</sup>
Big Dog™	Excellent/Good <sup>a</sup>	Yes	Poor/WK <sup>g</sup>	Early	Low	Moderate
Concorde	Excellent-Fair <sup>b</sup>	Yes	Marginal/WK <sup>h</sup>	Early	Low	Moderate
Control	Excellent-Fair <sup>b</sup>	Yes	Marginal/WK <sup>h</sup>	Early	Moderate	Moderate
Defender	Fair/Excellent <sup>c</sup>	Yes/No <sup>e</sup>	Marginal/WK <sup>h</sup>	Early	Moderate	Moderate
Driller	Excellent/Good <sup>a</sup>	Yes	Poor/WK <sup>g</sup>	Early	Moderate	Moderate
Eco-Till™	Excellent-Fair <sup>b</sup>	Yes/No <sup>e</sup>	Poor/WK <sup>h</sup>	Early	Low	Moderate
Graza	Poor	Yes/No <sup>f</sup>	Good/WK <sup>h</sup>	Early	Low	Moderate
Groundhog™	Excellent/Good <sup>a</sup>	Yes	Poor/WK <sup>g</sup>	Early	Moderate	Moderate
Lunch	Excellent-Fair <sup>d</sup>	Yes/No <sup>e</sup>	Poor/WK <sup>g</sup>	Early	Low	Moderate
Nitro™	Excellent/Good <sup>a</sup>	Yes	Poor/WK <sup>g</sup>	Early	Low	Moderate
Sodbuster	Excellent-Fair <sup>d</sup>	Yes/No <sup>e</sup>	Poor/WK <sup>g</sup>	Early	Low	Moderate
Tillage®	Excellent-Fair <sup>b</sup>	Yes	Poor/WK <sup>g</sup>	Early	Low	Moderate

<sup>1/</sup>Quick fall cover—Emergence at 14 days after planting: Excellent >90%, Good 61-90%, Fair 25-60%, Poor <25%; <sup>2/</sup>Fall stand quality—Yes is >65% emergence at 28 days after planting; <sup>3/</sup>Winter survival—Plant survival rating of Excellent >75%, Good 50-75%, Marginal 25-50%, Poor <25%; <sup>4/</sup>Maturity date—Days after planting to 50% bloom: <165=Early, 165-190=Mid, >190=Late; and <sup>5/</sup>Disease and insect ranking, Nacogdoches, TX only—Damage observed was None, Low, Moderate, or High. WK=winterkilled.

<sup>a</sup>Excellent quick fall cover in AR; good in Nacogdoches and Knox City, TX; <sup>b</sup>Excellent quick fall cover in AR, good in Nacogdoches, fair in Knox City; <sup>c</sup>Excellent in Booneville, AR only; <sup>d</sup>Excellent quick fall cover in AR, good in Knox City and fair in Nacogdoches; <sup>e</sup>Acceptable fall stand quality all locations except Nacogdoches, TX in 2017-2018; <sup>f</sup>Acceptable fall stand quality at all locations except Nacogdoches in 2016-2017 and Knox City in 2017-2018; <sup>g</sup>Winterkilled in Knox City, TX and Booneville, AR both years and in Nacogdoches in 2016-2017 but good to excellent winter survival in Nacogdoches in 2017-2018; <sup>h</sup>Marginal to poor survival at Booneville both years and good to excellent survival in Nacogdoches in 2017-2018, complete WK in Knox City, TX both years.

**Expected Adaptation:** Daikon radish varieties varied across location for quick fall cover and stand quality, except Graza, which failed to provide early cover and stand quality but had good winter survival in Booneville, AR both years. Winter survival varied from poor to complete winterkill, except in 2017-2018 in Nacogdoches, TX where winter survival was excellent to good for all varieties. In Nacogdoches, TX, disease and insect ranking varied from low to moderate. Daikon radish may be a good choice for producers who need a winterkilled cover crop to add to their farming system, but variety selection must be considered.



*Daikon radish varieties provided good fall cover and stand quality in Knox City, TX but winterkilled.*

## HAIRY VETCH

**Description:** trailing or climbing, winter annual, legume with stems 2 to 5 feet. Leaves are terminated by branched tendrils. Stems and leaves are usually covered with soft woolly fuzz. Flowers in clusters of 10 to 40 and usually violet to purple colored. Lana is a variety of woollypod vetch (*Vicia villosa* ssp. *dasycarpa*) included in this study because of its similarity in usage to hairy vetch.

**Benefits:** N source, weed suppressor, improves organic matter, soil structure, pollinator habitat.



Hairy vetch flowers

### Performance of Hairy Vetch Varieties

Cover Crop	Quick Fall Cover <sup>1/</sup>	Fall Stand Quality <sup>2/</sup>	Winter Survival <sup>3/</sup>	Maturity Date <sup>4/</sup>	Disease Ranking <sup>5/</sup>	Insect Ranking <sup>5/</sup>
CCS Groff	Excellent/Fair <sup>a</sup>	Yes/No <sup>c</sup>	Excellent/Good <sup>d</sup>	Late	None/Moderate <sup>e</sup>	None
Lana	Good/Fair <sup>b</sup>	Yes/No <sup>c</sup>	Excellent	Mid	None/Moderate <sup>e</sup>	Low
Purple Bounty	Excellent/Fair <sup>a</sup>	Yes/No <sup>c</sup>	Excellent/Good <sup>d</sup>	Mid	None/Moderate <sup>e</sup>	None
Purple Prosperity	Excellent/Fair <sup>a</sup>	Yes/No <sup>c</sup>	Excellent/Good <sup>d</sup>	Mid	None	None
TNT	Excellent/Fair <sup>a</sup>	Yes	Excellent	Late	None/Moderate <sup>f</sup>	Low
Villana	Excellent/Fair <sup>a</sup>	Yes/No <sup>c</sup>	Excellent/Good <sup>d</sup>	Late	None	None

<sup>1/</sup>Quick fall cover—Emergence at 14 days after planting: Excellent >90%, Good 61-90%, Fair 25-60%, Poor <25%; <sup>2/</sup>Fall stand quality—Yes is >65% emergence at 28 days after planting; <sup>3/</sup>Winter survival—Plant survival rating of Excellent >75%, Good 50-75%, Marginal 25-50%, Poor <25%; <sup>4/</sup>Maturity date—Days after planting to 50% bloom: <165=Early, 165-190=Mid, >190=Late; and <sup>5/</sup>Disease and insect ranking—Damage observed was None, Low, Moderate, or High.

<sup>a</sup>Excellent, quick fall cover in Booneville, AR, fair to good in Nacogdoches, TX and Knox City, TX in 2016-2017 and poor in Nacogdoches and Knox City in 2017-2018; <sup>b</sup>Good, quick fall cover in Booneville, AR both years, good in Nacogdoches, TX, and Knox City, TX in 2016-2017, and poor to fair in Nacogdoches, TX and Knox City, TX in 2017-2018; <sup>c</sup>Unacceptable in Nacogdoches, TX in 2017-2018; <sup>d</sup>Good winter survival in Nacogdoches, TX; <sup>e</sup>Moderate disease damage in Booneville, AR in 2016-2017; <sup>f</sup>Moderate disease damage in Nacogdoches, TX in 2017-2018.

**Expected Adaptation:** Most varieties provided good to excellent, quick fall cover with acceptable fall stand quality but varied among locations and years. TNT provided the best fall stand quality across locations and years. All varieties had excellent to good winter survival and reached maturity (50% bloom) on average between 170 to 200 days after planting. Disease and insect issues were none to moderate among varieties with Booneville, AR reporting the highest disease damage on CCS Groff and Purple Bounty.



TNT blooming in late spring in Nacogdoches, TX.

## RED CLOVER

**Description:** biennial or short-lived perennial that grows as one of two types: medium (double-cut) or mammoth (single-cut). Plants grow from crowns with hollow, hairy stems and branches. Stem lengths of medium and mammoth types average 18 inches and 24 to 30 inches, respectively. Each leaf consists of a slender stalk bearing 3 leaflets. Flowers borne in compact clusters or heads and are usually rose-pink in color.

**Benefits:** N source, improves organic matter and soil structure, erosion control, weed suppressor, livestock forage, pollinator habitat.



*Red clover*

### Performance of Red Clover Varieties

Cover Crop	Quick Fall Cover <sup>1/</sup>	Fall Stand Quality <sup>2/</sup>	Winter Survival <sup>3/</sup>	Maturity Date <sup>4/</sup>	Disease Ranking <sup>5/</sup>	Insect Ranking <sup>5/</sup>
Cinnamon Plus	Excellent-Poor <sup>a</sup>	Yes/No <sup>c</sup>	Excellent/Marginal <sup>e</sup>	Late	None	Low
Cyclone II	Excellent-Poor <sup>a</sup>	Yes/No <sup>c</sup>	Excellent/Marginal <sup>e</sup>	Late	None	Low
Dynamite	Excellent-Poor <sup>a</sup>	Yes/No <sup>c</sup>	Excellent/Good <sup>e</sup>	Late	None	Low
Freedom	Good-Poor <sup>b</sup>	Yes/No <sup>c</sup>	Excellent/Good <sup>e</sup>	Late	None	Low
Kenland	Good-Poor <sup>b</sup>	Yes/No <sup>d</sup>	Excellent/Good <sup>e</sup>	Late	None	Low
Mammoth	Excellent-Poor <sup>a</sup>	Yes/No <sup>d</sup>	Excellent/Marginal <sup>e</sup>	Late	None	Low
Starfire II	Excellent-Poor <sup>a</sup>	Yes/No <sup>c</sup>	Excellent/Good <sup>e</sup>	Late	None	Low
Wildcat	Excellent-Poor <sup>a</sup>	Yes/No <sup>c</sup>	Excellent/Good <sup>e</sup>	Late	None	Low

<sup>1/</sup>Quick fall cover—Emergence at 14 days after planting: Excellent >90%, Good 61-90%, Fair 25-60%, Poor <25%; <sup>2/</sup>Fall stand quality—Yes is >65% emergence at 28 days after planting; <sup>3/</sup>Winter survival—Plant survival rating of Excellent >75%, Good 50-75%, Marginal 25-50%, Poor <25%; <sup>4/</sup>Maturity date—Days after planting to 50% bloom: <165=Early, 165-190=Mid, >190=Late; and <sup>5/</sup>Disease and insect ranking—Damage observed was None, Low, Moderate, or High.

<sup>a</sup>Excellent to good, quick fall cover in Booneville, AR both years, fair to good in Nacogdoches, TX in 2016-2017, poor in Nacogdoches, TX in 2017-2018, and poor in Knox City, TX both years; <sup>b</sup>Good to excellent quick fall cover in Booneville, AR both years, good to poor in Nacogdoches, TX and poor in Knox City, TX both years; <sup>c</sup>Unacceptable in Nacogdoches, TX in 2017-2018 and Knox City, TX both years; <sup>d</sup>Unacceptable fall stand quality in Nacogdoches, TX and Knox City both years; <sup>e</sup>Excellent winter survival in Booneville, AR both years, Nacogdoches, TX and Knox City, TX in 2017-2018, marginal to good in Nacogdoches, TX and Knox City, TX in 2016-2017.

**Expected Adaptation:** Red clover varieties generally provided good to excellent quick fall cover, fall stand quality and winter survival in Booneville, AR, but varied among varieties in Nacogdoches, TX and Knox City, TX. Most of the varieties did not exhibit desirable fall cover or stand quality in Nacogdoches, TX and Knox City, TX. Most varieties exhibited excellent to good winter survival and reached maturity (50% bloom) between 190 and 220 days after planting. Disease and insect damage were none to low among varieties across locations and years.



*Starfire II red clover blooming at the East Texas Plant Materials Center.*

## WINTER/FIELD PEA

**Description:** winter annual, legume with bluish-green waxy vines. Vines can reach 9 ft long, but modern varieties have shorter vines, about 2 feet long. Stems are hollow and leaves alternate, pinnately compound. Flowers white, purple or pink. Winter pea varieties include Frost Master, Lynx, Survivor 15, Whistler, and Windham. Spring pea varieties include Arvica 4010, Dunn, and Maxum.

**Benefits:** N source, improves organic matter and soil structure, erosion control, weed suppressor, livestock forage, pollinator habitat.



Field pea

### Performance of Winter/Field Pea Varieties

Cover Crop	Quick Fall Cover <sup>1/</sup>	Fall Stand Quality <sup>2/</sup>	Winter Survival <sup>3/</sup>	Maturity Date <sup>4/</sup>	Disease Ranking <sup>5/</sup>	Insect Ranking <sup>5/</sup>
Arvica 4010	Excellent-Poor <sup>a</sup>	Yes/No <sup>b</sup>	Poor/Good <sup>c</sup>	Early	Moderate <sup>i</sup>	None
Dunn	Excellent-Poor <sup>a</sup>	Yes/No <sup>b</sup>	Poor/Good <sup>c</sup>	Early	Moderate <sup>i</sup>	None
Frost Master	Excellent-Poor <sup>a</sup>	Yes/No <sup>b</sup>	Marginal/Good <sup>d</sup>	Mid	Moderate/High <sup>j</sup>	None
Lynx	Excellent-Poor <sup>a</sup>	Yes/No <sup>b</sup>	Poor/Good <sup>e</sup>	Mid	Moderate <sup>i</sup>	None
Maxum	Excellent-Poor <sup>a</sup>	Yes/No <sup>b</sup>	Poor/Good <sup>c</sup>	Early	Moderate <sup>i</sup>	None
Survivor 15	Excellent-Poor <sup>a</sup>	Yes/No <sup>b</sup>	Poor/Good <sup>f</sup>	Late	Moderate <sup>i</sup>	None
Whistler	Excellent-Poor <sup>a</sup>	Yes/No <sup>b</sup>	Poor/Good <sup>g</sup>	Mid	Moderate <sup>i</sup>	None
Windham	Excellent-Poor <sup>a</sup>	Yes/No <sup>b</sup>	Poor/Good <sup>h</sup>	Mid	Moderate/High <sup>j</sup>	None

<sup>1/</sup>Quick fall cover—Emergence at 14 days after planting: Excellent >90%, Good 61-90%, Fair 25-60%, Poor <25%; <sup>2/</sup>Fall stand quality—Yes is >65% emergence at 28 days after planting; <sup>3/</sup>Winter survival—Plant survival rating of Excellent >75%, Good 50-75%, Marginal 25-50%, Poor <25%; <sup>4/</sup>Maturity date—Days after planting to 50% bloom: <165=Early, 165-190=Mid, >190=Late; and <sup>5/</sup>Disease and insect ranking—Damage observed was None, Low, Moderate, or High.

<sup>a</sup>Excellent, quick fall cover in Booneville, AR both years and in Nacogdoches, TX in 2016-2017; fair to good in Knox City, TX both years, poor in Nacogdoches in 2017-2018; <sup>b</sup>Acceptable stand quality at all locations, except Nacogdoches, TX in 2016-2017; <sup>c</sup>Poor winter survival in Booneville and Knox City, TX both years and Nacogdoches, TX in 2016-2017, good in Nacogdoches, TX in 2016-2017; <sup>d</sup>Marginal to poor winter survival in Booneville, good to excellent in Nacogdoches, TX and Knox City, TX; <sup>e</sup>Poor winter survival in Booneville in 2016-2017; good to excellent in Nacogdoches, TX and Knox City, TX both years; <sup>f</sup>Excellent to good winter survival at all locations and years and poor in Booneville, AR in 2017-2018; <sup>g</sup>Poor winter survival in Booneville, AR in 2016-2017; good to excellent winter survival Nacogdoches, TX and Knox City, TX both years and in Booneville, AR in 2017-2018; <sup>h</sup>Excellent winter survival in Booneville, AR in 2016-2017 and good to excellent winter survival Nacogdoches and Knox City both years, marginal in Booneville, AR in 2017-2018; <sup>i</sup>Moderate in Nacogdoches, TX both years; <sup>j</sup>High in Knox City, TX 2016-2017.

**Expected Adaptation:** Field pea varieties had excellent to good, quick fall cover and acceptable fall stand quality at all locations except Nacogdoches, TX in 2017-2018. Maturity date (50% bloom) varied among varieties and locations from ~100 to ~215 days after planting. Foliar disease was mainly an issue among winter surviving varieties in Nacogdoches, TX and Knox City, TX in 2016-2017.

## Comparison of Cool Season Cover Crops and Varieties in the South-Central Region

Cover Crop	Quick Fall Cover <sup>1/</sup>	Fall Stand Quality <sup>2/</sup>	Winter Survival <sup>3/</sup>	Maturity Date <sup>4/</sup>	Disease Ranking <sup>5/</sup>	Insect Ranking <sup>5/</sup>
<b>BLACK OATS</b>						
Soil Saver	Fair/Excellent <sup>a</sup>	Yes	Poor/WK <sup>b</sup>	Mid <sup>c</sup>	Fair <sup>c</sup>	None <sup>c</sup>
<sup>a</sup> Excellent, quick fall cover in Booneville, AR; <sup>b</sup> Complete winterkill in Knox City, TX and Booneville, AR; <sup>c</sup> Maturity date and disease and insect ranking for Nacogdoches, TX.						
<b>BLACK SEEDED OATS</b>						
Cosaque	Good	Yes	Good	Late	None/High <sup>a</sup>	None
<sup>a</sup> No disease issues in Knox City, TX, high in Booneville, AR and Nacogdoches, TX.						
<b>CEREAL RYE</b>						
Aroostook	Excellent/Fair <sup>a</sup>	Yes	Excellent	Mid	Moderate	Low
Bates	Excellent/Good <sup>b</sup>	Yes	Excellent	Mid	Moderate	Low
Brasetto	Excellent-Poor <sup>c</sup>	Yes/No <sup>d</sup>	Excellent	Late	Moderate <sup>f</sup>	Low
Elbon	Excellent/Fair <sup>a</sup>	Yes	Excellent	Mid	Moderate	Low
FL 401	Excellent/Fair <sup>a</sup>	Yes	Good <sup>e</sup>	Early	Moderate	Low
Guardian	Excellent-Poor <sup>c</sup>	Yes/No <sup>d</sup>	Excellent	Late	Moderate <sup>f</sup>	Low
Hazlet	Excellent/Good <sup>b</sup>	Yes	Excellent	Late	Moderate <sup>f</sup>	Low
Maton	Excellent/Good <sup>b</sup>	Yes	Excellent	Mid	Moderate	Low
Maton II	Excellent/Fair <sup>a</sup>	Yes/No <sup>d</sup>	Excellent	Mid	Moderate	Low
Merced	Excellent/Fair <sup>a</sup>	Yes	Good <sup>e</sup>	Early	Moderate <sup>f</sup>	Low
Oklon	Excellent/Good <sup>b</sup>	Yes	Excellent	Mid	Moderate	Low
Rymin	Excellent/Good <sup>b</sup>	Yes	Good <sup>e</sup>	Late	Moderate <sup>f</sup>	Low
Wheeler	Excellent/Fair <sup>a</sup>	Yes	Excellent	Late	Moderate <sup>f</sup>	Low
Wintergrazer 70	Excellent/Good <sup>b</sup>	Yes	Excellent	Mid	Moderate <sup>g</sup>	Low
Wrens Abruzzi	Excellent/Good <sup>b</sup>	Yes	Excellent	Mid	Moderate	Low
<sup>a</sup> Fair quick fall cover in Knox City, TX; <sup>b</sup> Good in Knox City, TX; <sup>c</sup> Excellent in Booneville, AR, good in Nacogdoches, TX, poor in Knox City, TX; <sup>d</sup> Unacceptable in Knox City, TX; <sup>e</sup> Marginal performance in Booneville, AR in 2016-2017 and in Nacogdoches, TX 2017-2018; <sup>f</sup> High damage in Nacogdoches; <sup>g</sup> High damage in Booneville, AR.						
<b>CRIMSON CLOVER</b>						
AU Robin	Excellent/Fair <sup>a</sup>	Yes	Excellent	Mid	Moderate	Low
AU Sunrise	Excellent/Fair <sup>a</sup>	Yes	Excellent	Mid	Low	Moderate
AU Sunup	Poor/Good <sup>b</sup>	Yes/No <sup>d</sup>	Excellent	Early	Low	Low
Contea	Excellent/Fair <sup>c</sup>	Yes/No <sup>c</sup>	Excellent	Mid	Moderate	Low
Dixie	Excellent/Fair <sup>a</sup>	Yes	Excellent	Mid	Low	Low
Kentucky Pride	Excellent/Fair <sup>a</sup>	Yes	Excellent	Mid	Low	Low
<sup>a</sup> Excellent to good, quick fall cover in Booneville, AR and Nacogdoches, TX, fair in Knox City, TX; <sup>b</sup> Good, quick fall cover in Booneville, AR only; <sup>c</sup> Excellent quick fall cover in Booneville, AR, fair in Nacogdoches, TX and Knox City, TX; <sup>d</sup> Unacceptable fall stand quality in Nacogdoches, TX in 2017-2018 and in Knox City, TX both years; <sup>e</sup> Unacceptable fall stand quality in Nacogdoches, TX and Knox City, TX in 2017-2018.						
<sup>1/</sup> Quick fall cover—Emergence at 14 days after planting: Excellent >90%, Good 61-90%, Fair 25-60%, Poor <25%; <sup>2/</sup> Fall stand quality—Yes is >65% emergence at 28 days after planting; <sup>3/</sup> Winter survival—Plant survival rating of Excellent 75%, Good 50-75%, Marginal 25-50%, Poor <25%; <sup>4/</sup> Maturity date—Days after planting to 50% bloom: <165=Early, 165-190=Mid, >190=Late; and <sup>5/</sup> Disease and insect ranking—Damage observed was None, Low, Moderate, or High.						

## Comparison of Cool Season Cover Crops and Varieties in the South-Central Region (Cont.)

Cover Crop	Quick Fall Cover <sup>1/</sup>	Fall Stand Quality <sup>2/</sup>	Winter Survival <sup>3/</sup>	Maturity Date <sup>4/</sup>	Disease Ranking <sup>5</sup>	Insect Ranking <sup>5/</sup>
<b>DAIKON RADISH</b>						
Big Dog™	Excellent/Good <sup>a</sup>	Yes	Poor/WK <sup>g</sup>	Early	Low	Moderate
Concorde	Excellent-Fair <sup>b</sup>	Yes	Marginal/WK <sup>h</sup>	Early	Low	Moderate
Control	Excellent-Fair <sup>b</sup>	Yes	Marginal/WK <sup>h</sup>	Early	Moderate	Moderate
Defender	Fair/Excellent <sup>c</sup>	Yes/No <sup>e</sup>	Marginal/WK <sup>h</sup>	Early	Moderate	Moderate
Driller	Excellent/Good <sup>a</sup>	Yes	Poor/WK <sup>g</sup>	Early	Moderate	Moderate
Eco-Till™	Excellent-Fair <sup>b</sup>	Yes/No <sup>e</sup>	Poor/WK <sup>h</sup>	Early	Low	Moderate
Graza	Poor	Yes/No <sup>f</sup>	Good/WK <sup>h</sup>	Early	Low	Moderate
Groundhog™	Excellent/Good <sup>a</sup>	Yes	Poor/WK <sup>g</sup>	Early	Moderate	Moderate
Lunch	Excellent-Fair <sup>d</sup>	Yes/No <sup>e</sup>	Poor/WK <sup>g</sup>	Early	Low	Moderate
Nitro™	Excellent/Good <sup>a</sup>	Yes	Poor/WK <sup>g</sup>	Early	Low	Moderate
Sodbuster	Excellent-Fair <sup>d</sup>	Yes/No <sup>e</sup>	Poor/WK <sup>g</sup>	Early	Low	Moderate
Tillage®	Excellent-Fair <sup>b</sup>	Yes	Poor/WK <sup>g</sup>	Early	Low	Moderate
<sup>a</sup> Excellent quick fall cover in AR; good in Nacogdoches and Knox City, TX; <sup>b</sup> Excellent quick fall cover in AR, good in Nacogdoches, fair in Knox City; <sup>c</sup> Excellent in Booneville, AR only; <sup>d</sup> Excellent quick fall cover in AR, good in Knox City and fair in Nacogdoches; <sup>e</sup> Acceptable fall stand quality all locations except Nacogdoches, TX in 2017-2018; <sup>f</sup> Acceptable fall stand quality at all locations except Nacogdoches in 2016-2017 and Knox City in 2017-2018; <sup>g</sup> Winterkill in Knox City, TX and Booneville, AR both years and in Nacogdoches in 2016-2017 but good to excellent winter survival in Nacogdoches in 2017-2018; <sup>h</sup> Marginal to poor survival at Booneville both years and good to excellent survival in Nacogdoches in 2017-2018, complete WK in Knox City, TX both years.						
<b>HAIRY VETCH</b>						
CCS Groff	Excellent/Fair <sup>a</sup>	Yes/No <sup>c</sup>	Excellent/Good <sup>d</sup>	Late	None/Moderate <sup>e</sup>	None
Lana	Good/Fair <sup>b</sup>	Yes/No <sup>c</sup>	Excellent	Mid	None/Moderate <sup>e</sup>	Low
Purple Bounty	Excellent/Fair <sup>a</sup>	Yes/No <sup>c</sup>	Excellent/Good <sup>d</sup>	Mid	None/Moderate <sup>e</sup>	None
Purple Prosperity	Excellent/Fair <sup>a</sup>	Yes/No <sup>c</sup>	Excellent/Good <sup>d</sup>	Mid	None	None
TNT	Excellent/Fair <sup>a</sup>	Yes	Excellent	Late	None/Moderate <sup>f</sup>	Low
Villana	Excellent/Fair <sup>a</sup>	Yes/No <sup>c</sup>	Excellent/Good <sup>d</sup>	Late	None	None
<sup>a</sup> Excellent, quick fall cover in Booneville, AR, fair to good in Nacogdoches, TX and Knox City, TX in 2016-2017 and poor in Nacogdoches, TX and Knox City, TX in 2017-2018; <sup>b</sup> Good, quick fall cover in Booneville, AR both years, good in Nacogdoches, TX, and Knox City, TX in 2016-2017, and poor to fair in Nacogdoches, TX and Knox City, TX in 2017-2018; <sup>c</sup> Unacceptable in Nacogdoches, TX in 2017-2018; <sup>d</sup> Good winter survival in Nacogdoches, TX; <sup>e</sup> Moderate disease damage in Booneville, AR in 2016-2017; <sup>f</sup> Moderate disease damage in Nacogdoches, TX in 2017-2018.						
<sup>1/</sup> Quick fall cover—Emergence at 14 days after planting: Excellent >90%, Good 61-90%, Fair 25-60%, Poor <25%; <sup>2/</sup> Fall stand quality—Yes is >65% emergence at 28 days after planting; <sup>3/</sup> Winter survival—Plant survival rating of Excellent >75%, Good 50-75%, Marginal 25-50%, Poor <25%; <sup>4/</sup> Maturity date—Days after planting to 50% bloom: <165=Early, 165-190=Mid, >190=Late; and <sup>5/</sup> Disease and insect ranking—Damage observed was None, Low, Moderate, or High. WK=winterkilled.						

## Comparison of Cool Season Cover Crops and Varieties in the South-Central Region (Cont.)

Cover Crop	Quick Fall Cover <sup>1/</sup>	Fall Stand Quality <sup>2/</sup>	Winter Survival <sup>3/</sup>	Maturity Date <sup>4/</sup>	Disease Ranking <sup>5</sup>	Insect Ranking <sup>5/</sup>
<b>RED CLOVER</b>						
Cinnamon Plus	Excellent-Poor <sup>a</sup>	Yes/No <sup>c</sup>	Excellent/Marginal <sup>e</sup>	Late	None	Low
Cyclone II	Excellent-Poor <sup>a</sup>	Yes/No <sup>c</sup>	Excellent/Marginal <sup>e</sup>	Late	None	Low
Dynamite	Excellent-Poor <sup>a</sup>	Yes/No <sup>c</sup>	Excellent/Good <sup>e</sup>	Late	None	Low
Freedom	Good-Poor <sup>b</sup>	Yes/No <sup>c</sup>	Excellent/Good <sup>e</sup>	Late	None	Low
Kenland	Good-Poor <sup>b</sup>	Yes/No <sup>d</sup>	Excellent/Good <sup>e</sup>	Late	None	Low
Mammoth	Excellent-Poor <sup>a</sup>	Yes/No <sup>d</sup>	Excellent/Marginal <sup>e</sup>	Late	None	Low
Starfire II	Excellent-Poor <sup>a</sup>	Yes/No <sup>c</sup>	Excellent/Good <sup>e</sup>	Late	None	Low
Wildcat	Excellent-Poor <sup>a</sup>	Yes/No <sup>c</sup>	Excellent/Good <sup>e</sup>	Late	None	Low
<sup>a</sup> Excellent to good, quick fall cover in Booneville, AR both years, fair to good in Nacogdoches, TX in 2016-2017, poor in Nacogdoches, TX in 2017-2018, and poor in Knox City, TX both years; <sup>b</sup> Good to excellent quick fall cover in Booneville, AR both years, good to poor in Nacogdoches, TX and poor in Knox City, TX both years; <sup>c</sup> Unacceptable in Nacogdoches, TX in 2017-2018 and Knox City, TX both years; <sup>d</sup> Unacceptable fall stand quality in Nacogdoches, TX and Knox City both years; <sup>e</sup> Excellent winter survival in Booneville, AR both years, Nacogdoches, TX and Knox City, TX in 2017-2018, marginal to good in Nacogdoches and Knox City, TX in 2016-2017.						
<b>WINTER/FIELD PEA</b>						
Arvica 4010	Excellent-Poor <sup>a</sup>	Yes/No <sup>b</sup>	Poor/Good <sup>c</sup>	Early	Moderate <sup>i</sup>	None
Dunn	Excellent-Poor <sup>a</sup>	Yes/No <sup>b</sup>	Poor/Good <sup>c</sup>	Early	Moderate <sup>i</sup>	None
Frost Master	Excellent-Poor <sup>a</sup>	Yes/No <sup>b</sup>	Marginal/Good <sup>d</sup>	Mid	Moderate/High <sup>j</sup>	None
Lynx	Excellent-Poor <sup>a</sup>	Yes/No <sup>b</sup>	Poor/Good <sup>e</sup>	Mid	Moderate <sup>i</sup>	None
Maxum	Excellent-Poor <sup>a</sup>	Yes/No <sup>b</sup>	Poor/Good <sup>c</sup>	Early	Moderate <sup>i</sup>	None
Survivor 15	Excellent-Poor <sup>a</sup>	Yes/No <sup>b</sup>	Poor/Good <sup>f</sup>	Late	Moderate <sup>i</sup>	None
Whistler	Excellent-Poor <sup>a</sup>	Yes/No <sup>b</sup>	Poor/Good <sup>g</sup>	Mid	Moderate <sup>i</sup>	None
Windham	Excellent-Poor <sup>a</sup>	Yes/No <sup>b</sup>	Poor/Good <sup>h</sup>	Mid	Moderate/High <sup>j</sup>	None
<sup>a</sup> Excellent, quick fall cover in Booneville, AR both years and in Nacogdoches, TX in 2016-2017; fair to good in Knox City, TX both years, poor in Nacogdoches, TX in 2017-2018; <sup>b</sup> Acceptable stand quality at all locations, except Nacogdoches, TX in 2016-2017; <sup>c</sup> Poor winter survival in Booneville, AR and Knox City, TX both years and Nacogdoches, TX in 2016-2017, good in Nacogdoches, TX in 2016-2017; <sup>d</sup> Marginal to poor winter survival in Booneville, AR, good to excellent in Nacogdoches, TX and Knox City, TX both years; <sup>e</sup> Poor winter survival in Booneville, AR in 2016-2017; good to excellent in Nacogdoches, TX and Knox City, TX both years; <sup>f</sup> Excellent to good winter survival at all locations and years and poor in Booneville in 2017-2018; <sup>g</sup> Poor winter survival in Booneville, AR in 2016-2017; good to excellent winter survival Nacogdoches, TX and Knox City, TX both years and in Booneville, AR in 2017-2018; <sup>h</sup> Excellent winter survival in Booneville in 2016-2017 and good to excellent winter survival Nacogdoches, TX and Knox City, TX both years, marginal in Booneville, AR in 2017-2018; <sup>i</sup> Moderate in Nacogdoches, TX both years; <sup>j</sup> High in Knox City, TX 2016-2017.						
<sup>1/</sup> Quick fall cover—Emergence at 14 days after planting: Excellent >90%, Good 61-90%, Fair 25-60%, Poor <25%; <sup>2/</sup> Fall stand quality—Yes is >65% emergence at 28 days after planting; <sup>3/</sup> Winter survival—Plant survival rating of Excellent >75%, Good 50-75%, Marginal 25-50%, Poor <25%; <sup>4/</sup> Maturity date—Days after planting to 50% bloom: <165=Early, 165-190=Mid, >190=Late; and <sup>5/</sup> Disease and insect ranking—Damage observed was None, Low, Moderate, or High.						

## References

- Clark, A., editor. 2012. Managing cover crops profitably, 3rd Edition. Sustainable Agriculture Research and Education. Handbook Series Book 9.
- USDA, NRCS. 2019. The PLANTS Database (<http://plants.usda.gov>, 30 September 2019). National Plant Data Team, Greensboro, NC 27401-4901 USA.

## For More Information

Analysis of the data used for compiling the tables in this regional report can be found at:  
[https://www.nrcs.usda.gov/Internet/FSE\\_PLANTMATERIALS/publications/natpmtnccatsupp.pdf](https://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/natpmtnccatsupp.pdf)

Final study reports with more details on the performance of the cover crop varieties at each PMC location can be found at:

Booneville, Arkansas

[https://www.nrcs.usda.gov/Internet/FSE\\_PLANTMATERIALS/publications/arpmcscr13516.pdf](https://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/arpmcscr13516.pdf)

Knox City, Texas

[https://www.nrcs.usda.gov/Internet/FSE\\_PLANTMATERIALS/publications/txpmcscr13511.pdf](https://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/txpmcscr13511.pdf)

Nacogdoches, Texas

[https://www.nrcs.usda.gov/Internet/FSE\\_PLANTMATERIALS/publications/etpmcscr13549.pdf](https://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/etpmcscr13549.pdf)