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COVER CROP VARIETY TESTS IN TENNESSEE

2022

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Cover Crop Variety Tests in Tennessee

2022

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Experimental Procedures

Cover crop variety tests were conducted at the East Tennessee (Knoxville; ETREC) and Middle Tennessee (Spring Hill; MTREC) AgResearch and Education Centers (REC). All locations were planted with a drill to a length of 15 ft. Plot widths varied slightly by location based on equipment. Plots were planted at the East Tennessee AgResearch and Education Center in 16 rows on 7.5 in. spacing and at the Middle Tennessee AgResearch and Education Center in 14 rows on 7 in. spacing. Plots were planted in a randomized complete block design and replicated three times at each location. Varieties were planted at the appropriate seeding depth for each species (Table 1). The trial included varieties within the broader groups of brassicas, cereals and legumes; however, all varieties were evaluated in a single trial in order to provide a better head-to-head comparison of the many cover crop varieties available. Contact information and websites for seed suppliers are summarized in Table 2.

Trials were conducted under two planting dates to represent environmental conditions typical for planting cover crops following corn (early Oct.) and soybeans/cotton (early Nov.) in Tennessee. Entrants were allowed to participate in one or both planting dates.

Assessment of Canopy Cover

Canopy cover was assessed in the Fall (late Nov./early Dec.) and Winter (early Feb.) using digital image analysis. Two 21 in. x 21 in. PVC squares were randomly placed in each plot and photographed. These photographs were then analyzed for percent green cover using APS Assess software (APS Press, St. Paul, Minnesota). The height of many of the cereal and brassica species made this method ineffective for assessing cover in the spring. Because of this, percent canopy cover was rated visually in early Apr. and early May.

Assessment of Height

Height of cover crop varieties was measured in Nov./Dec., Feb., April, and May for species taller than 4 in. Species shorter than 4 in. were not measured but recorded as 1 in. for statistical purposes.

Assessment of Biomass

Cover crop biomass was measured for two, randomly selected, 21 in. x 21 in. square areas within each plot. Biomass within each square was cut to a height of 1 in. above the soil surface using handheld electronic clippers. Biomass was dried to a constant weight and dry matter biomass was calculated on a tons per acre basis.

Assessment of Forage Quality

One sample from each plot was dried and ground using a Wiley Mill (Thomas Scientific, Swedesboro, New Jersey) to pass a 2-mm screen; then, finished by passing through a Cylcotec (Foss North America, Eden Prairie, Minnesota) with a 1-mm screen. Samples were dried to a

consistent moisture level and scanned on a Foss DS2500F Near infrared Spectrometer (Foss North American, Eden Prairie, Minnesota). Calibrations used were from the NIRS Consortium (Berea, Kentucky). All forage quality data reported at 100 percent dry matter.

Assessment of Nitrogen Content and Nitrogen Release

NIRS estimated CP, ADF, NDF, lignin and ash were used to derive the following values, according to Woodruff et al. (2008): percent nitrogen (CP/6.25), carbohydrates (NFC + CP + fat), cellulose (ADF – (Lignin + Ash)), and hemicellulose (NDF - ADF). Mean values for lignin, carbohydrates, and cellulose + hemicellulose were normalized to 100 percent and inputted into the University of Georgia (UGA) cover crop nitrogen calculator (aesl.ces.uga.edu/mineralization, Gaskin, 2016), along with mean percent nitrogen and biomass, to estimate nitrogen release. The UGA cover crop nitrogen calculator incorporates weather data into the prediction model; however, the calculator does not currently include any Tennessee locations. Therefore, the Walker County, Georgia, location (bordering Hamilton County, Tennessee) was selected as the most representative of the trial locations. For background options, "no" for high organic matter soil, and "left on surface" for cover crop residue were selected.

Interpretation of Data

The tables on the following pages have been prepared with the entries sorted by group (brassica, cereal, legume), common name and variety. Biomass, cover, height data, total nitrogen, NIRS quality constituents and estimated nitrogen were analyzed using the MIXED procedure in SAS v. 9.4 (Cary, North Carolina) with mean separation performed using the Fisher's Protected LSD (Least Significant Difference) test. All analyses used a mixed model with variety and location as fixed effects and block as a random effect with an alpha level of 0.05 to determine significance. The models for cover and biomass also included sample as a random effect. Mean separation letters have been listed next to mean values for each trait. Across all entries, varieties that have any letter in common within a column are not significantly different at the 5 percent level of probability. Varieties with performance statistically equivalent to the highest value for each respective trait will have an "A" included in the list of mean separation letters next to that entry. Mean separation letters of "A-group" varieties are highlighted in dark orange. Additionally, mean values between the 50th and 75th percentile are highlighted in light orange and above the 75th percentile are highlighted in dark orange.

Results

Thirteen varieties (one brassica, three cereals, nine legumes) and eight cereal/legume mixes were included in both the Oct. and Nov. planted trial (Table 1). Mixes are listed by the cereal and legume components at their respective seeding rates compared to a monoculture. For example, Bates RS4 (20%) + Dixie (80%) indicates a mix in which Bates RS4 was planted at 20 percent of the monoculture rate for cereal rye and Dixie was planted at 80 percent of the monoculture rate for crimson clover.

Variety performance is given across locations (Oct. planted — Tables 4 to 7; Nov. planted — Tables 16 to 19) and for each individual location, Knoxville (East Tennessee AgResearch and Education Center; Oct. planted — Tables 8 to 11; Nov planted — Tables 20 to 23) and Spring

Hill (Middle Tennessee AgResearch and Education Center; Oct. planted — Tables 12 to 15; Nov. planted — Tables 24 to 27) Results are also presented for each evaluated trait in a side-by-side comparison of locations, which is available as a downloadable Excel table on search.utcrops.com (Appendix A, Appendix B).

Varieties differed significantly among all evaluated traits. Within both planting dates, most traits exhibited a significant interaction between variety and location, indicating variety differences differed by location. However, top performers tended to be consistent across locations.

References

Gaskin, J., M. Cabrera, D. Kissel. 2016. Predicting nitrogen release from cover crops: The cover crop nitrogen availability calculator. UGA Extension Bulletin 1466.

Woodruff, L.K., R. Hitchcock, L. Sonon, U. Saha, D.E. Kissel, J. Gaskin, N. Romano, M.L. Cabrera, M.Y. Habteselassie, M. Vigil, J. Rema. 2018. A web-based model of N mineralization from cover crop residue decomposition. Soil Sci. Soc. Am. J. 82:983-993. doi: 10.2136/ssaj2017.05.0144.

Table 1. Characteristics of cover crop varieties evaluated during 2022-2022.

Group	Common Name	Variety/Hybrid	Company	Seeding Depth (in)	Seeding Rate (lb/ac)	Early Planted Trial	Late Planted Trial
Brassica	Radish	Driller	GrasslandOregon	0.25 - 0.5	10	1	1
Cereal	Cereal Rye	Yankee	Green Cover Seed	1 - 2	150	1	1
Cereal	Cereal Rye	Bates RS4	Noble Foundation	1 - 2	150	1	1
Cereal	Wheat	TN1902	Univ. of TN	1 - 2	150	1	1
Legume	Clover, Balansa	FIXatioN	GrasslandOregon	0.25 - 0.5	5	1	1
Legume	Clover, Berseem	Balady	Smith Seed Services	0.25 - 0.5	12	1	1
Legume	Clover, Berseem	Frosty	GrasslandOregon	0.25 - 0.5	12	1	1
Legume	Clover, Crimson	Dixie	Smith Seed Services	0.25 - 0.5	25	1	1
Legume	Clover, Crimson	Kentucky Pride	GrasslandOregon	0.25 - 0.5	25	1	1
Legume	Clover, Persian	eNhance	GrasslandOregon	0.25 - 0.5	5	1	1
Legume	Clover, Red	Dynamite	GrasslandOregon	0.25 - 0.5	10	1	1
Legume	Clover, Red	Q	GrasslandOregon	0.25 - 0.5	10	1	1
Legume	Vetch, Hairy	AU Merit	Smith Seed Services	1 - 2	30	1	1
Mix	Cereal Rye + Hairy Vetch	1. Bates RS4 (10%) + AU Merit (90%)	Mix	1 - 2	15 + 27	1	1
Mix	Cereal Rye + Hairy Vetch	2. Bates RS4 (20%) + AU Merit (80%)	Mix	1 - 2	30 + 24	1	1
Mix	Cereal Rye + Hairy Vetch	3. Yankee (20%) + AU Merit (80%)	Mix	1 - 2	30 + 24	1	1
Mix	Wheat + Hairy Vetch	4. TN1902 (20%) + AU Merit (80%)	Mix	1 - 2	30 + 24	1	1
Mix	Cereal Rye + Crimson Clover	5. Bates RS4 (10%) + Dixie (90%)	Mix	0.25 - 0.5	15 + 23	1	1
Mix	Cereal Rye + Crimson Clover	6. Bates RS4 (20%) + Dixie (80%)	Mix	0.25 - 0.5	30 + 20	1	1
Mix	Cereal Rye + Crimson Clover	7. Yankee (20%) + Dixie (80%)	Mix	0.25 - 0.5	30 + 20	1	1
Mix	Wheat + Crimson Clover	8. TN1902 (20%) + Dixie (80%)	Mix	0.25 - 0.5	30 + 20	1	1

Table 2. Contact information for cover crop seed companies submitting varieties evaluated in tests in Tennessee during 2021 - 2022.

Company	Contact	Phone	Email	Web site
GO Seed	Jerry Hall	503-566-9900	jhall@goseed.com	www.goseed.com
Noble Research Institute	unavailable			
Smith Seed Services	Jonathan Rupert	888-550-2930	jrupert@smithseed.com	www.smithseed.com
University of Tennessee	Dennis West	865-974-882	dwest3@utk.edu	

Table 3. Location information from University of Tennessee AgResearch and Education Centers where crop variety trials were conducted during 2021 - 2022.

Location	AgResearch and Education Center	Early Planting	Late Planting	Fall Eval.	Winter Eval.	Spring Eval. 1	Spring Eval. 2	Soil Type
Knoxville	East Tennessee	1-Oct-2021	1-Nov-2021	29-Nov-2021	2-Feb-2022	4-Apr-2022	2-May-2022	Shady Loam
Spring Hill	Middle Tennessee	30-Sep-2021	1-Nov-2021	30-Nov-2021	3-Feb-2022	1-Apr-2022	29-Apr-2022	Maury Silt Loam

Table 4. Across location mean biomass and weed suppression of 16 cover crop varieties and 8 mixes planted in early Oct. 2021, in small plot replicated trials, at two University of Tennessee AgResearch and Education Center locations, in Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	Cover Crop Biomass (DM lb/ac)		Weed Biomass (DM lb/ac)	
		Apr	May	Apr	May
Driller	Radish	3 H	21 K	165 EFG	423 EFGH
Bates RS4	Cereal Rye	2216 BC	3640 EFG	97 EFG	222 HI
Yankee	Cereal Rye	956 EF	2613 GHI	0 G	110 I
TN1902	Wheat	692 FG	2537 HI	86 EFG	217 HI
FIXatioN	Clover, Balansa	165 GH	1597 IJ	510 BCD	742 BCD
Balady	Clover, Berseem	57 H	0 K	109 EFG	0 I
Frosty	Clover, Berseem	217 GH	1286 J	734 AB	875 ABC
Dixie	Clover, Crimson	1484 DE	4113 DEF	329 CDE	551 DEF
Kentucky Pride	Clover, Crimson	1064 EF	3533 FGH	486 BCD	517 DEFG
eNhance	Clover, Persian	204 GH	86 K	269 DEF	593 CDE
Dynamite	Clover, Red	214 GH	1325 J	839 A	946 AB
Q	Clover, Red	125 H	656 JK	533 BC	1066 A
AU Merit	Vetch, Hairy	1808 CD	4019 DEF	193 EFG	21 I
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	2488 AB	5590 B	68 EFG	78 I
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	2634 AB	6700 A	65 FG	188 HI
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	1691 CD	4704 BCDE	144 EFG	60 I
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	1824 CD	4482 CDEF	115 EFG	23 I
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	2859 A	5009 BCD	152 EFG	199 HI
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	2200 BC	5543 BC	44 FG	251 GHI
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	2185 BC	5642 AB	118 EFG	287 FGHI
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	1777 CD	4146 DEF	293 CDEF	416 EFGH
Summary Statistics					
Average		1279	3202	255	371
Standard Error		199	391	94	107
Min		3	0	0	0
Max		2859	6700	839	1066
Range		2856	6700	839	1066
ANOVA p-values					
- Variety		**<0.001**	**<0.001**	**<0.001**	**<0.001**
- Location		**<0.001**	**0.013**	**<0.001**	**<0.001**
- Variety x Location		**0.009**	**0.037**	**<0.001**	**<0.001**

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, $P<0.05$). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

Table 5. Across location mean cover and height of 16 cover crop varieties and 8 mixes planted in early Oct. 2021, in small plot replicated trials, at two University of Tennessee AgResearch and Education Center locations, in Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	Cover Crop Canopy Cover (%)				Height (in)			
		Dec	Feb	Apr	May	Dec	Feb	Apr	May
Driller	Radish	66 ABC	20 DE	2 IJ	1 H	7 FGH	2 JK	4 HIJ	8 JK
Bates RS4	Cereal Rye	77 A	56 BC	40 E	43 DEF	10 A	11 A	28 B	60 AB
Yankee	Cereal Rye	76 A	51 C	38 EF	43 DEF	8 DEFG	5 GH	12 DE	44 DE
TN1902	Wheat	66 ABC	53 C	23 FGH	22 G	7 GH	6 FG	12 DE	25 G
FIXatioN	Clover, Balansa	3 HI	8 EF	34 EFG	39 EFG	2 L	1 KL	5 GHI	23 G
Balady	Clover, Berseem	0 I	6 F	0 J	0 H	4 I	0 L	1 J	3 K
Frosty	Clover, Berseem	22 FG	19 DE	20 GH	68 C	4 IJK	3 JK	7 FGHI	16 I
Dixie	Clover, Crimson	56 CD	50 C	66 CD	56 CDE	4 IJK	4 IJ	10 EF	25 G
Kentucky Pride	Clover, Crimson	69 ABC	53 C	58 D	70 C	4 IJ	4 HI	8 FG	21 GHI
eNhance	Clover, Persian	15 GH	11 EF	2 IJ	3 H	3 KL	1 L	4 IJ	10 J
Dynamite	Clover, Red	47 DE	26 D	34 EFG	60 CD	4 IJ	2 K	7 FGH	21 GH
Q	Clover, Red	36 EF	11 EF	17 HI	33 FG	3 JKL	1 KL	7 FGHI	18 HI
AU Merit	Vetch, Hairy	50 DE	61 ABC	87 A	93 A	6 H	6 FG	15 CD	26 G
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	74 AB	72 A	86 AB	96 A	10 AB	9 BC	28 B	53 C
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	72 AB	67 AB	82 AB	93 A	9 BCDE	10 AB	32 A	55 BC
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	61 BCD	69 AB	71 ABCD	92 A	8 CDEF	6 FG	16 C	41 E
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	67 ABC	69 A	77 ABC	91 AB	7 EFG	8 DE	16 C	32 F
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	74 AB	73 A	71 ABCD	67 C	9 BCD	8 CD	30 AB	62 A
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	73 AB	67 AB	66 CD	73 BC	9 ABC	10 A	30 AB	62 A
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	73 AB	66 AB	74 ABC	59 CD	7 EFG	6 FG	16 C	47 D
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	70 ABC	70 A	70 BCD	68 C	7 FGH	7 EF	15 CD	31 F
Summary Statistics									
Average		55	46	49	56	6	5	14	32
Standard Error		5	5	6	7	1	1	1	2
Min		0	6	0	0	2	0	1	3
Max		77	73	87	96	10	11	32	62
Range		77	67	87	96	8	10	31	60
ANOVA p-values									
- Variety		**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**
- Location		**N.S.**	**0.028**	**<0.001**	**0.024**	**<0.001**	**0.004**	**0.003**	**N.S.**
- Variety x Location		**<0.001**	**N.S.**	**N.S.**	**0.014**	**0.001**	**N.S.**	**0.003**	**<0.001**

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

Table 6. Across location mean nitrogen content and estimated nitrogen release of 16 cover crop varieties and 8 mixes planted in early Oct. 2021, in small plot replicated trials, at two University of Tennessee AgResearch and Education Center locations, in Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	Total Nitrogen¶ (%)		Estimated N Released†† Apr. Term. (lbs/ac)			Estimated N Released†† MayTerm. (lbs/ac)		
		Apr	May	2 wks	4 wks	12 wks	2 wks	4 wks	12 wks
Driller	Radish								
Bates RS4	Cereal Rye	1.6 J	0.9 E	3 FG	6 E	10 E	-1 J	-1 I	-3 I
Yankee	Cereal Rye	2.1 I	1.2 DE	4 FG	7 E	10 E	1 J	2 I	4 I
TN1902	Wheat	2.3 HI	1.3 D	8 EF	12 DE	17 DE	2 IJ	5 HI	9 HI
FIXatioN	Clover, Balansa	3.7 BC	3.2 A	2 FG	4 E	6 E	17 FG	26 EF	34 EF
Balady	Clover, Berseem								
Frosty	Clover, Berseem	3.7 BC	3.2 A	4 FG	7 E	10 E	13 GH	19 FGH	25 FGH
Dixie	Clover, Crimson	3.6 BC	2.5 B	14 BCD	24 ABC	37 ABC	26 CDE	41 CD	57 BCD
Kentucky Pride	Clover, Crimson	3.7 BC	2.7 B	10 DE	17 CD	28 CD	26 DEF	40 CDE	55 CD
eNhance	Clover, Persian								
Dynamite	Clover, Red	3.7 BC	3.3 A	4 FG	6 E	10 E	12 GH	19 FGH	26 FGH
Q	Clover, Red	3.8 B	3.3 A	1 G	2 E	3 E	6 HIJ	9 GHI	12 GHI
AU Merit	Vetch, Hairy	4.2 A	3.4 A	20 A	32 A	49 A	38 AB	57 AB	75 AB
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	3.3 DE	3.3 A	19 AB	31 A	48 A	44 A	67 A	89 A
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	2.8 FG	2.5 B	15 ABCD	25 ABC	39 ABC	33 BCD	51 BC	69 BC
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	3.5 CD	3.1 A	14 BCD	24 ABC	36 ABC	35 ABC	53 ABC	71 ABC
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	3.4 CD	3.2 A	15 ABCD	26 ABC	39 ABC	32 BCD	49 BC	66 BC
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	2.5 GH	1.8 C	14 BCD	23 ABC	37 ABC	14 GH	22 FG	31 EF
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	2.6 GH	1.7 C	12 CDE	20 BCD	31 BCD	11 GHI	19 FGH	29 EFG
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	3.1 EF	2.0 C	17 ABC	28 AB	42 AB	21 EFG	33 DEF	46 DE
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	2.9 F	2.0 C	13 BCD	22 BC		16 G	25 F	34 EF
Summary Statistics									
Average		3.1	2.5	10	17	27	19	30	41
Standard Error		0.1	0.1	2	3	5	3	5	7
Min		1.6	0.9	1	2	3	-1	-1	-3
Max		4.2	3.4	20	32	49	44	67	89
Range		2.6	2.5	18	30	46	45	69	92
ANOVA p-values									
- Variety		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
- Location		0.002	<0.001	<0.001	<0.001	<0.001	0.044	N.S.	N.S.
- Variety x Location		<0.001	0.007	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

¶ Analyzed using near infrared spectroscopy (NIRS) with the appropraite calibration for each species. Reported on a 100% DM basis.

†† Estimated using quality constituents from NIRS inputted into the UGA cover crop nitrogen calculator.

Table 7-a. Across location mean forage quality of 16 cover crop varieties and 8 mixes planted in early Oct. 2021, in small plot replicated trials, at two University of Tennessee AgResearch and Education Center locations, in Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	CP¶		ADF¶		NDF¶	
		Apr	May	Apr	May	Apr	May
Driller	Radish						
Bates RS4	Cereal Rye	10.1 J	5.6 E	28.6 A	42.6 A	58.2 A	74.6 A
Yankee	Cereal Rye	13.2 I	7.5 DE	19.8 EF	35.1 C	44.1 B	66.6 B
TN1902	Wheat	14.2 HI	8.2 D	20.9 E	27.5 E	42.0 BC	53.5 DE
FIXatioN	Clover, Balansa	23.2 BC	19.7 A	15.6 G	24.6 F	18.2 H	28.7 L
Balady	Clover, Berseem						
Frosty	Clover, Berseem	23.3 BC	19.9 A	20.5 EF	29.6 E	25.6 G	34.6 K
Dixie	Clover, Crimson	22.8 BC	15.8 B	20.2 EF	34.2 CD	25.2 G	40.5 IJ
Kentucky Pride	Clover, Crimson	23.1 BC	17.0 B	18.7 F	32.1 D	23.3 G	38.4 JK
eNhance	Clover, Persian						
Dynamite	Clover, Red	23.3 BC	20.4 A	20.3 EF	28.5 E	25.7 G	34.9 K
Q	Clover, Red	23.9 B	20.5 A	21.7 DE	28.5 E	26.6 FG	34.4 K
AU Merit	Vetch, Hairy	26.4 A	21.1 A	23.6 BC	36.6 BC	29.7 EF	43.3 HI
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	20.4 DE	20.5 A	27.8 A	36.2 BC	39.9 C	46.8 GH
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	17.4 FG	15.9 B	29.5 A	40.3 A	45.3 B	54.6 CDE
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	21.7 CD	19.3 A	24.6 BC	36.1 BC	34.7 D	47.5 FGH
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	21.3 CD	20.0 A	25.2 B	34.7 C	35.9 D	45.4 GH
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	15.8 GH	11.4 C	29.1 A	40.7 A	44.8 B	56.1 CD
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	16.0 GH	10.8 C	28.5 A	41.0 A	45.0 B	58.2 C
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	19.2 EF	12.5 C	22.9 CD	37.6 B	32.5 DE	51.4 EF
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	18.3 F	12.3 C	23.1 CD	35.3 BC	33.2 D	48.2 FG
Summary Statistics							
Average		19.6	15.5	23.4	34.5	35.0	47.7
Standard Error		0.7	0.8	0.7	1.3	1.3	1.6
Min		10.1	5.6	15.6	24.6	18.2	28.7
Max		26.4	21.1	29.5	42.6	58.2	74.6
Range		16.3	15.5	14.0	18.0	39.9	45.9
ANOVA p-values							
- Variety		**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**
- Location		**0.002**	**<0.001**	**N.S.**	**0.008**	**<0.001**	**0.040**
- Variety x Location		**<0.001**	**0.007**	**<0.001**	**<0.001**	**<0.001**	**<0.001**

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

¶ Analyzed using near infrared spectroscopy (NIRS) with the appropraite calibration for each species. Reported on a 100% DM basis.

Table 7-b. Across location mean forage quality of 16 cover crop varieties and 8 mixes planted in early Oct. 2021, in small plot replicated trials, at two University of Tennessee AgResearch and Education Center locations, in Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	Ash¶		Fat¶		Lignin¶	
		Apr	May	Apr	May	Apr†	May
Driller	Radish						
Bates RS4	Cereal Rye	2.5 J	1.4 I	2.2 EF	1.6 FG	3.3 F	6.5 BCD
Yankee	Cereal Rye	2.4 J	1.8 I	3.3 A	2.3 A	2.3 G	4.2 I
TN1902	Wheat	3.9 I	1.0 I	2.9 B	2.1 CD	2.0 G	3.1 J
FIXatioN	Clover, Balansa	9.4 A	8.9 A	2.3 E	2.0 D	3.2 F	4.5 I
Balady	Clover, Berseem						
Frosty	Clover, Berseem	6.7 BC	8.8 AB	2.3 DE	2.1 BCD	3.9 E	5.4 FGH
Dixie	Clover, Crimson	7.6 B	5.8 EF	2.3 DE	1.6 EF	4.2 BCDE	7.0 AB
Kentucky Pride	Clover, Crimson	7.1 BC	6.5 DE	2.3 DE	1.8 E	4.0 BCDE	6.3 CDE
eNhance	Clover, Persian						
Dynamite	Clover, Red	6.5 C	7.3 CD	2.3 DE	2.1 BCD	3.9 DE	5.1 H
Q	Clover, Red	6.3 CDE	7.8 BC	2.3 E	2.1 CD	4.4 BC	5.4 GH
AU Merit	Vetch, Hairy	6.4 CD	6.0 EF	2.6 C	2.1 CD	5.0 A	7.4 A
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	5.2 FG	6.1 E	2.3 DE	2.2 ABC	4.4 BCD	6.0 DEF
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	4.8 FGHI	6.2 E	2.3 DE	1.8 E	4.3 BCDE	6.7 BC
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	5.6 DEF	6.2 E	2.6 C	2.3 AB	4.5 B	5.9 EFG
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	5.2 F	5.7 EF	2.4 CD	2.1 CD	4.3 BCDE	5.8 EFG
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	4.3 GHI	4.0 GH	2.1 F	1.5 FG	4.3 BCDE	6.8 ABC
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	4.2 HI	4.3 GH	2.2 EF	1.4 G	4.0 CDE	6.8 ABC
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	4.9 FGH	5.0 FG	2.5 C	1.8 E	4.2 BCDE	6.3 CDE
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	5.4 EF	3.5 H	2.3 DE	1.7 EF	4.3 BCDE	6.3 CDE
Summary Statistics							
Average		5.5	5.3	2.4	1.9	3.9	5.9
Standard Error		0.3	0.4	0.1	0.1	0.2	0.2
Min		2.4	1.0	2.1	1.4	2.0	3.1
Max		9.4	8.9	3.3	2.3	5.0	7.4
Range		7.0	7.9	1.2	0.9	3.0	4.3
ANOVA p-values							
- Variety		**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**
- Location		**<0.001**	**<0.001**	**N.S.**	**<0.001**	**<0.001**	**<0.001**
- Variety x Location		**0.003**	**0.038**	**0.004**	**<0.001**	**<0.001**	**N.S.**

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

¶ Analyzed using near infrared spectroscopy (NIRS) with the appropraite calibration for each species. Reported on a 100% DM basis.

Table 8. By location mean biomass and weed suppression of 16 cover crop varieties and 8 mixes planted in early Oct. 2021, in small plot replicated trials, at the East Tennessee AgResearch and Education Center, in Knoxville, Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	Cover Crop Biomass (DM lb/ac)		Weed Biomass (DM lb/ac)	
		Apr	May	Apr	May
Driller	Radish	5 I	31 I	329 CDEF	815 DEF
Bates RS4	Cereal Rye	1787 CDE	2409 EFG	193 DEF	444 FGH
Yankee	Cereal Rye	1050 EFG	2942 DEF	0 F	220 GHI
TN1902	Wheat	904 FGH	1808 FGH	99 F	402 GHI
FIXatioN	Clover, Balansa	162 HI	1463 FGHI	789 B	1380 BC
Balady	Clover, Berseem	115 I	0 I	130 DEF	0 I
Frosty	Clover, Berseem	371 GHI	1165 GHI	1270 A	1474 ABC
Dixie	Clover, Crimson	2138 BCD	4552 BC	564 BC	1087 CD
Kentucky Pride	Clover, Crimson	1594 DEF	3559 CDE	826 B	909 DE
eNhance	Clover, Persian	408 GHI	172 I	491 BCDE	1186 CD
Dynamite	Clover, Red	308 GHI	1223 GHI	1385 A	1756 AB
Q	Clover, Red	225 HI	742 HI	758 B	1876 A
AU Merit	Vetch, Hairy	2258 ABCD	4312 BCD	314 CDEF	42 HI
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	2969 A	5017 ABC	89 F	157 GHI
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	2775 AB	6235 A	131 EF	376 GHI
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	2404 ABC	4981 ABC	267 CDEF	120 GHI
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	2169 BCD	4249 BCD	199 CDEF	46 HI
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	2477 ABC	3915 CDE	282 CDEF	382 GHI
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	2456 ABC	4186 BCD	84 F	502 EFG
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	2315 ABCD	5529 AB	209 CDEF	502 EFG
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	2164 BCD	4247 BCD	549 BCD	833 DEF
Summary Statistics					
Average		1479	2988	427	691
Standard Error		280	551	134	149
Min		5	0	0	0
Max		2969	6235	1385	1876
Range		2963	6235	1385	1876
ANOVA p-values					
- Variety		<0.001	<0.001	<0.001	<0.001
- Location					
- Variety x Location					

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, *P* <0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

Table 9. By location mean cover and height of 16 cover crop varieties and 8 mixes planted in early Oct. 2021, in small plot replicated trials, at the East Tennessee AgResearch and Education Center, in Knoxville, Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	Cover Crop Canopy Cover (%)				Height (in)			
		Dec	Feb	Apr	May	Dec	Feb	Apr	May
Driller	Radish	49 DE	31 FGH	3 C	2 I	6 FGH	3 IJK	8 FGH	15 J
Bates RS4	Cereal Rye	82 A	55 CDE	34 B	34 GH	10 A	12 A	26 A	57 AB
Yankee	Cereal Rye	71 ABC	44 DEF	37 B	34 GH	7 DEFG	5 HI	13 CDE	47 CD
TN1902	Wheat	77 AB	59 BCD	22 BC	13 HI	7 EFGH	6 GH	12 DEF	21 GHIJ
FIXatioN	Clover, Balansa	5 H	3 J	40 B	58 DEFG	2 K	2 JKL	6 H	25 EFGH
Balady	Clover, Berseem	0 H	2 J	0 C	0 I	5 GHI	0 M	0 I	5 K
Frosty	Clover, Berseem	30 EFG	25 GHI	29 B	66 BCDE	5 HI	3 IJK	8 GH	19 HIJ
Dixie	Clover, Crimson	49 DE	47 DEF	75 A	35 GH	5 HI	3 JK	12 DEFG	24 EFGH
Kentucky Pride	Clover, Crimson	55 CD	47 DEF	69 A	55 DEFG	5 HI	5 HI	10 EFGH	21 GHIJ
eNhance	Clover, Persian	14 GH	14 HIJ	3 C	5 I	4 IJ	1 LM	6 H	15 IJ
Dynamite	Clover, Red	48 DEF	39 EFG	43 B	38 FGH	5 HI	4 IJ	9 EFGH	22 FGHI
Q	Clover, Red	28 FG	9 IJ	28 B	42 EFG	3 JK	2 KLM	7 H	20 GHIJ
AU Merit	Vetch, Hairy	57 CD	66 ABC	88 A	88 ABC	8 CDE	7 EFGH	18 BC	26 EFG
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	78 AB	80 A	90 A	93 A	10 AB	9 CD	27 A	43 D
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	61 BCD	71 ABC	90 A	92 A	9 ABCD	10 BC	30 A	45 CD
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	78 AB	77 AB	84 A	93 A	10 A	7 DEFG	18 B	43 D
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	73 ABC	73 ABC	81 A	91 AB	8 BCDE	8 CDE	18 B	30 E
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	63 ABCD	72 ABC	82 A	65 BCDE	9 ABC	8 CDEF	27 A	57 A
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	63 ABCD	69 ABC	75 A	69 ABCD	10 AB	11 AB	29 A	60 A
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	72 ABC	67 ABC	75 A	62 CDEF	7 CDEF	6 FGH	18 BC	50 BC
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	71 ABC	74 ABC	72 A	66 BCDE	7 CDEF	7 DEFG	15 BCD	28 EF
Summary Statistics									
Average		54	49	53	52	7	6	15	32
Standard Error		7	7	8	9	1	1	2	2
Min		0	2	0	0	2	0	0	5
Max		82	80	90	93	10	12	30	60
Range		82	78	90	93	8	12	30	55
ANOVA p-values									
- Variety		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
- Location									
- Variety x Location									

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

Table 10. By location mean nitrogen content and estimated nitrogen release of 16 cover crop varieties and 8 mixes planted in early Oct. 2021, in small plot replicated trials, at the East Tennessee AgResearch and Education Center, in Knoxville, Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	Total Nitrogen¶ (%)		Estimated N Released†† Apr. Term. (lbs/ac)			Estimated N Released†† MayTerm. (lbs/ac)		
		Apr	May	2 wks	4 wks	12 wks	2 wks	4 wks	12 wks
Driller	Radish								
Bates RS4	Cereal Rye	1.7 F	1.1 G	3 F	6 G	9 EF	0 I	0 J	1 L
Yankee	Cereal Rye	2.1 F	1.1 G	4 F	7 FG	11 EF	0 I	2 J	4 KL
TN1902	Wheat	2.1 F	1.3 G	13 DE	20 DEF	28 DE	2 I	4 IJ	6 KL
FIXatioN	Clover, Balansa	3.9 AB	3.1 BC	2 F	3 G	5 F	15 FGH	23 FGHI	30 GHIJK
Balady	Clover, Berseem								
Frosty	Clover, Berseem	3.6 BC	3.2 ABC	8 EF	12 EFG	19 EF	12 FGHI	18 GHIJ	24 HIJKL
Dixie	Clover, Crimson	3.5 BCD	2.5 DE	19 ABCD	33 ABCD	51 ABC	29 BCDE	44 BCDE	61 BCDE
Kentucky Pride	Clover, Crimson	3.5 BCD	2.5 DE	14 CDE	25 CDE	40 CD	23 DEFG	35 DEFG	49 DEFG
eNhance	Clover, Persian								
Dynamite	Clover, Red	3.4 CDE	3.2 ABC	6 EF	10 FG	17 EF	10 GHI	16 GHIJ	21 IJKL
Q	Clover, Red	3.7 BC	3.3 ABC	2 F	3 G	6 F	6 HI	9 HIJ	13 JKL
AU Merit	Vetch, Hairy	4.2 A	3.6 A	25 AB	41 AB	62 AB	39 AB	59 AB	78 ABC
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	3.7 BC	3.6 AB	27 A	45 A	68 A	47 A	70 A	92 A
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	3.4 CDE	2.9 CD	21 ABC	35 ABC	53 ABC	41 AB	61 AB	81 AB
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	3.4 CDE	3.2 ABC	20 ABCD	33 ABC	51 ABC	37 ABC	55 ABC	74 ABCD
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	3.7 BC	3.7 A	20 ABCD	33 ABC	50 ABC	32 BCD	48 BCD	64 BCDE
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	3.1 DE	2.2 EF	19 ABCD	31 BCD	47 BCD	22 DEFG	33 DEFG	44 EFGH
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	3.0 E	2.0 F	17 BCD	28 BCD	43 BCD	16 EFGH	25 EFGH	35 FGHIJ
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	3.1 DE	2.1 EF	19 ABCD	31 BCD	46 BCD	25 CDEF	39 CDEF	53 CDEF
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	3.1 DE	2.1 EF	18 BCD	29 BCD	44 BCD	19 EFGH	29 DEFG	39 EFGH
Summary Statistics									
Average		3.2	2.6	14	24	36	21	32	43
Standard Error		0.2	0.2	3	5	7	5	7	9
Min		1.7	1.1	2	3	5	0	0	1
Max		4.2	3.7	27	45	68	47	70	92
Range		2.5	2.6	25	41	62	47	70	91
ANOVA p-values									
- Variety		<0.001	<0.001	0.001	0.001	0.001	<0.001	<0.001	<0.001
- Location									
- Variety x Location									

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

¶ Analyzed using near infrared spectroscopy (NIRS) with the appropraite calibration for each species. Reported on a 100% DM basis.

†† Estimated using quality constituents from NIRS inputted into the UGA cover crop nitrogen calculator.

Table 11-a. By location mean forage quality of 16 cover crop varieties and 8 mixes planted in early Oct. 2021, in small plot replicated trials, at the East Tennessee AgResearch and Education Center, in Knoxville, Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	CP¶		ADF¶		NDF¶	
		Apr	May	Apr	May	Apr	May
Driller	Radish						
Bates RS4	Cereal Rye	10.6 F	6.7 G	28.0 A	42.2 A	57.5 A	73.0 A
Yankee	Cereal Rye	12.9 F	7.0 G	20.4 E	37.0 BCD	44.6 B	68.2 A
TN1902	Wheat	13.2 F	8.1 G	20.7 DE	27.1 FG	40.7 BC	52.4 B
FIXatioN	Clover, Balansa	24.5 AB	19.4 BC	14.4 F	26.0 G	16.8 J	29.7 G
Balady	Clover, Berseem						
Frosty	Clover, Berseem	22.5 BC	20.3 ABC	21.7 DE	31.2 E	26.1 I	35.8 EFG
Dixie	Clover, Crimson	21.9 BCD	15.8 DE	21.4 DE	35.8 CD	26.5 I	41.7 DE
Kentucky Pride	Clover, Crimson	21.7 BCD	15.8 DE	19.9 E	34.7 D	25.7 I	41.3 DEF
eNhance	Clover, Persian						
Dynamite	Clover, Red	21.1 CDE	19.8 ABC	20.9 DE	30.4 EF	28.4 HI	37.5 EF
Q	Clover, Red	23.2 BC	20.5 ABC	22.3 CDE	30.0 EF	27.7 HI	35.4 FG
AU Merit	Vetch, Hairy	26.5 A	22.7 A	23.1 CD	37.4 BCD	29.2 GHI	45.0 CD
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	23.2 BC	22.5 AB	27.3 AB	35.6 D	35.4 DEF	45.0 CD
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	21.0 CDE	18.3 CD	28.2 A	39.9 AB	38.8 CD	51.2 BC
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	21.5 CDE	19.9 ABC	25.8 AB	38.1 BCD	34.9 DEF	49.1 BC
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	23.0 BC	22.9 A	26.0 AB	36.1 CD	33.7 EFG	45.1 CD
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	19.2 DE	14.0 EF	26.3 AB	36.6 BCD	35.3 DEF	46.0 CD
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	18.6 E	12.4 F	26.7 AB	39.1 ABC	37.9 CDE	52.4 B
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	19.5 DE	13.0 EF	24.8 BC	37.4 BCD	32.6 FGH	48.2 BC
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	19.5 DE	13.4 EF	23.1 CD	36.4 CD	29.7 GHI	46.5 BCD
Summary Statistics							
Average		20.2	16.2	23.4	35.1	33.4	46.9
Standard Error		1.0	1.1	0.9	1.2	1.8	2.2
Min		10.6	6.7	14.4	26.0	16.8	29.7
Max		26.5	22.9	28.2	42.2	57.5	73.0
Range		15.9	16.2	13.8	16.3	40.7	43.4
ANOVA p-values							
- Variety		**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**
- Location							
- Variety x Location							

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

¶ Analyzed using near infrared spectroscopy (NIRS) with the appropraite calibration for each species. Reported on a 100% DM basis.

Table 11-b. By location mean forage quality of 16 cover crop varieties and 8 mixes planted in early Oct. 2021, in small plot replicated trials, at at the East Tennessee AgResearch and Education Center, in Knoxville, Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	Ash¶		Fat¶		Lignin¶	
		Apr	May	Apr	May	Apr†	May
Driller	Radish						
Bates RS4	Cereal Rye	3.2 H	2.5 H	2.3 DEF	1.7 EF	3.4 FG	6.7 ABC
Yankee	Cereal Rye	3.0 H	2.2 H	3.2 A	2.3 A	2.2 HI	4.7 E
TN1902	Wheat	3.9 GH	2.0 H	2.9 B	2.2 AB	2.0 I	3.1 F
FIXatioN	Clover, Balansa	9.3 A	8.4 B	2.3 DEF	1.9 DE	2.9 GH	4.6 E
Balady	Clover, Berseem						
Frosty	Clover, Berseem	7.6 BC	10.1 A	2.4 CD	2.0 BCD	4.1 CDE	5.6 D
Dixie	Clover, Crimson	8.4 AB	6.2 DEF	2.2 EF	1.5 GH	4.4 ABCD	7.3 A
Kentucky Pride	Clover, Crimson	6.9 CD	6.6 DE	2.3 DEF	1.6 FG	4.1 DE	7.0 AB
eNhance	Clover, Persian						
Dynamite	Clover, Red	6.9 CD	7.3 BCD	2.3 DEF	2.1 ABCD	3.9 EF	5.3 DE
Q	Clover, Red	6.2 DEF	8.2 BC	2.3 DEF	1.9 CDE	4.3 BCDE	5.5 D
AU Merit	Vetch, Hairy	6.7 CDE	6.5 DEF	2.6 C	1.9 CDE	4.6 ABCD	7.1 AB
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	6.3 CDE	6.8 CD	2.3 DEF	2.1 ABC	4.8 ABC	5.9 CD
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	5.7 DEF	7.5 BCD	2.5 CD	1.7 EF	4.8 ABC	7.0 AB
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	5.5 EF	7.0 BCD	2.4 CD	2.1 ABCD	4.7 ABCD	6.5 BC
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	6.1 DEF	6.2 DEF	2.4 DE	2.0 BCD	5.0 AB	5.9 CD
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	5.5 EF	5.2 FG	2.2 F	1.5 FGH	4.9 AB	6.9 AB
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	5.7 DEF	5.2 EFG	2.2 EF	1.3 H	4.6 ABCD	7.1 AB
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	5.0 FG	6.1 DEF	2.3 DEF	1.6 FGH	4.9 AB	7.0 AB
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	6.5 CDE	4.3 G	2.3 DEF	1.6 FG	5.0 A	6.9 AB
Summary Statistics							
Average		6.0	6.0	2.4	1.8	4.1	6.1
Standard Error		0.5	0.5	0.1	0.1	0.2	0.3
Min		3.0	2.0	2.2	1.3	2.0	3.1
Max		9.3	10.1	3.2	2.3	5.0	7.3
Range		6.2	8.1	1.0	0.9	3.1	4.1
ANOVA p-values							
- Variety		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
- Location							
- Variety x Location							

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

¶ Analyzed using near infrared spectroscopy (NIRS) with the appropraite calibration for each species. Reported on a 100% DM basis.

Table 12. By location mean biomass and weed suppression of 16 cover crop varieties and 8 mixes planted in early Oct. 2021, in small plot replicated trials, at the Middle Tennessee AgResearch and Education Center, in Spring Hill, Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	Cover Crop Biomass (DM lb/ac)		Weed Biomass (DM lb/ac)	
		Apr	May	Apr	May
Driller	Radish	0 H	10 I	0 A	31 A
Bates RS4	Cereal Rye	2645 AB	4871 BCD	0 A	0 A
Yankee	Cereal Rye	862 DEF	2284 FG	0 A	0 A
TN1902	Wheat	481 EFGH	3266 EF	73 A	31 A
FIXatioN	Clover, Balansa	167 FGH	1730 GH	230 A	105 A
Balady	Clover, Berseem	0 H	0 I	89 A	0 A
Frosty	Clover, Berseem	63 GH	1406 GHI	199 A	277 A
Dixie	Clover, Crimson	831 DEFG	3674 DEF	94 A	16 A
Kentucky Pride	Clover, Crimson	533 EFGH	3507 DEF	146 A	125 A
eNhance	Clover, Persian	0 H	0 I	47 A	0 A
Dynamite	Clover, Red	120 FGH	1427 GHI	293 A	136 A
Q	Clover, Red	26 H	570 HI	308 A	256 A
AU Merit	Vetch, Hairy	1359 CD	3726 DEF	73 A	0 A
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	2007 BC	6162 AB	47 A	0 A
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	2493 AB	7165 A	0 A	0 A
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	977 DE	4427 CDE	21 A	0 A
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	1479 CD	4714 BCDE	31 A	0 A
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	3240 A	6104 AB	21 A	16 A
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	1944 BC	6899 A	5 A	0 A
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	2054 BC	5754 ABC	26 A	73 A
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	1390 CD	4045 DE	37 A	0 A
Summary Statistics					
Average		1080	3416	83	51
Standard Error		280	548	132	148
Min		0	0	0	0
Max		3240	7165	308	277
Range		3240	7165	308	277
ANOVA p-values					
- Variety		<0.001	<0.001	0.944	N.S.
- Location					
- Variety x Location					

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, *P* <0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

Table 13. By location mean cover and height of 16 cover crop varieties and 8 mixes planted in early Oct. 2021, in small plot replicated trials, at the Middle Tennessee AgResearch and Education Center, in Spring Hill, Tennessee, and evaluated from Fall 2021 to Spring 2022.

		Cover Crop Canopy Cover (%)				Height (in)			
Variety	Common Name	Dec	Feb	Apr	May	Dec	Feb	Apr	May
Driller	Radish	82 ABC	9 D	1 IJ	1 H	8 ABCD	2 H	0 I	0 I
Bates RS4	Cereal Rye	73 ABCD	56 ABC	46 DEF	52 DEF	10 A	9 A	30 A	62 A
Yankee	Cereal Rye	82 ABC	57 ABC	40 EF	51 EF	8 BCDE	5 CDEF	10 CDE	40 BC
TN1902	Wheat	55 DE	46 C	24 FGHI	30 FG	7 DEF	6 CDE	12 BC	29 DE
FIXatioN	Clover, Balansa	1 F	14 D	28 FG	19 GH	2 I	1 H	5 FGH	21 FG
Balady	Clover, Berseem	0 F	9 D	1 J	0 H	3 HI	1 H	2 GHI	0 I
Frosty	Clover, Berseem	14 F	14 D	10 GHIJ	69 BCDE	2 I	2 GH	6 EFG	14 H
Dixie	Clover, Crimson	63 BCDE	53 BC	57 CDE	77 ABCD	3 HI	4 EF	7 DEF	26 EF
Kentucky Pride	Clover, Crimson	83 AB	59 ABC	46 DEF	86 ABC	3 HI	4 FG	7 DEF	21 FG
eNhance	Clover, Persian	15 F	7 D	2 HIJ	1 H	2 I	1 H	1 HI	5 I
Dynamite	Clover, Red	46 E	12 D	24 FGH	83 ABC	3 HI	1 H	5 FGH	20 FGH
Q	Clover, Red	45 E	13 D	7 GHIJ	24 GH	3 HI	1 H	6 EF	15 GH
AU Merit	Vetch, Hairy	43 E	57 ABC	86 A	99 A	4 GH	5 DEF	11 BCD	25 EF
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	69 ABCD	63 ABC	82 AB	99 A	10 AB	9 A	29 A	63 A
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	83 AB	63 ABC	75 ABC	94 AB	8 ABCD	10 A	34 A	65 A
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	43 E	60 ABC	59 CDE	91 ABC	6 FG	6 CDE	14 BC	38 BC
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	62 CDE	65 ABC	73 ABC	91 ABC	7 DEF	7 BC	14 BC	34 CD
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	85 A	73 A	60 BCDE	68 CDE	8 ABCD	9 AB	33 A	66 A
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	82 ABC	65 ABC	57 CDE	77 ABCD	9 ABC	10 A	31 A	65 A
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	74 ABCD	65 AB	73 ABC	55 DEF	7 CDEF	6 CD	13 BC	44 B
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	68 ABCD	67 AB	68 ABCD	71 BCDE	6 EF	7 CD	15 B	34 CD
Summary Statistics									
Average		56	44	44	59	6	5	14	33
Standard Error		7	7	8	9	1	1	2	2
Min		0	7	1	0	2	1	0	0
Max		85	73	86	99	10	10	34	66
Range		85	66	86	99	8	9	34	66
ANOVA p-values									
- Variety		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
- Location									
- Variety x Location									

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

Table 14. By location mean nitrogen content and estimated nitrogen release of 16 cover crop varieties and 8 mixes planted in early Oct. 2021, in small plot replicated trials, at the Middle Tennessee AgResearch and Education Center, in Spring Hill, Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	Total Nitrogen¶ (%)		Estimated N Released†† Apr. Term. (lbs/ac)			Estimated N Released†† MayTerm. (lbs/ac)		
		Apr	May	2 wks	4 wks	12 wks	2 wks	4 wks	12 wks
Driller	Radish								
Bates RS4	Cereal Rye	1.5 G	0.7 I	3 BCD	6 BCDE	11 BCDE	-2 I	-3 I	-6 H
Yankee	Cereal Rye	2.2 F	1.3 H	3 BCD	6 BCDE	9 BCDE	1 HI	3 HI	5 GH
TN1902	Wheat	2.4 EF	1.3 GH	2 BCD	4 CDEF	6 CDE	3 GHI	6 HI	12 FGH
FIXatioN	Clover, Balansa	3.5 BC	3.2 AB	3 BCD	4 BCDE	7 BCDE	19 CDEF	28 CDEF	37 CDEF
Balady	Clover, Berseem								
Frosty	Clover, Berseem	3.8 AB	3.1 AB	1 D	1 F	2 E	13 DEFG	20 EFGH	27 DEFG
Dixie	Clover, Crimson	3.8 AB	2.5 CD	9 ABCD	14 ABCD	22 ABCD	24 BCDE	38 BCDE	52 BCD
Kentucky Pride	Clover, Crimson	3.9 AB	2.9 ABC	6 BCD	10 BCDE	15 BCDE	28 BC	44 BC	61 ABC
eNhance	Clover, Persian								
Dynamite	Clover, Red	4.1 A	3.3 A	1 CD	2 EF	3 DE	14 DEFG	22 DEFG	30 DEFG
Q	Clover, Red	3.9 AB	3.3 A	0 CD	1 DEF	1 DE	5 GHI	8 GHI	11 GH
AU Merit	Vetch, Hairy	4.2 A	3.1 AB	14 A	23 A	37 A	36 AB	55 AB	73 AB
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	2.8 DE	3.0 ABC	10 AB	18 AB	29 AB	42 A	64 A	86 A
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	2.2 F	2.2 DE	9 ABCD	15 ABCD	25 ABC	26 BCD	41 BCD	57 BC
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	3.5 BC	3.0 ABC	8 ABCD	14 ABCD	21 ABCD	33 AB	51 AB	68 AB
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	3.1 CD	2.7 BC	10 AB	18 AB	27 AB	32 AB	50 AB	67 AB
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	2.0 FG	1.4 GH	9 ABC	16 ABC	27 AB	5 GHI	10 FGHI	18 EFGH
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	2.2 F	1.5 FGH	7 ABCD	12 ABCD	19 ABCD	7 FGHI	13 FGHI	23 EFG
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	3.0 CD	1.9 EF	14 A	24 A	38 A	16 CDEF	27 CDEF	40 CDE
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	2.7 DE	1.8 EFG	9 ABCD	14 ABCD	22 ABCD	12 EFGH	21 DEFG	30 DEFG
Summary Statistics									
Average		3.1	2.4	7	11	18	18	28	38
Standard Error		0.2	0.2	3	5	7	5	7	10
Min		1.5	0.7	0	1	1	-2	-3	-6
Max		4.2	3.3	14	24	38	42	64	86
Range		2.7	2.6	14	24	37	44	68	92
ANOVA p-values									
- Variety		<0.001	<0.001	0.009	0.005	0.003	<0.001	<0.001	<0.001
- Location									
- Variety x Location									

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

¶ Analyzed using near infrared spectroscopy (NIRS) with the appropraite calibration for each species. Reported on a 100% DM basis.

†† Estimated using quality constituents from NIRS inputted into the UGA cover crop nitrogen calculator.

Table 15-a. By location mean forage quality of 16 cover crop varieties and 8 mixes planted in early Oct. 2021, in small plot replicated trials, at the Middle Tennessee AgResearch and Education Center, in Spring Hill, Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	CP¶		ADF¶		NDF¶	
		Apr	May	Apr	May	Apr	May
Driller	Radish						
Bates RS4	Cereal Rye	9.6 G	4.5 I	29.2 BC	42.9 AB	58.8 A	76.2 A
Yankee	Cereal Rye	13.6 F	8.0 H	19.2 FGH	33.1 F	43.6 C	65.0 B
TN1902	Wheat	15.1 EF	8.4 GH	21.1 EF	27.8 H	43.4 C	54.7 DE
FIXatioN	Clover, Balansa	22.0 BC	20.1 AB	16.7 H	23.2 I	19.7 H	27.8 K
Balady	Clover, Berseem						
Frosty	Clover, Berseem	24.1 AB	19.6 AB	19.3 FGH	28.0 H	25.1 H	33.4 IJK
Dixie	Clover, Crimson	23.6 AB	15.9 CD	18.9 FGH	32.7 FG	24.0 H	39.2 HI
Kentucky Pride	Clover, Crimson	24.5 AB	18.2 ABC	17.6 GH	29.4 GH	20.9 H	35.5 HIJ
eNhance	Clover, Persian						
Dynamite	Clover, Red	25.5 A	20.9 A	19.6 FG	26.5 HI	23.1 H	32.3 JK
Q	Clover, Red	24.6 AB	20.5 A	21.0 EF	27.1 H	25.4 GH	33.4 IJK
AU Merit	Vetch, Hairy	26.2 A	19.5 AB	24.1 D	35.8 DEF	30.3 FG	41.6 GH
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	17.6 DE	18.6 ABC	28.2 C	36.8 DE	44.4 C	48.7 EFG
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	13.7 F	13.5 DE	30.8 AB	40.7 BC	51.8 B	57.9 CD
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	21.9 BC	18.7 ABC	23.3 DE	34.1 EF	34.5 DEF	45.8 FG
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	19.6 CD	17.1 BC	24.4 D	33.3 F	38.1 D	45.7 FG
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	12.4 FG	8.7 GH	31.9 A	44.7 A	54.3 AB	66.2 B
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	13.5 F	9.3 FGH	30.4 ABC	43.0 AB	52.2 B	64.1 BC
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	19.0 CD	12.1 EF	21.0 EF	37.9 CD	32.3 EF	54.7 DE
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	17.2 DE	11.2 EFG	23.1 DE	34.2 EF	36.8 DE	49.9 EF
Summary Statistics							
Average		19.1	14.7	23.3	33.9	36.6	48.4
Standard Error		1.1	1.1	0.9	1.3	1.8	2.3
Min		9.6	4.5	16.7	23.2	19.7	27.8
Max		26.2	20.9	31.9	44.7	58.8	76.2
Range		16.7	16.4	15.2	21.6	39.1	48.4
ANOVA p-values							
- Variety		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
- Location							
- Variety x Location							

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

¶ Analyzed using near infrared spectroscopy (NIRS) with the appropraite calibration for each species. Reported on a 100% DM basis.

Table 15-b. By location mean forage quality of 16 cover crop varieties and 8 mixes planted in early Oct. 2021, in small plot replicated trials, at at the Middle Tennessee AgResearch and Education Center, in Spring Hill, Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	Ash¶		Fat¶		Lignin¶	
		Apr	May	Apr	May	Apr†	May
Driller	Radish						
Bates RS4	Cereal Rye	1.7 H	0.2 H	2.1 HI	1.4 I	3.2 E	6.3 BC
Yankee	Cereal Rye	1.7 H	1.3 GH	3.3 A	2.3 AB	2.4 F	3.6 GH
TN1902	Wheat	4.0 EFG	0.0 H	2.8 B	2.0 DEF	2.1 F	3.0 H
FIXatioN	Clover, Balansa	9.5 A	9.4 A	2.2 GHI	2.1 BCDE	3.6 CDE	4.3 FG
Balady	Clover, Berseem						
Frosty	Clover, Berseem	5.9 CD	7.5 B	2.3 FGH	2.2 BC	3.6 DE	5.3 DE
Dixie	Clover, Crimson	6.8 BC	5.4 CD	2.5 DEF	1.8 FG	4.0 BCD	6.7 AB
Kentucky Pride	Clover, Crimson	7.2 B	6.4 BC	2.4 EFG	1.9 EFG	4.0 BCD	5.7 CD
eNhance	Clover, Persian						
Dynamite	Clover, Red	6.1 BCD	7.4 B	2.3 FGH	2.2 BCD	4.0 BCD	4.8 EF
Q	Clover, Red	6.3 BC	7.4 B	2.3 FGHI	2.2 BCD	4.6 B	5.3 DE
AU Merit	Vetch, Hairy	6.2 BC	5.6 CD	2.5 CDE	2.2 BCDE	5.4 A	7.6 A
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	4.0 EFG	5.3 CDE	2.3 EFGH	2.2 BC	3.9 BCD	6.0 BCD
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	4.0 EFG	5.0 DE	2.2 GHI	1.9 FG	3.8 CDE	6.4 BC
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	5.6 CD	5.4 CD	2.7 BC	2.5 A	4.3 BC	5.4 DE
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	4.3 EF	5.1 CDE	2.5 CDE	2.1 BCDE	3.6 DE	5.6 CDE
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	3.1 FG	2.9 F	2.0 I	1.5 HI	3.7 CDE	6.8 AB
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	2.8 GH	3.4 F	2.2 GHI	1.6 HI	3.4 DE	6.5 B
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	4.9 DE	3.9 EF	2.6 BCD	2.0 CDEF	3.6 DE	5.7 CD
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	4.3 EF	2.7 FG	2.4 EFG	1.7 GH	3.6 DE	5.7 CD
Summary Statistics							
Average		4.9	4.7	2.4	2.0	3.7	5.6
Standard Error		0.5	0.5	0.1	0.1	0.2	0.3
Min		1.7	0.0	2.0	1.4	2.1	3.0
Max		9.5	9.4	3.3	2.5	5.4	7.6
Range		7.8	9.4	1.3	1.1	3.3	4.6
ANOVA p-values							
- Variety		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
- Location							
- Variety x Location							

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

¶ Analyzed using near infrared spectroscopy (NIRS) with the appropraite calibration for each species. Reported on a 100% DM basis.

Table 16. Across location mean biomass and weed suppression of 16 cover crop varieties and 8 mixes planted in early Nov. 2021, in small plot replicated trials, at two University of Tennessee AgResearch and Education Center locations, in Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	Cover Crop Biomass (DM lb/ac)		Weed Biomass (DM lb/ac)	
		Apr	May	Apr	May
Driller	Radish	16 J	76 H	55 DEFG	280 ABC
Bates RS4	Cereal Rye	1043 BC	4124 AB	60 CDEF	37 EF
Yankee	Cereal Rye	522 EFGH	3162 BCD	57 CDEF	5 F
TN1902	Wheat	408 EFGH	2268 DEF	63 CDEF	10 F
FIXatioN	Clover, Balansa	108 IJ	1704 EFG	239 A	295 AB
Balady	Clover, Berseem	0 J	50 H	52 DEFG	0 F
Frosty	Clover, Berseem	601 DEFG	2927 CD	238 A	324 AB
Dixie	Clover, Crimson	306 GHIJ	2796 CDE	123 ABCD	204 BCDE
Kentucky Pride	Clover, Crimson	366 FGHI	2922 CD	172 ABC	105 CDEF
eNhance	Clover, Persian	290 HIJ	1354 FG	91 BCDE	157 BCDE
Dynamite	Clover, Red	183 IJ	1024 GH	206 AB	382 A
Q	Clover, Red	180 IJ	985 GH	159 ABCD	389 A
AU Merit	Vetch, Hairy	659 DEF	3199 BCD	165 ABCD	50 DEF
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	1419 A	5237 A	89 CDEF	222 ABCD
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	1342 AB	5130 A	31 FG	89 DEF
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	631 DEF	4156 AB	25 FG	15 F
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	622 DEF	3674 BC	144 ABCD	37 EF
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	844 CD	3230 BCD	57 CDEF	60 DEF
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	674 DE	3430 BCD	18 G	40 DEF
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	358 FGHI	3034 BCD	149 ABCD	86 DEF
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	489 EFGH	3381 BCD	44 EFG	73 DEF
Summary Statistics					
Average		527	2755	107	136
Standard Error		109	401	50	72
Min		0	50	18	0
Max		1419	5237	239	389
Range		1419	5187	220	389
ANOVA p-values					
- Variety		**<0.001**	**<0.001**	**<0.001**	**<0.001**
- Location		**<0.001**	**<0.001**	**<0.001**	**0.001**
- Variety x Location		**<0.001**	**0.009**	**0.039**	**N.S.**

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, *P*<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

Table 17. Across location mean cover and height of 16 cover crop varieties and 8 mixes planted in early Nov. 2021, in small plot replicated trials, at two University of Tennessee AgResearch and Education Center locations, in Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	Cover Crop Canopy Cover (%)				Height (in)			
		Dec	Feb	Apr§	May‡‡	Dec	Feb	Apr	May
Driller	Radish	5 CDE	7 J	6 I	3 K	1 G	1 EF	3 HI	9 K
Bates RS4	Cereal Rye	18 A	47 A	30 GH	41 IJ	4 A	7 A	22 B	54 C
Yankee	Cereal Rye	20 A	40 AB	29 GH	49 GHI	4 AB	6 BC	9 CDE	39 D
TN1902	Wheat	8 B	22 CDEF	23 H	29 J	4 CD	5 CD	9 DE	22 FGHI
FIXatioN	Clover, Balansa	1 G	9 IJ	34 FGH	64 DEFGH		1 F	3 HI	20 HI
Balady	Clover, Berseem	1 G	11 HIJ	7 I	2 K		1 F	1 I	0 L
Frosty	Clover, Berseem	2 FG	12 FGHIJ	38 EFG	62 EFGH		1 EF	8 EF	25 FG
Dixie	Clover, Crimson	4 CDEF	14 EFGH	36 FGH	65 DEFGH	1 G	1 EF	5 FGH	21 GHI
Kentucky Pride	Clover, Crimson	5 CDE	13 EFGH	41 DEFG	71 BCDEF	1 G	1 F	4 GH	20 HI
eNhance	Clover, Persian	2 G	10 HIJ	33 GH	51 GHI	1 G	1 F	6 FG	18 IJ
Dynamite	Clover, Red	3 EFG	5 J	30 GH	54 FGHI	1 G	1 F	4 GH	14 JK
Q	Clover, Red	2 FG	8 IJ	36 FGH	66 DEFGH	1 G	1 F	4 GH	14 JK
AU Merit	Vetch, Hairy	1 G	11 GHIJ	61 AB	82 ABCD	1 G	2 E	9 DE	26 F
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	3 DEFG	27 CD	68 A	85 ABC	4 ABCD	7 AB	25 AB	65 A
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	6 BC	31 BC	51 BCDE	80 ABCDE	4 ABC	7 AB	24 AB	63 AB
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	6 BC	24 CDE	58 ABC	89 AB	4 BCDE	6 BC	12 C	40 D
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	3 DEFG	22 CDEF	55 ABCD	91 A	3 DE	5 CD	11 CD	33 E
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	5 CD	20 DEFG	33 GH	49 GHI	4 CD	7 AB	26 A	61 AB
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	6 BC	22 CDEF	35 FGH	48 HI	3 CDEF	5 CD	23 B	59 B
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	8 B	20 DEFG	31 GH	52 FGHI	3 EF	4 D	9 CDE	37 DE
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	6 BC	18 DEFG	47 CDEF	67 CDEFG	3 F	4 D	10 CDE	23 FGH
Summary Statistics									
Average		5	19	37	57	3	3	11	31
Standard Error		1	5	5	7	0	1	1	2
Min		1	5	6	2	1	1	1	0
Max		20	47	68	91	4	7	26	65
Range		19	41	62	89	3	7	25	65
ANOVA p-values									
- Variety		**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**
- Location		**<0.001**	**<0.001**	**<0.001**	**<0.001**	**0.002**	**N.S.**	**<0.001**	**<0.001**
- Variety x Location		**N.S.**	**0.033**	**<0.001**	**<0.001**	**N.S.**	**N.S.**	**0.002**	**<0.001**

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

Table 18. Across location mean nitrogen content and estimated nitrogen release of 16 cover crop varieties and 8 mixes planted in early Nov. 2021, in small plot replicated trials, at two University of Tennessee AgResearch and Education Center locations, in Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	Total Nitrogen¶ (%)		Estimated N Released†† Apr. Term. (lbs/ac)			Estimated N Released†† MayTerm. (lbs/ac)		
		Apr	May	2 wks	4 wks	12 wks	2 wks	4 wks	12 wks
Driller	Radish								
Bates RS4	Cereal Rye	1.8 OP	1.0 I	3 EFG	4 EFGH	7 EFGH	0 I	0 I	1 H
Yankee	Cereal Rye	2.3 MN	1.2 I	2 FG	4 FGH	6 FGH	1 I	2 I	4 H
TN1902	Wheat	2.4 MN	1.3 HI	2 FG	3 GH	5 GH	2 I	4 I	6 H
FIXatioN	Clover, Balansa	3.7 CDEF	3.5 BC	1 FG	3 FGH	4 FGH	20 CDEF	30 CDEF	40 CDEF
Balady	Clover, Berseem								
Frosty	Clover, Berseem	3.7 DEF	3.1 DE	6 ABCD	10 ABCD	16 ABCD	24 BCDE	36 BCD	47 BCD
Dixie	Clover, Crimson	3.8 CDE	2.4 F	3 DEFG	5 DEFG	8 DEFG	17 EFG	26 DEFG	36 DEF
Kentucky Pride	Clover, Crimson	4.0 ABC	2.9 E	5 ABCD	10 ABCD	15 ABCD	24 BCDE	37 BCD	51 BCD
eNhance	Clover, Persian		3.7 AB				22 CDE	33 CDE	44 CDE
Dynamite	Clover, Red		3.9 A				12 FGH	19 FGH	26 FG
Q	Clover, Red	3.4 FGH	3.6 AB	2 DEFG	3 EFGH	5 EFGH	11 GH	17 GH	24 FG
AU Merit	Vetch, Hairy	4.3 AB	3.8 AB	8 ABC	13 ABC	20 ABC	35 A	53 A	70 A
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	2.9 IJK	2.4 F	9 AB	15 AB	23 AB	27 ABCD	42 ABC	56 ABC
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	2.7 JKL	2.3 FG	6 ABCD	11 ABCD	17 ABCD	20 DEF	31 CDE	43 CDE
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	3.7 DEF	3.0 E	5 CDEF	8 CDEF	12 CDEF	29 ABC	43 ABC	58 ABC
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	3.7 DEF	3.3 CD	6 ABCD	10 ABCD	14 ABCD	31 AB	47 AB	63 AB
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	2.2 MN	1.6 H	3 DEFG	5 DEFG	9 DEFG	5 HI	8 HI	13 GH
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	2.4 LMN	1.6 H	3 DEFG	5 DEFG	8 DEFG	5 HI	9 HI	14 GH
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	3.0 IJK	2.1 G	3 EFG	4 EFGH	6 EFGH	13 FGH	20 EFGH	27 EFG
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	3.1 GHI	2.3 FG	4 DEFG	6 DEFG	9 DEFG	17 EFG	26 DEFG	36 DEF
Summary Statistics									
Average		3.1	2.6	4	7	11	17	25	35
Standard Error		0.2	0.1	1	2	4	3	5	6
Min		1.8	1.0	1	3	4	0	0	1
Max		4.3	3.9	9	15	23	35	53	70
Range		2.5	2.9	8	12	20	35	53	69
ANOVA p-values									
- Variety		**<0.001**	**<0.001**	**<0.001**	**0.001**	**0.001**	**<0.001**	**<0.001**	**<0.001**
- Location		**N.S.**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**
- Variety x Location		**0.001**	**0.001**	**N.S.**	**N.S.**	**N.S.**	**<0.001**	**<0.001**	**<0.001**

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

¶ Analyzed using near infrared spectroscopy (NIRS) with the appropraite calibration for each species. Reported on a 100% DM basis.

†† Estimated using quality constituents from NIRS inputted into the UGA cover crop nitrogen calculator.

Table 19-a. Across location mean forage quality of 16 cover crop varieties and 8 mixes planted in early Nov. 2021, in small plot replicated trials, at two University of Tennessee AgResearch and Education Center locations, in Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	CP¶ Apr	CP¶ May	ADF¶ Apr	ADF¶ May	NDF¶ Apr	NDF¶ May
Driller	Radish						
Bates RS4	Cereal Rye	11.3 OP	6.4 I	29.0 ABC	40.3 A	55.9 AB	72.7 A
Yankee	Cereal Rye	14.2 MN	7.7 I	19.7 ILMNO	34.3 BC	43.6 EFGH	66.1 B
TN1902	Wheat	14.7 MN	8.2 HI	20.7 HIJKL	32.3 CD	40.8 GH	61.8 BC
FIXatioN	Clover, Balansa	22.9 CDEF	21.8 BC	17.0 QRS	21.8 EF	19.9 OP	25.7 JK
Balady	Clover, Berseem						
Frosty	Clover, Berseem	22.9 DEF	19.2 DE	19.7 ILMNO	30.8 D	24.9 LMN	37.9 HI
Dixie	Clover, Crimson	23.7 CDE	15.2 F	18.7 MNOP	35.0 BC	22.9 NOP	41.2 HI
Kentucky Pride	Clover, Crimson	25.2 ABC	18.2 E	17.7 PQRS	30.2 D	21.1 OP	36.3 I
eNhance	Clover, Persian		23.1 AB		19.2 F		21.7 K
Dynamite	Clover, Red		24.3 A		24.8 E		29.5 J
Q	Clover, Red	21.3 FGH	22.6 AB	21.6 DEFG	25.2 E	27.5 KLM	31.0 J
AU Merit	Vetch, Hairy	27.1 AB	23.5 AB	21.5 GHJK	32.9 BCD	25.8 LMN	38.3 HI
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	18.3 IJK	15.1 F	27.3 ABC	40.0 A	42.5 FGH	54.8 DE
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	16.7 JKL	14.4 FG	27.7 ABC	40.2 A	44.5 CDEF	55.5 DE
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	22.9 DEF	18.5 E	22.7 DEFG	34.9 BC	33.5 IJ	47.5 F
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	23.0 DEF	20.6 CD	23.3 DEF	33.2 BCD	32.3 IJ	41.9 GH
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	14.0 MN	9.9 H	27.8 ABC	43.0 A	47.0 CDE	61.6 BC
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	14.9 LMN	9.8 H	28.5 ABC	41.9 A	47.8 CD	60.2 CD
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	18.5 IJK	13.2 G	19.4 LMNO	36.3 B	31.9 IJ	51.1 EF
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	19.7 GHI	14.1 FG	20.3 HIJKL	35.1 BC	30.8 IJK	46.4 FG
Summary Statistics							
Average		19.5	16.1	22.5	33.2	34.9	46.4
Standard Error		1.0	0.7	0.6	1.3	1.3	1.9
Min		11.3	6.4	17.0	19.2	19.9	21.7
Max		27.1	24.3	29.0	43.0	55.9	72.7
Range		15.8	17.9	11.9	23.8	36.0	51.0
ANOVA p-values							
- Variety		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
- Location		N.S.	<0.001	<0.001	<0.001	<0.001	<0.001
- Variety x Location		0.001	0.001	<0.001	N.S.	0.038	N.S.

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

¶ Analyzed using near infrared spectroscopy (NIRS) with the appropraite calibration for each species. Reported on a 100% DM basis.

Table 19-b. Across location mean forage quality of 16 cover crop varieties and 8 mixes planted in early Nov. 2021, in small plot replicated trials, at two University of Tennessee AgResearch and Education Center locations, in Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	Ash¶		Fat¶		Lignin¶	
		Apr	May	Apr	May	Apr†	May
Driller	Radish						
Bates RS4	Cereal Rye	3.0 MN	0.6 L	2.4 NO	1.7 GHI	3.4 GHI	5.6 CDE
Yankee	Cereal Rye	3.2 LMN	2.0 K	3.4 AB	2.4 AB	2.7 JKL	4.2 F
TN1902	Wheat	4.7 GHIJ	1.9 K	3.2 CD	2.0 EF	2.2 MNO	3.8 F
FIXatioN	Clover, Balansa	10.4 AB	9.6 AB	2.8 FGH	2.4 AB	3.4 DEFG	3.7 FG
Balady	Clover, Berseem						
Frosty	Clover, Berseem	7.2 CD	8.7 BC	2.7 HIJK	2.3 BCD	3.4 DEFG	5.4 E
Dixie	Clover, Crimson	6.9 CD	6.5 EFG	2.6 JKLM	1.8 FGHI	3.8 DEF	7.0 A
Kentucky Pride	Clover, Crimson	7.1 CD	7.2 DEF	2.8 HI	2.1 CDE	3.6 DEFG	5.7 CDE
eNhance	Clover, Persian		10.5 A		2.4 ABC		3.0 G
Dynamite	Clover, Red		7.5 D		2.6 A		4.4 F
Q	Clover, Red	6.8 CDE	7.7 CD	2.7 HIJ	2.6 A	4.3 ABC	4.2 F
AU Merit	Vetch, Hairy	6.2 CDEF	7.4 DE	2.7 HIJ	2.3 BC	4.7 ABC	6.5 AB
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	4.8 GHIJ	5.4 GH	2.5 NO	1.9 EFG	3.6 DEFG	6.3 ABC
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	4.5 IJK	5.2 HI	2.5 KLMN	1.9 EFG	3.4 DEFG	6.5 AB
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	5.1 FGHIJ	6.1 FGH	3.0 EFG	2.4 ABC	3.5 DEFG	5.4 E
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	5.6 EFGH	5.5 GH	2.8 HI	2.3 BCD	3.8 DEF	5.5 DE
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	4.2 IJKL	4.0 J	2.5 LMN	1.6 I	3.3 GHI	6.7 AB
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	4.0 JKLM	4.9 HIJ	2.5 NO	1.6 HI	3.4 DEFG	6.7 AB
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	5.3 FGHI	4.2 IJ	3.1 CDE	2.1 DE	2.9 JKL	5.6 CDE
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	5.6 EFGH	3.9 J	2.8 HI	1.8 FGH	3.4 GHI	6.1 BCD
Summary Statistics							
Average		5.6	5.7	2.8	2.1	3.5	5.4
Standard Error		0.6	0.4	0.1	0.1	0.2	0.3
Min		3.0	0.6	2.4	1.6	2.2	3.0
Max		10.4	10.5	3.4	2.6	4.7	7.0
Range		7.4	9.9	1.0	1.0	2.6	4.0
ANOVA p-values							
- Variety		**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**
- Location		**<0.001**	**0.009**	**<0.001**	**<0.001**	**N.S.**	**<0.001**
- Variety x Location		**N.S.**	**0.042**	**0.004**	**N.S.**	**<0.001**	**N.S.**

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

¶ Analyzed using near infrared spectroscopy (NIRS) with the appropraite calibration for each species. Reported on a 100% DM basis.

Table 20. By location mean biomass and weed suppression of 16 cover crop varieties and 8 mixes planted in early Nov. 2021, in small plot replicated trials, at the East Tennessee AgResearch and Education Center, in Knoxville, Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	Cover Crop Biomass (DM lb/ac)		Weed Biomass (DM lb/ac)	
		Apr	May	Apr	May
Driller	Radish	31 IJ	152 J	110 A	559 A
Bates RS4	Cereal Rye	1286 B	5383 BC	94 A	0 G
Yankee	Cereal Rye	653 DEFG	3794 DEFG	73 A	0 G
TN1902	Wheat	449 FGHI	2284 GHI	0 A	0 G
FIXatioN	Clover, Balansa	204 HIJ	2289 GHI	141 A	507 ABC
Balady	Clover, Berseem	0 J	0 J	5 A	0 G
Frosty	Clover, Berseem	1176 BC	4756 BCD	136 A	277 BCDE
Dixie	Clover, Crimson	507 FGH	3151 EFGH	52 A	225 DEFG
Kentucky Pride	Clover, Crimson	622 EFGH	3611 DEFG	52 A	167 DEFG
eNhance	Clover, Persian	580 EFGH	2671 FGHI	115 A	267 CDEF
Dynamite	Clover, Red	366 GHIJ	1735 HI	115 A	397 ABCD
Q	Clover, Red	350 GHIJ	1563 IJ	125 A	517 AB
AU Merit	Vetch, Hairy	1061 BCD	3611 DEFG	47 A	37 FG
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	1981 A	6104 AB	63 A	329 ABCD
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	2009 A	7369 A	0 A	68 FG
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	956 BCDE	5624 B	0 A	47 FG
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	831 CDEF	4636 BCDE	5 A	73 FG
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	1270 B	3732 DEFG	0 A	94 EFG
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	1071 BCD	4672 BCDE	26 A	57 FG
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	559 EFGH	3841 CDEF	57 A	84 EFG
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	726 DEFG	3867 CDEF	10 A	141 EFG
Summary Statistics					
Average		795	3564	58	183
Standard Error		153	561	65	95
Min		0	0	0	0
Max		2009	7369	141	559
Range		2009	7369	141	559
ANOVA p-values					
- Variety		<0.001	<0.001	N.S.	<0.001
- Location					
- Variety x Location					

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, $P<0.05$). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

Table 21. By location mean cover and height of 16 cover crop varieties and 8 mixes planted in early Nov. 2021, in small plot replicated trials, at the East Tennessee AgResearch and Education Center, in Knoxville, Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	Cover Crop Canopy Cover (%)				Height (in)			
		Dec	Feb	Apr[§]	May[‡‡]	Dec	Feb	Apr	May
Driller	Radish	7 CDE	10 F	9 J	4 H	1 C	1 FG	6 EFGH	18 JK
Bates RS4	Cereal Rye	18 A	62 A	34 HI	54 FG	4 A	8 A	25 B	60 C
Yankee	Cereal Rye	20 A	54 AB	39 GHI	58 EFG	4 A	5 BCD	10 CDE	46 DE
TN1902	Wheat	11 B	38 C	29 I	39 G	4 A	4 DE	8 DEFG	22 HIJK
FIXatioN	Clover, Balansa	2 G	15 F	59 DEF	87 ABCD	1 C	1 G	5 FGH	25 GHI
Balady	Clover, Berseem	2 G	19 EF	9 J	0 H	1 C	0 G	0 I	0 L
Frosty	Clover, Berseem	3 G	21 DEF	67 BCDE	89 ABC	1 C	1 FG	10 CDE	33 F
Dixie	Clover, Crimson	7 CDE	21 DEF	60 DEF	70 BCDE	1 C	1 FG	4 GH	24 GHIJK
Kentucky Pride	Clover, Crimson	6 DEF	21 DEF	66 BCDE	84 ABCD	1 C	1 G	4 H	22 HIJK
eNhance	Clover, Persian	3 FG	17 EF	63 CDEF	96 AB	1 C	1 G	8 DEF	26 GH
Dynamite	Clover, Red	4 EFG	9 F	58 EFG	86 ABCD	1 C	1 G	5 FGH	18 K
Q	Clover, Red	3 FG	14 F	57 EFG	86 ABCD	1 C	1 G	5 FGH	19 IJK
AU Merit	Vetch, Hairy	2 G	19 DEF	91 A	96 AB	2 C	3 EF	11 CD	30 FG
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	5 EFG	43 BC	82 ABC	89 ABC	4 A	7 A	30 A	68 AB
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	7 BCDE	53 AB	78 ABCD	90 ABC	4 A	7 A	28 AB	73 A
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	7 CDE	39 BC	85 AB	92 ABC	4 A	6 BC	13 C	48 D
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	4 EFG	39 BC	72 ABCD	99 A	4 AB	5 BCD	14 C	40 E
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	8 BCD	34 CD	49 FGH	61 DEFG	4 AB	7 AB	26 AB	66 BC
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	10 BC	41 BC	50 FGH	71 BCDE	4 AB	5 BCD	25 B	65 BC
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	9 BCD	31 CDE	48 FGHI	65 CDEF	3 B	5 CD	10 CD	44 DE
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	8 BCD	32 CDE	54 EFG	68 CDEF	3 B	4 CD	10 CD	24 GHIJ
Summary Statistics									
Average		7	30	55	71	3	4	12	37
Standard Error		1	6	7	10	0	1	1	3
Min		2	9	9	0	1	0	0	0
Max		20	62	91	99	4	8	30	73
Range		19	53	82	99	3	8	30	73
ANOVA p-values									
- Variety		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
- Location									
- Variety x Location									

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

Table 22. By location mean nitrogen content and estimated nitrogen release of 16 cover crop varieties and 8 mixes planted in early Nov. 2021, in small plot replicated trials, at the East Tennessee AgResearch and Education Center, in Knoxville, Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	Total Nitrogen¶ (%)		Estimated N Released†† Apr. Term. (lbs/ac)			Estimated N Released†† MayTerm. (lbs/ac)		
		Apr	May	2 wks	4 wks	12 wks	2 wks	4 wks	12 wks
Driller	Radish	3.1 DE	2.1 E	0 G	1 H	1 H	0 GH	1 GH	1 I
Bates RS4	Cereal Rye	1.8 I	0.9 H	3 DEFG	5 EFGH	8 EFGH	-1 H	-2 H	-2 I
Yankee	Cereal Rye	2.1 HI	1.1 GH	3 EFG	4 FGH	7 EFGH	0 H	1 H	3 I
TN1902	Wheat	2.4 GH	1.5 FG	2 FG	3 GH	5 GH	3 GH	5 GH	8 HI
FIXatioN	Clover, Balansa	3.8 BC	3.2 B	2 FG	4 FGH	6 FGH	25 BCD	38 CD	50 CDEF
Balady	Clover, Berseem								
Frosty	Clover, Berseem	3.8 BC	2.8 CD	12 AB	20 AB	31 AB	36 AB	54 ABC	71 ABC
Dixie	Clover, Crimson	3.8 BC	2.1 E	5 CDEF	8 DEFG	13 DEFG	15 DE	23 DEF	33 EFG
Kentucky Pride	Clover, Crimson	4.0 AB	2.6 D	10 ABC	17 ABC	27 ABC	24 CDE	37 CDE	51 CDE
eNhance	Clover, Persian	4.1 AB	3.8 A	8 ABCD	13 ABCD	20 ABCD	44 A	66 A	88 A
Dynamite	Clover, Red	4.3 A	3.9 A	4 DEFG	7 EFGH	11 EFGH	21 DE	31 DE	43 DEF
Q	Clover, Red	4.1 AB	3.7 A	4 DEFG	6 EFGH	10 EFGH	18 DE	27 DE	39 DEF
AU Merit	Vetch, Hairy	4.3 A	3.8 A	13 AB	21 A	32 A	38 A	57 AB	75 AB
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	3.0 EF	2.7 D	13 A	21 A	33 A	35 ABC	53 ABC	71 ABC
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	2.8 EF	2.2 E	10 ABC	16 ABCD	25 ABCD	25 BCD	40 BCD	56 BCD
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	3.6 CD	3.0 BCD	6 CDEF	11 CDEF	16 CDEF	38 A	58 A	77 AB
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	3.5 CD	3.1 BC	8 BCDE	13 BCDE	19 BCDE	36 AB	54 ABC	72 ABC
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	2.1 HI	1.4 G	5 CDEF	8 CDEF	13 CDEF	3 GH	5 GH	10 HI
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	2.3 GH	1.4 G	4 DEFG	7 EFGH	11 EFGH	4 FGH	7 FGH	13 GHI
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	2.6 FG	1.8 EF	4 DEFG	6 EFGH	9 EFGH	13 EFG	20 EFG	28 FGH
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	2.9 EF	2.0 E	5 CDEF	8 CDEF	13 DEFG	15 DEF	24 DEF	33 EFG
Summary Statistics									
Average		3.2	2.5	6	10	16	20	30	41
Standard Error		0.2	0.2	2	3	5	4	6	9
Min		1.8	0.9	0	1	1	-1	-2	-2
Max		4.3	3.9	13	21	33	44	66	88
Range		2.5	3.0	13	20	32	45	68	90
ANOVA p-values									
- Variety - Location - Variety x Location		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

¶ Analyzed using near infrared spectroscopy (NIRS) with the appropraite calibration for each species. Reported on a 100% DM basis.

†† Estimated using quality constituents from NIRS inputted into the UGA cover crop nitrogen calculator.

Table 23-a. By location mean forage quality of 16 cover crop varieties and 8 mixes planted in early Nov. 2021, in small plot replicated trials, at the Middle Tennessee AgResearch and Education Center, in Knoxville, Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	CP¶		ADF¶		NDF¶	
		Apr	May	Apr	May	Apr	May
Driller	Radish	19.4 DE	13.3 E	23.7 BC	35.0 EFG	28.3 FG	43.5 GHI
Bates RS4	Cereal Rye	11.4 I	5.8 H	28.2 A	43.4 ABC	57.6 A	76.3 A
Yankee	Cereal Rye	13.1 HI	7.1 GH	21.1 DEFG	36.7 DEF	45.8 BCD	68.9 B
TN1902	Wheat	14.8 GH	9.2 FG	23.0 BCD	30.2 GH	43.7 CD	58.5 CD
FIXatioN	Clover, Balansa	23.9 BC	20.2 B	16.4 H	25.5 HI	17.7 I	29.6 JK
Balady	Clover, Berseem						
Frosty	Clover, Berseem	23.5 BC	17.2 CD	21.9 BCDE	35.2 EF	26.1 GH	42.3 HI
Dixie	Clover, Crimson	23.5 BC	13.3 E	21.5 CDEF	39.2 CDEF	25.4 GH	46.3 GHI
Kentucky Pride	Clover, Crimson	25.0 AB	16.4 D	19.2 G	34.5 FG	21.7 HI	40.9 I
eNhance	Clover, Persian	25.4 AB	24.0 A	15.7 H	21.9 I	17.3 I	24.8 K
Dynamite	Clover, Red	26.7 A	24.3 A	20.5 EFG	27.2 H	24.9 GH	32.6 J
Q	Clover, Red	25.4 AB	23.2 A	20.0 FG	27.3 H	24.6 GH	33.5 J
AU Merit	Vetch, Hairy	27.0 A	23.8 A	23.5 BC	35.2 EF	26.3 GH	42.1 I
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	18.7 EF	16.6 D	28.4 A	40.7 ABCD	43.0 D	54.3 DEF
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	17.5 EF	13.4 E	29.2 A	43.0 ABC	45.6 BCD	59.4 CD
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	22.3 CD	18.7 BCD	24.1 B	37.6 DEF	34.7 E	49.6 FGH
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	21.7 CD	19.3 BC	23.3 BCD	35.6 EF	33.0 EF	45.0 GHI
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	13.1 HI	8.7 G	29.3 A	44.3 AB	48.7 BC	62.9 BC
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	14.1 GH	8.6 G	29.8 A	44.8 A	48.4 B	63.8 BC
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	16.2 FG	11.4 EF	22.1 BCDE	39.7 BCDE	36.4 E	57.0 CDE
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	18.1 EF	12.4 E	22.6 BCDE	37.8 DEF	34.9 E	50.2 EFG
Summary Statistics							
Average		20.0	15.3	23.2	35.7	34.2	49.1
Standard Error		1.2	0.9	0.8	1.7	1.7	2.6
Min		11.4	5.8	15.7	21.9	17.3	24.8
Max		27.0	24.3	29.8	44.8	57.6	76.3
Range		15.6	18.5	14.0	23.0	40.3	51.5
ANOVA p-values							
- Variety		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
- Location							
- Variety x Location							

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

¶ Analyzed using near infrared spectroscopy (NIRS) with the appropraite calibration for each species. Reported on a 100% DM basis.

Table 23-b. By location mean forage quality of 16 cover crop varieties and 8 mixes planted in early Nov. 2021, in small plot replicated trials, at at the East Tennessee AgResearch and Education Center, in Knoxville, Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	Ash¶		Fat¶		Lignin¶	
		Apr	May	Apr	May	Apr†	May
Driller	Radish	6.0 DEF	3.8 IJ	1.8 I	1.1 I	5.8 A	7.0 ABC
Bates RS4	Cereal Rye	3.3 G	1.0 L	2.4 H	1.6 FGH	3.4 D	6.4 BCDE
Yankee	Cereal Rye	3.5 G	1.9 KL	3.4 A	2.3 BC	2.8 EF	4.7 FG
TN1902	Wheat	5.4 EF	3.3 JK	3.2 AB	2.1 CDE	2.3 F	3.3 I
FIXatioN	Clover, Balansa	10.1 A	9.1 AB	2.9 DEF	2.2 BCD	2.8 F	4.2 GHI
Balady	Clover, Berseem						
Frosty	Clover, Berseem	8.4 B	8.8 ABC	2.8 DEF	2.0 CDE	3.7 D	6.1 CDE
Dixie	Clover, Crimson	8.1 BC	6.3 EFG	2.7 FG	1.7 FGH	4.3 BC	7.8 A
Kentucky Pride	Clover, Crimson	8.5 B	7.2 DE	2.9 CDE	2.1 CDE	3.5 D	6.4 BCDE
eNhance	Clover, Persian	10.2 A	9.9 A	2.9 CDE	2.3 ABC	2.5 F	3.5 HI
Dynamite	Clover, Red	7.6 BCD	8.1 BCD	2.9 CDE	2.5 AB	3.3 DE	4.6 G
Q	Clover, Red	6.8 CDE	7.5 CDE	2.9 CDE	2.6 A	3.3 DE	4.4 GH
AU Merit	Vetch, Hairy	7.5 BCD	8.2 BCD	2.8 DEF	2.2 BCD	4.9 B	6.6 BCDE
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	5.7 EF	6.3 EFG	2.5 H	1.9 DEF	3.8 CD	6.5 BCDE
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	4.7 FG	5.6 FGH	2.6 GH	1.8 EFG	3.6 D	6.6 BCD
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	5.7 EF	6.9 DEF	3.0 CD	2.3 ABC	3.5 D	5.7 DE
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	5.5 EF	5.1 GHI	2.9 CDEF	2.4 ABC	3.4 D	5.6 EF
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	4.8 FG	4.7 HIJ	2.4 H	1.5 GH	3.7 CD	7.2 AB
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	4.7 FG	4.9 GHI	2.4 H	1.5 H	3.9 CD	7.3 AB
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	5.7 EF	4.4 HIJ	3.1 BC	2.1 CDE	3.3 D	5.9 DE
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	5.6 EF	4.4 HIJ	2.8 EF	1.8 EFG	3.5 D	6.7 BCD
Summary Statistics							
Average		6.4	5.9	2.8	2.0	3.6	5.8
Standard Error		0.7	0.6	0.1	0.1	0.2	0.4
Min		3.3	1.0	1.8	1.1	2.3	3.3
Max		10.2	9.9	3.4	2.6	5.8	7.8
Range		7.0	8.9	1.6	1.5	3.5	4.5
ANOVA p-values							
- Variety		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
- Location							
- Variety x Location							

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

¶ Analyzed using near infrared spectroscopy (NIRS) with the appropraite calibration for each species. Reported on a 100% DM basis.

Table 24. By location mean biomass and weed suppression of 16 cover crop varieties and 8 mixes planted in early Nov. 2021, in small plot replicated trials, at the Middle Tennessee AgResearch and Education Center, in Spring Hill, Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	Cover Crop Biomass (DM lb/ac)		Weed Biomass (DM lb/ac)	
		Apr	May	Apr	May
Driller	Radish	0 D	0 E	0 E	0 A
Bates RS4	Cereal Rye	800 AB	2864 AB	26 E	73 A
Yankee	Cereal Rye	390 BCD	2530 BCD	42 DE	10 A
TN1902	Wheat	366 CD	2253 BCD	125 BCDE	21 A
FIXatioN	Clover, Balansa	11 D	1118 CDE	336 A	83 A
Balady	Clover, Berseem	0 D	99 E	98 CDE	0 A
Frosty	Clover, Berseem	26 D	1098 DE	340 A	371 A
Dixie	Clover, Crimson	105 D	2441 BCD	193 ABCD	183 A
Kentucky Pride	Clover, Crimson	110 D	2232 BCD	293 A	42 A
eNhance	Clover, Persian	0 D	37 E	68 DE	47 A
Dynamite	Clover, Red	0 D	314 E	298 A	366 A
Q	Clover, Red	10 D	408 E	193 ABCD	261 A
AU Merit	Vetch, Hairy	256 CD	2786 B	282 AB	63 A
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	857 A	4369 A	115 CDE	115 A
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	674 ABC	2890 AB	63 DE	110 A
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	306 CD	2689 ABCD	50 DE	0 A
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	413 BCD	2712 BC	282 AB	0 A
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	418 BCD	2728 B	115 CDE	26 A
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	277 CD	2187 BCD	10 E	22 A
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	157 D	2226 BCD	240 ABC	89 A
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	251 CD	2895 AB	78 CDE	5 A
Summary Statistics					
Average		258	1946	155	90
Standard Error		155	574	65	97
Min		0	0	0	0
Max		857	4369	340	371
Range		857	4369	340	371
ANOVA p-values					
- Variety		<0.001	<0.001	<0.001	N.S.
- Location					
- Variety x Location					

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, *P* <0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

Table 25. By location mean cover and height of 16 cover crop varieties and 8 mixes planted in early Nov. 2021, in small plot replicated trials, at the Middle Tennessee AgResearch and Education Center, in Spring Hill, Tennessee, and evaluated from Fall 2021 to Spring 2022.

		Cover Crop Canopy Cover (%)				Height (in)			
Variety	Common Name	Dec	Feb	Apr[§]	May[‡‡]	Dec	Feb	Apr	May
Driller	Radish	3 CDEF	4 C	2 F	2 G	1 F	1 D	0 J	0 J
Bates RS4	Cereal Rye	19 A	31 A	26 BCDE	28 EFG	5 A	7 A	20 B	48 C
Yankee	Cereal Rye	19 A	26 AB	19 CDEF	40 CDEF	4 AB	6 A	9 CDE	32 D
TN1902	Wheat	5 BCD	6 C	17 DEF	19 FG	3 CDE	6 AB	10 C	22 FG
FIXatioN	Clover, Balansa	0 F	2 C	9 EF	40 CDEF		1 D	2 IJ	15 GHI
Balady	Clover, Berseem	0 F	3 C	4 F	4 G		1 D	1 IJ	0 J
Frosty	Clover, Berseem	1 EF	4 C	9 EF	35 DEF		1 D	5 EFGH	16 GH
Dixie	Clover, Crimson	2 CDEF	7 C	12 DEF	61 ABCD	1 F	1 D	6 DEFG	18 G
Kentucky Pride	Clover, Crimson	3 CDEF	6 C	16 DEF	57 ABCD	1 F	1 D	5 FGHI	18 FG
eNhance	Clover, Persian	0 F	2 C	2 F	6 G	1 F	1 D	4 GHIJ	10 HI
Dynamite	Clover, Red	1 EF	1 C	2 F	22 EFG	1 F	1 D	4 GHI	9 I
Q	Clover, Red	1 DEF	2 C	15 DEF	46 BCDE	1 F	1 D	2 HIJ	9 I
AU Merit	Vetch, Hairy	0 F	4 C	32 BCD	68 AB	1 F	2 D	7 CDEF	22 FG
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	2 DEF	10 C	53 A	81 A	3 CD	6 A	20 B	61 A
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	4 BCDE	9 C	24 BCDE	71 AB	4 BC	6 AB	20 B	52 BC
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	5 BC	10 BC	30 BCDE	86 A	3 CDE	6 AB	11 C	32 DE
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	1 DEF	6 C	38 ABC	83 A	3 CDE	4 BC	9 CD	25 EF
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	2 CDEF	5 C	17 DEF	38 DEF	3 CD	6 A	25 A	56 AB
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	2 CDEF	4 C	19 CDEF	25 EFG	3 CDE	4 BC	20 B	52 BC
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	7 B	8 C	14 DEF	39 CDEF	3 DE	4 C	8 CDEF	30 DE
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	4 BCDE	4 C	39 AB	65 ABC	2 E	4 C	10 C	22 FG
Summary Statistics									
Average		4	7	19	44	2	3	9	26
Standard Error		1	6	7	10	0	1	1	3
Min		0	1	2	2	1	1	0	0
Max		19	31	53	86	5	7	25	61
Range		19	30	51	84	4	6	25	61
ANOVA p-values									
- Variety		<0.001	0.016	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
- Location									
- Variety x Location									

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

Table 26. By location mean nitrogen content and estimated nitrogen release of 16 cover crop varieties and 8 mixes planted in early Nov. 2021, in small plot replicated trials, at the Middle Tennessee AgResearch and Education Center, in Spring Hill, Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	Total Nitrogen¶ (%)		Estimated N Released†† Apr. Term. (lbs/ac)			Estimated N Released†† MayTerm. (lbs/ac)		
		Apr	May	2 wks	4 wks	12 wks	2 wks	4 wks	12 wks
Driller	Radish								
Bates RS4	Cereal Rye	1.8 H	1.1 J	2 A	3 A	6 A	2 GH	3 GH	4 GH
Yankee	Cereal Rye	2.4 FG	1.3 IJ	2 A	3 A	5 A	1 H	3 GH	5 GH
TN1902	Wheat	2.3 G	1.2 J	2 A	3 A	5 A	1 FGH	2 FGH	5 FGH
FIXatioN	Clover, Balansa	3.5 BCD	3.8 AB	0 A	1 A	1 A	14 BCDE	22 BCDE	30 BCDE
Balady	Clover, Berseem		2.8 DEF				2 EFGH	3 EFGH	3 EFGH
Frosty	Clover, Berseem	3.5 BCD	3.4 BCD	0 A	0 A	1 A	12 DEFG	18 DEFG	24 DEFG
Dixie	Clover, Crimson	3.8 BC	2.7 EF	1 A	2 A	3 A	18 BCDE	28 BCD	39 BCD
Kentucky Pride	Clover, Crimson	4.1 AB	3.2 CD	1 A	3 A	4 A	24 ABC	37 ABC	51 ABC
eNhance	Clover, Persian		3.6 ABC				-1 H	0 H	0 H
Dynamite	Clover, Red		3.9 A				4 FGH	6 FGH	9 FGH
Q	Clover, Red	2.7 EFG	3.5 ABC	0 A	0 A	0 A	5 FGH	7 FGH	9 FGH
AU Merit	Vetch, Hairy	4.4 A	3.7 AB	3 A	5 A	8 A	32 A	49 A	64 A
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	2.9 F	2.2 GH	5 A	8 A	14 A	19 ABCD	31 ABCD	41 ABCD
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	2.6 FG	2.5 EFG	3 A	5 A	8 A	14 CDEF	21 CDEF	29 CDEF
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	3.8 BCD	2.9 DE	3 A	5 A	8 A	19 BCDE	29 BCDE	38 ABCD
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	3.9 B	3.5 ABC	4 A	6 A	10 A	27 AB	41 AB	54 AB
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	2.4 G	1.8 H	2 A	3 A	5 A	7 EFGH	11 DEFG	16 DEFG
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	2.5 FG	1.8 HI	2 A	3 A	6 A	6 EFGH	10 DEFG	14 DEFG
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	3.3 DE	2.4 FG	1 A	2 A	3 A	13 CDEF	20 CDEF	26 DEFG
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	3.4 CD	2.5 EFG	2 A	3 A	5 A	19 BCD	29 BCD	39 BCD
Summary Statistics									
Average		3.1	2.7	2	3	5	12	18	25
Standard Error		0.2	0.2	2	3	5	5	7	9
Min		1.8	1.1	0	0	0	-1	0	0
Max		4.4	3.9	5	8	14	32	49	64
Range		2.6	2.8	6	9	14	33	49	64
ANOVA p-values									
- Variety		<0.001	<0.001	N.S.	N.S.	N.S.	<0.001	<0.001	<0.001
- Location									
- Variety x Location									

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

¶ Analyzed using near infrared spectroscopy (NIRS) with the appropraite calibration for each species. Reported on a 100% DM basis.

†† Estimated using quality constituents from NIRS inputted into the UGA cover crop nitrogen calculator.

Table 27-a. By location mean forage quality of 16 cover crop varieties and 8 mixes planted in early Nov. 2021, in small plot replicated trials, at the Middle Tennessee AgResearch and Education Center, in Spring Hill, Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	CP¶		ADF¶		NDF¶	
		Apr	May	Apr	May	Apr	May
Driller	Radish						
Bates RS4	Cereal Rye	11.2 H	6.9 J	29.7 A	37.1 ABCD	54.3 A	69.2 A
Yankee	Cereal Rye	15.2 FG	8.3 IJ	18.3 FG	31.9 E	41.4 CD	63.2 ABC
TN1902	Wheat	14.7 G	7.3 J	18.5 FG	34.4 BCDE	37.8 D	65.0 AB
FIXatioN	Clover, Balansa	22.0 BCD	23.5 AB	17.6 FGH	18.1 IJ	22.1 GHI	21.7 KL
Balady	Clover, Berseem		17.5 DEF		28.0 EFGH		33.2 GHIJ
Frosty	Clover, Berseem	22.2 BCD	21.1 BCD	17.6 FGH	26.5 FGH	23.7 FGHI	33.5 HIJ
Dixie	Clover, Crimson	23.9 BC	17.1 EF	15.9 H	30.7 EFG	20.4 I	36.0 GH
Kentucky Pride	Clover, Crimson	25.4 AB	20.0 CD	16.1 GH	25.9 GH	20.4 HI	31.7 HIJ
eNhance	Clover, Persian		22.3 ABC		16.5 J		18.7 L
Dynamite	Clover, Red		24.3 A		22.4 HI		26.5 JKL
Q	Clover, Red	17.2 EFG	22.0 ABC	23.3 CD	23.0 HI	30.5 EF	28.5 IJK
AU Merit	Vetch, Hairy	27.3 A	23.2 AB	19.5 EF	30.5 EFG	25.4 FGH	34.4 HI
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	17.9 F	13.5 GH	26.3 BC	39.3 AB	42.0 BCD	55.3 CD
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	16.0 FG	15.4 EFG	26.2 BC	37.4 ABC	43.5 BC	51.7 DE
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	23.5 BCD	18.3 DE	21.3 DE	32.2 CDE	32.3 E	45.5 EF
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	24.3 B	21.8 ABC	23.4 D	30.8 EF	31.7 E	38.9 FGH
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	14.9 G	11.1 H	26.2 BC	41.6 A	45.4 BC	60.2 BC
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	15.6 FG	11.0 HI	27.3 AB	39.0 AB	47.2 B	56.6 BCD
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	20.7 DE	15.0 FG	16.7 GH	32.8 CDE	27.3 EFG	45.1 EF
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	21.2 CD	15.8 EFG	18.0 FGH	32.3 DE	26.6 FG	42.6 FG
Summary Statistics							
Average		19.6	16.8	21.3	30.5	33.6	42.9
Standard Error		1.3	1.0	0.9	1.9	5.0	2.9
Min		11.2	6.9	15.9	16.5	20.4	18.7
Max		27.3	24.3	29.7	41.6	54.3	69.2
Range		16.1	17.3	13.8	25.1	33.8	50.5
ANOVA p-values							
- Variety		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
- Location							
- Variety x Location							

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

¶ Analyzed using near infrared spectroscopy (NIRS) with the appropraite calibration for each species. Reported on a 100% DM basis.

Table 27-b. By location mean forage quality of 16 cover crop varieties and 8 mixes planted in early Nov. 2021, in small plot replicated trials, at at the Middle Tennessee AgResearch and Education Center, in Spring Hill, Tennessee, and evaluated from Fall 2021 to Spring 2022.

Variety	Common Name	Ash¶		Fat¶		Lignin¶	
		Apr	May	Apr	May	Apr†	May
Driller	Radish						
Bates RS4	Cereal Rye	2.7 G	0.3 M	2.5 E	1.9 GH	3.4 DEF	4.8 DEF
Yankee	Cereal Rye	2.9 FG	2.0 KL	3.5 A	2.5 ABC	2.6 GH	3.8 GH
TN1902	Wheat	4.0 DEFG	0.6 LM	3.1 B	1.9 EFGH	2.0 I	4.3 EFGH
FIXatioN	Clover, Balansa	10.7 A	10.2 AB	2.7 CDE	2.6 A	4.1 BCD	3.2 HI
Balady	Clover, Berseem		7.2 CDEF		2.0 DEFGH		5.8 ABCDE
Frosty	Clover, Berseem	6.0 BC	8.6 BC	2.5 E	2.6 AB	3.1 EFG	4.6 DEFG
Dixie	Clover, Crimson	5.7 BC	6.6 DEF	2.5 E	1.9 GH	3.3 EF	6.2 AB
Kentucky Pride	Clover, Crimson	5.7 BCD	7.2 DE	2.6 DE	2.2 CDEF	3.7 CDE	5.0 DEF
eNhance	Clover, Persian		11.0 A		2.5 ABCD		2.4 I
Dynamite	Clover, Red		7.0 DE		2.7 A		4.2 FGH
Q	Clover, Red	6.8 B	8.0 CD	2.5 DE	2.6 AB	5.3 A	4.0 FGH
AU Merit	Vetch, Hairy	4.9 BCDE	6.6 DEF	2.6 DE	2.4 ABCD	4.5 AB	6.4 A
1. Bates RS4 (10%) + AU Merit (90%)	Cereal Rye + Hairy Vetch	3.9 EFG	4.6 GHIJ	2.5 E	1.9 FGH	3.3 DEF	6.1 ABC
2. Bates RS4 (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	4.2 CDEF	4.8 GHIJ	2.5 E	2.1 EFG	3.3 EF	6.3 AB
3. Yankee (20%) + AU Merit (80%)	Cereal Rye + Hairy Vetch	4.5 BCDE	5.3 FGH	2.9 BC	2.4 ABCD	3.4 DEF	5.0 CDEF
4. TN1902 (20%) + AU Merit (80%)	Wheat + Hairy Vetch	5.7 BC	6.0 EFG	2.6 DE	2.3 BCDE	4.2 BC	5.5 ABCD
5. Bates RS4 (10%) + Dixie (90%)	Cereal Rye + Crimson Clover	3.7 EFG	3.4 IJK	2.6 E	1.6 H	2.9 FGH	6.3 AB
6. Bates RS4 (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	3.2 EFG	5.0 FGHI	2.6 E	1.8 GH	3.0 FGH	6.1 ABC
7. Yankee (20%) + Dixie (80%)	Cereal Rye + Crimson Clover	5.0 BCDE	4.1 HIJ	3.0 B	2.1 EFG	2.4 HI	5.3 BCDE
8. TN1902 (20%) + Dixie (80%)	Wheat + Crimson Clover	5.7 BC	3.4 JK	2.8 CD	1.8 GH	3.2 EF	5.6 ABCD
Summary Statistics							
Average		5.0	5.6	2.7	2.2	3.4	5.0
Standard Error		0.7	0.6	0.1	0.1	0.2	0.4
Min		2.7	0.3	2.5	1.6	2.0	2.4
Max		10.7	11.0	3.5	2.7	5.3	6.4
Range		8.0	10.8	1.0	1.1	3.3	3.9
ANOVA p-values							
- Variety		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
- Location							
- Variety x Location							

† Varieties that have any MS letter in common are not significantly different (Fisher's Protected LSD, P<0.05). Mean separation letters are highlighted in dark orange for values that are not statistically different from the highest value across all entries within a given trait. Mean values between the 50th and 75th percentile are highlighted in light orange, mean values above the 75th percentile are highlighted in dark orange.

¶ Analyzed using near infrared spectroscopy (NIRS) with the appropraite calibration for each species. Reported on a 100% DM basis.

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