

MISSISSIPPI COVER CROP

VARIETY TRIALS, 2021

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MISSISSIPPI'S OFFICIAL VARIETY TRIALS



MISSISSIPPI STATE UNIVERSITY™
MS AGRICULTURAL AND
FORESTRY EXPERIMENT STATION

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This report contains data generated as part of the Mississippi Agricultural and Forestry Experiment Station research program. Joint sponsorship by the organizations listed on pages 11 is gratefully acknowledged.

Trade names of commercial products used in this report are included only for clarity and understanding. All available names (i.e., trade names, code numbers, chemical names, etc.) of varieties or products used in this research project are listed on pages 11.

Mississippi Cover Crop Variety Trials, 2021

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Recognition is given to student worker Joey Hester for his assistance in cultivating, packing, planting, harvesting, and recording plot data.

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Find variety trial information online at mafes.msstate.edu/variety-trials.

Mississippi Cover Crop Variety Trials, 2021

INTRODUCTION

Many seed companies and retailers that specialize in forage crops have expanded some of their products to act as cover crops. Cover crops are typically planted before a grain crop for several reasons. Cover crops can provide and stabilize N for the subsequent crop and add organic matter to the soil or increase weed suppression during the off season. Cover crops can also add root

structure and ground cover to hold soil in place during rainfall, increasing the overall quality of the soil for the following crop. While legumes are valued for their ability to add nitrogen to the soil through fixation, grass crops can have an allelopathic effect towards invasive weed species.

PROTOCOL

Varieties of several cover-crop species were evaluated during 2020-2021 at the Mississippi Agricultural and Forestry Experiment Station's (MAFES) small-plot trials. Entries were submitted by seed companies as well as breeding programs at state universities. All entries from privately owned companies are tested on a fee basis. Selected varieties that are publicly or commercially available may have been added by MAFES Forage Variety Testing program as a reference check for comparison purposes. In addition, varieties of interest to the region may also be added when applicable. Testing during 2020-2021 was conducted at the following locations: Leveck Animal Research Center at the Mississippi State campus, Coastal Plain Branch Experiment Station at Newton, and Black Belt Branch Experiment Station at Brooksville.

The cover crop trial was planted at all locations in October 2020. Plots were 6 feet by 10 feet and planted using a precision-cone seeder on a prepared seedbed. The trial was designed as a strip plot replicated three times with harvest/termination date representing a single strip. Recommended seeding rates used are presented in Table 1. Individual strips were harvested March 15, April 1, and April 15 to best represent cover

Table 1. Recommended seeding rates for cover crops.

Type/Species	Rate (lb/A)
Small Grains	
Cereal Rye	100
Legumes	
Hairy Vetch	25
Berseem Clover	20
Balansa Clover	4
Ball Clover	3
Crimson Clover	30
Persian Clover	8
Winter Pea	40
Red Clover	10
Brassica	
Rape	4
Radish	4
Turnip	4

crop incorporation before typical commodity crop production (corn, cotton, soybeans) in Mississippi.

All plots were harvested to a 3-inch stubble height. Plots were harvested using a Winterstieger Cibus F plot harvester equipped with a reel-type header that collected a

4.8-foot-by-10-foot swath to calculate total yield. A subsample was collected and dried at 130°F until constant weight was achieved to calculate dry matter (DM) concentration. Forage quality was estimated using NIR (Foss 2500, Foss North America, Eden Prairie, Minnesota) and the 2018 mixed hay equation of the NIRS Forage and Feed Testing Consortium (Madison, Wisconsin). Data were used to populate a “Nitrogen Availability Calculator” Model (<http://aesl.ces.uga.edu/mineralization/>) developed by the University of Georgia College of Agriculture and Environmental Sciences (Athens, Georgia) to report estimated N availability after 2 weeks, 4 weeks, and 12 weeks after termination. Economics data were calculated using local (Mississippi) retail cost of seed from two sources per variety with that cost added to a fixed planting cost of \$13

per acre (Falconer et al., 2016). Nitrogen value was presented as a national average value, and data were analyzed using the General Linear Model (PROC GLM) of SAS. Mean separation was conducted using LSD at $\alpha = 0.05$.

Data presented in Tables 2–16 can be used to evaluate the performance of each forage crop within its respective trial. Mean and harvest comparisons were evaluated statistically by using the least significant difference (LSD) test at the probability level of $\alpha = 0.05$. The LSD value represents the minimum amount of yield that must be observed between any two varieties to determine if the difference was due to variety variation alone. Sources of seed are presented in Table 17.

STARKVILLE RESULTS

In Starkville the greatest mean dry matter (DM) was observed when termination was delayed until April 15 (Table 2–3). March 15 proved to be too early for adequate growth to be achieved in all but the cereal rye plots. Total N availability was the greatest in berseem clover, red clover, and winter pea by April 1 with a slight

decrease when termination was delayed until April 15 (Tables 4–5). Despite the increase in total N for clover entries, mean available N for all entries was similar by the 3-month time period for the April 1 and April 15 harvests.

Table 2. Dry matter yields of cover crop varieties at three termination dates in Starkville.

Variety	Species	March 15 termination	April 1 termination	April 15 termination
		<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>
Bates RS4	Rye	2040	4841	3609
Elbon	Rye	656	3453	3771
NF95319b	Rye	2028	4601	2566
NF97325	Rye	1623	4563	3178
NF99362	Rye	—	5954	4510
Vivant	Turnip	13	1460	2158
Jackpot	Turnip	99	1699	1632
Aerifi	Radish	—	447	1297
Fixation	Balansa C.	—	774	2050
Frosty	Berseem C.	420	3178	4097
Go-Per-12	Persian C.	—	853	2651
Driller	Radish	—	568	716
Survivor	Winter Pea	136	2744	2895
Dynamite	Red C.	—	2183	2524
Q	Red C.	—	2426	3425
Purple Top	Turnip	44	2406	3790
Essex Rape	Rape	183	1121	1780
Mean		453	2545	2744
LSD (0.05)		370	963	2294
CV		40	22	42
Planted: 10/8/20				
Soil: Marietta Fine Sandy Loam				

Table 3. Dry matter yield for cover crop species at three termination dates in Starkville.

Species	Termination Date		
	March 15 termination	April 1 termination	April 15 termination
	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>
Balansa C.	—	774	2050
Berseem C.	420	3178	4097
Persian C.	—	852	2650
Radish	—	507	1679
Rape	275	1682	3234
Red C.	—	2305	2847
Rye	1583	4691	3618
Turnip	663	1855	2843
Winter Pea	—	2744	2895
Mean	735	2227	2983
LSD (0.05)	1205	1031	2134
CV	40	21	40

Planted: 10/8/20
Soil: Marietta Fine Sandy Loam

Table 4. Estimated nitrogen availability of cover crop varieties at 2 weeks, 4 weeks, and 12 weeks after three termination dates in Starkville.

Variety	Species	March 15 termination				April 1 termination				April 15 termination			
		2 Wk.	4 Wk.	12 Wk.	Total N	2 Wk.	4 Wk.	12 Wk.	Total N	2 Wk.	4 Wk.	12 Wk.	Total N
		<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>
Bates RS4	Rye	5	8	13	26	0	0	4	4	-1	-2	-2	-5
Elbon	Rye	3	5	7	15	2	5	10	18	2	3	7	11
NF95319B	Rye	5	8	13	25	2	4	10	16	7	10	15	32
NF97325	Rye	6	10	16	31	1	2	6	8	8	12	17	38
NF99362	Rye	6	11	16	33	1	2	7	9	2	4	6	13
Vivant	Turnip	7	12	17	35	8	12	16	36	7	12	15	35
Jackpot	Turnip	1	2	3	6	9	15	19	43	20	28	35	83
Aerifi	Radish	—	—	—	—	3	5	6	14	5	7	9	21
Fixation	Balansa C.	—	—	—	—	5	8	10	22	14	20	25	59
Frosty	Berseem C.	4	6	9	19	28	42	55	124	26	40	51	117
GO-PER-12	Persian C.	—	—	—	—	8	12	16	37	10	15	20	45
Driller	Radish	—	—	—	—	4	6	7	17	7	11	15	32
Survivor	Winter Pea	—	—	—	—	30	46	60	136	25	38	47	110
Dynamite	Red C.	—	—	—	—	21	31	41	93	15	23	30	68
Q	Red C.	—	—	—	—	24	36	47	107	31	46	57	133
Purple Top	Turnip	4	7	10	20	14	21	28	63	16	25	32	73
Essex Rape	Rape	2	3	4	9	8	13	17	38	13	21	28	62
Mean		4	7	11	22	10	15	21	46	12	18	24	54
LSD (0.05)		7	11	17	35	7	10	13	30	15	22	27	65
CV		42	42	35	36	37	37	36	37	42	36	35	38

Planted: 10/8/20
Soil: Marietta Fine Sandy Loam

Table 5. Estimated nitrogen availability of cover crop species at three termination dates in Starkville.

Species	March 15 termination				April 1 termination				April 15 termination			
	2 Wk.	4 Wk.	12 Wk.	Total N	2 Wk.	4 Wk.	12 Wk.	Total N	2 Wk.	4 Wk.	12 Wk.	Total N
	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>
Balansa C.	—	—	—	—	5	8	10	22	14	20	25	59
Berseem C.	4	6	9	19	28	42	55	124	26	40	51	117
Persian C.	—	—	—	—	8	12	16	37	10	15	20	45
Radish	—	—	—	—	4	5	7	16	6	9	12	27
Rape	2	3	4	9	8	13	17	38	13	21	28	62
Red C.	—	—	—	—	22	34	44	100	22	32	40	94
Rye	5	8	13	26	1	3	7	11	4	6	9	18
Turnip	4	7	10	20	10	16	21	47	14	21	27	61
Winter Pea	—	—	—	—	30	46	60	136	25	38	47	110
Mean	4	6	9	19	14	21	28	64	15	23	29	67
LSD (0.05)	5	9	13	26	5	8	11	25	13	18	23	53
CV	42	42	35	36	37	37	36	37	42	36	35	38

Planted: 10/8/20
Soil: Marietta Fine Sandy Loam

Table 6. Economic value of cover crop nitrogen in Starkville.

Variety	Species	March 15 termination			April 1 termination			April 15 termination		
		Total N	Cost ¹	Market value ²	Total N	Cost	Market value	Total N	Cost	Market value
		<i>lb/A</i>	<i>\$/A</i>	<i>\$</i>	<i>lb/A</i>	<i>\$/A</i>	<i>\$</i>	<i>lb/A</i>	<i>\$/A</i>	<i>\$</i>
Bates RS4	Rye	38.0	38.0	23.9	11.0	38.0	6.9	-2.0	38.0	-1.3
Elbon	Rye	38.0	38.0	23.9	54.0	38.0	34.0	10.0	38.0	6.3
NF95319b	Rye	38.0	38.0	23.9	27.0	38.0	17.0	29.0	38.0	18.3
NF97325	Rye	38.0	38.0	23.9	156.0	38.0	98.3	30.0	38.0	18.9
NF99362	Rye	38.0	38.0	23.9	54.0	38.0	34.0	4.0	38.0	2.5
Vivant	Turnip	21.0	8.0	13.2	34.0	8.0	21.4	91.5	8.0	57.6
Jackpot	Turnip	21.0	8.0	13.2	33.0	8.0	20.8	70.3	8.0	44.3
Aerifi	Radish	21.0	8.0	13.2	10.0	8.0	6.3	13.5	8.0	8.5
Fixation	Balansa C.	11.0	11.0	6.9	97.7	11.0	61.5	126.0	11.0	79.4
Frosty	Berseem C.	38.0	38.0	23.9	117.7	38.0	74.1	119.0	38.0	75.0
Go-Per-12	Persian C.	—	—	—	80.0	—	50.4	149.7	—	94.3
Driller	Radish	21.3	8.0	13.4	12.0	8.0	7.6	11.0	8.0	6.9
Survivor	Winter Pea	35.0	35.0	22.1	67.0	35.0	42.2	117.0	35.0	73.7
Dynamite	Red C.	25.0	25.0	15.8	78.0	25.0	49.1	135.3	25.0	85.3
Q	Red C.	25.0	25.0	15.8	62.0	25.0	39.1	170.3	25.0	107.3
Purple Top	Turnip	21.0	7.0	13.2	72.0	7.0	45.4	82.5	7.0	52.0
Essex Rape	Rape	10.4	10.4	6.5	34.0	10.4	21.4	32.3	10.4	20.4

¹Cost: average seed prices plus \$13 per acre for planting cost.

²Market value assumes fertilizer cost at \$0.63 per pound of N.

BROOKSVILLE RESULTS

In Brooksville, turnip, radish, and rape did poorly, producing little to no biomass for harvest. The greatest mean yields were observed when termination was delayed until April 15 (Tables 7–8). Rye produced the greatest DM yield at the March 15 and April 1 termina-

tion dates, while berseem clover produced the greatest by April 15. Berseem clover provided the greatest available total N for the April 1 and April 15 termination dates (Tables 9–10).

Table 7. Dry matter yields of cover crop varieties at three termination dates in Brooksville.

Variety	Species	March 15 termination	April 1 termination	April 15 termination
		<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>
Bates RS4	Rye	1012	4167	4464
Elbon	Rye	576	3771	3643
NF95319b	Rye	1117	4013	4015
NF97325	Rye	1073	2355	3649
NF99362	Rye	1919	2961	3362
Vivant	Turnip	—	365	763
Jackpot	Turnip	—	—	—
Aerifi	Radish	—	—	—
Fixation	Balansa C.	—	693	239
Frosty	Berseem C.	613	2578	4064
Go-Per-12	Persian C.	95	386	1394
Driller	Radish	—	—	—
Survivor	Winter Pea	90	765	833
Dynamite	Red C.	118	959	1521
Q	Red C.	—	824	1190
Purple Top	Turnip	—	—	—
Essex Rape	Rape	77	—	—
Mean		393	1402	1714
LSD (0.05)		218	974	1308
CV		38	39	41
Planted: 10/16/20				
Soil: Silty Clay				

Table 8. Dry matter yield for cover crop species at three termination dates in Brooksville.

Species	Termination Date		
	March 15 termination	April 1 termination	April 15 termination
	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>
Balansa C.	—	2079	359
Berseem C.	613	2578	4064
Persian C.	136	386	1395
Radish	—	—	—
Rape	—	—	—
Red C.	122	892	1627
Rye	1249	3266	3827
Turnip	—	1095	2289
Winter Pea	270	765	1249
Mean	478	1497	2408
LSD (0.05)	1002	1665	1395
CV	38	39	41

Planted: 10/16/20
Soil: Silty Clay

Table 9. Estimated nitrogen availability of cover crop varieties at 2 weeks, 4 weeks, and 12 weeks after three termination dates in Brooksville.

Variety	Species	March 15 termination				April 1 termination				April 15 termination			
		2 Wk.	4 Wk.	12 Wk.	Total N	2 Wk.	4 Wk.	12 Wk.	Total N	2 Wk.	4 Wk.	12 Wk.	Total N
		<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>
Bates RS4	Rye	3	5	8	17	0	1	3	4	0	0	2	2
Elbon	Rye	3	5	8	17	1	2	6	9	-1	-1	0	-1
NF95319b	Rye	2	4	6	13	1	2	5	8	-1	-1	1	-1
NF97325	Rye	3	4	7	14	0	0	1	1	0	1	3	3
NF99362	Rye	5	9	14	28	0	0	1	0	0	1	3	4
Vivant	Turnip	—	—	—	—	5	7	10	22	6	10	14	30
Jackpot	Turnip	—	—	—	—	—	—	—	—	—	—	—	—
Aerifi	Radish	—	—	—	—	—	—	—	—	—	—	—	—
Fixation	Balansa C.	—	—	—	—	21	32	41	94	3	4	5	11
Frosty	Berseem C.	5	8	11	23	21	31	40	91	29	43	53	125
Go-Per-12	Persian C.	1	2	3	6	3	5	7	16	14	20	25	59
Driller	Radish	—	—	—	—	—	—	—	—	—	—	—	—
Survivor	Winter Pea	3	5	7	15	6	9	12	26	10	15	18	43
Dynamite	Red C.	2	3	4	9	10	15	20	45	12	18	22	53
Q	Red C.	0	0	0	1	6	10	13	30	16	24	30	70
Purple Top	Turnip	—	—	—	—	—	—	—	—	—	—	—	—
Essex Rape	Rape	—	—	—	—	—	—	—	—	—	—	—	—
Mean		3	5	7	14	6	9	13	29	7	11	15	33
LSD (0.05)		4	6	9	19	8	13	16	36	5	8	10	23
CV		42	42	41	42	42	43	44	41	34	33	35	36

Planted: 10/16/20
Soil: Silty Clay

Table 10. Estimated nitrogen availability of cover crop species at three termination dates in Brooksville.

Species	March 15 termination				April 1 termination				April 15 termination			
	2 Wk.	4 Wk.	12 Wk.	Total N	2 Wk.	4 Wk.	12 Wk.	Total N	2 Wk.	4 Wk.	12 Wk.	Total N
	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>
Balansa C.	—	—	—	—	21	32	41	94	3	4	5	11
Berseem C.	5	8	11	23	21	31	40	91	29	43	53	125
Persian C.	1	2	3	6	3	5	7	16	14	20	25	59
Radish	—	—	—	—	—	—	—	—	—	—	—	—
Rape	—	—	—	—	—	—	—	—	—	—	—	—
Red C.	1	2	3	6	8	12	17	37	15	22	27	64
Rye	3	6	9	18	0	1	3	4	0	0	2	2
Turnip	—	—	—	—	5	7	10	22	6	10	14	30
Winter Pea	3	5	7	15	6	9	12	26	10	15	18	43
Mean	3	4	6	14	7	11	15	33	12	18	23	54
LSD (0.05)	3	6	9	18	7	11	15	34	4	7	9	20
CV	42	42	41	42	42	43	44	41	34	33	35	36

Planted: 10/16/20
Soil: Silty Clay

Table 11. Economic value of cover crop nitrogen at Brooksville.

Variety	Species	March 15 termination			April 1 termination			April 15 termination		
		Total N	Cost ¹	Market value ²	Total N	Cost	Market value	Total N	Cost	Market value
		<i>lb/A</i>	<i>\$/A</i>	<i>\$</i>	<i>lb/A</i>	<i>\$/A</i>	<i>\$</i>	<i>lb/A</i>	<i>\$/A</i>	<i>\$</i>
Bates RS4	Rye	16.7	38.0	10.5	4.3	38.0	2.7	2.3	38.0	1.5
Elbon	Rye	16.7	38.0	10.5	9.0	38.0	5.7	-0.7	38.0	-0.4
NF95319b	Rye	13.0	38.0	8.2	7.7	38.0	4.8	-1.0	38.0	-0.6
NF97325	Rye	14.0	38.0	8.8	1.3	38.0	0.8	3.0	38.0	1.9
NF99362	Rye	27.7	38.0	17.4	0.0	38.0	0.0	4.3	38.0	2.7
Vivant	Turnip	—	21.0	—	22.0	21.0	13.9	30.0	21.0	18.9
Jackpot	Turnip	—	21.0	—	—	21.0	—	—	21.0	—
Aerifi	Radish	—	21.0	—	—	21.0	—	—	21.0	—
Fixation	Balansa C.	—	11.0	—	94.0	11.0	59.2	11.0	11.0	6.9
Frosty	Berseem C.	23.0	38.0	14.5	91.0	38.0	57.3	124.7	38.0	78.5
Go-Per-12	Persian C.	6.0	—	3.8	16.0	—	10.1	59.0	—	37.2
Driller	Radish	—	21.3	—	—	21.3	—	—	21.3	—
Survivor	Winter Pea	15.0	35.0	9.5	26.0	35.0	16.4	42.5	35.0	26.8
Dynamite	Red C.	9.0	25.0	5.7	44.7	25.0	28.1	53.0	25.0	33.4
Q	Red C.	1.0	25.0	0.6	29.7	25.0	18.7	69.5	25.0	43.8
Purple Top	Turnip	—	21.0	—	—	21.0	—	—	21.0	—
Essex Rape	Rape	—	10.4	—	—	10.4	—	—	10.4	—

¹Cost: average seed prices plus \$13 per acre for planting cost.

²Market value assumes fertilizer cost at \$0.63 per pound of N.

NEWTON RESULTS

At the Newton location, DM yields were the greatest when termination was delayed until April 15. Radish varieties generally did poorly regardless of termination date, while turnip, winter pea, and berseem clover produced more than 1,000 pounds per acre by the March 15 termination date (Tables 12–13). Berseem,

Persian, and red clover were among the greatest producers of DM yield by April 15. Total available N was the greatest in ‘Vivant’ turnip by March 15; however, by the April 15 termination date, balansa, berseem, Persian, ‘Q’ red clover, and winter pea produced more than 115 pounds per acre of total N (Table 14–15).

Table 12. Dry matter yields of cover crop varieties at three termination dates in Newton.

Variety	Species	March 15 termination	April 1 termination	April 15 termination
		<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>
Vivant	Turnip	1846	1478	2456
Jackpot	Turnip	404	938	2046
Aerifi	Radish	256	256	389
Fixation	Balansa C.	981	2170	2711
Frosty	Berseem C.	1222	2950	3736
Go-Per-12	Persian C.	563	1357	3112
Driller	Radish	115	130	315
Survivor	Winter Pea	1084	1457	2557
Dynamite	Red C.	656	1696	3194
Q	Red C.	749	1573	3930
Purple Top	Turnip	955	1406	2886
Essex Rape	Rape	419	948	1646
Mean		771	1363	2415
LSD (0.05)		585	943	1587
CV		40	39	38
Planted: 10/7/20				
Soil: Prentiss Sandy Loam				
Cereal rye was not planted at Newton due to lack of seed to plant all replications.				

Table 13. Dry matter yield for cover crop species at three termination dates in Newton.

Species	Termination Date		
	March 15 termination	April 1 termination	April 15 termination
	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>
Balansa C.	—	2170	2711
Berseem C.	1222	2949	3736
Persian C.	—	1354	3112
Radish	384	261	327
Rape	711	844	1646
Red C.	684	1647	2987
Turnip	3006	1148	2378
Winter Pea	1083	1456	2557
Mean	1339	1613	2519
LSD (0.05)	1723	847	1470
CV	40	37	38

Planted: 10/7/20
 Soil: Prentiss Sandy Loam
 Cereal rye was not planted at Newton due to lack of seed to plant all replications.

Table 14. Estimated nitrogen availability of cover crop varieties at 2 weeks, 4 weeks, and 12 weeks after three termination dates in Newton.

Variety	Species	March 15 termination				April 1 termination				April 15 termination			
		2 Wk.	4 Wk.	12 Wk.	Total N	2 Wk.	4 Wk.	12 Wk.	Total N	2 Wk.	4 Wk.	12 Wk.	Total N
		<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>
Vivant	Turnip	19	31	44	93	8	11	15	34	22	32	39	92
Jackpot	Turnip	—	—	—	—	8	11	15	33	16	24	30	70
Aerifi	Radish	3	5	7	14	2	3	5	10	3	5	6	14
Fixation	Balansa C.	—	—	—	—	22	33	43	98	30	43	53	126
Frosty	Berseem C.	11	17	25	53	26	39	52	118	28	41	50	119
Go-Per-12	Persian C.	—	—	—	—	18	27	36	80	35	51	63	150
Driller	Radish	—	—	—	—	3	4	5	12	3	4	5	11
Survivor	Winter Pea	8	13	19	41	15	23	30	67	27	40	50	117
Dynamite	Red C.	6	10	14	30	17	26	35	78	32	46	57	135
Q	Red C.	6	9	13	27	14	21	28	62	40	58	73	170
Purple Top	Turnip	—	—	—	—	16	24	32	72	19	29	36	83
Essex Rape	Rape	9	14	20	43	8	12	15	34	7	11	14	32
Mean		8	14	20	43	13	20	26	59	16	24	30	70
LSD (0.05)		9	17	23	51	14	20	27	62	21	31	38	90
CV		36	39	37	38	42	41	41	42	43	41	43	41

Planted: 10/7/20
 Soil: Prentiss Sandy Loam

Table 15. Estimated nitrogen availability of cover crop species at three termination dates in Newton.

Species	March 15 termination				April 1 termination				April 15 termination			
	2 Wk.	4 Wk.	12 Wk.	Total N	2 Wk.	4 Wk.	12 Wk.	Total N	2 Wk.	4 Wk.	12 Wk.	Total N
	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>
Balansa C.	—	—	—	—	22	33	43	98	30	43	53	126
Berseem C.	11	17	25	53	26	39	52	118	28	41	50	119
Persian C.	—	—	—	—	18	27	36	80	35	51	63	150
Radish	3	5	7	14	2	4	5	11	3	4	5	12
Rape	9	14	20	43	8	12	15	34	7	11	14	32
Red C.	6	9	13	29	16	24	32	72	30	44	54	128
Turnip	19	31	44	93	11	17	22	50	19	27	34	80
Winter Pea	8	13	19	41	15	23	30	67	27	40	50	117
Mean	9	15	21	45	14	21	27	61	19	28	35	82
LSD (0.05)	9	16	23	48	12	18	23	53	13	19	23	54
CV	36	39	37	38	42	41	41	42	43	41	43	41

Planted: 10/7/20
Soil: Prentiss Sandy Loam

Table 16. Economic value of cover crop nitrogen at Newton.

Variety	Species	March 15 termination			April 1 termination			April 15 termination		
		Total N	Cost ¹	Market value ²	Total N	Cost	Market value	Total N	Cost	Market value
		<i>lb/A</i>	<i>\$/A</i>	<i>\$</i>	<i>lb/A</i>	<i>\$/A</i>	<i>\$</i>	<i>lb/A</i>	<i>\$/A</i>	<i>\$</i>
Vivant	Turnip	93.0	8.0	58.6	34.0	8.0	21.4	91.5	8.0	57.6
Jackpot	Turnip	—	8.0	—	33.0	8.0	20.8	70.3	8.0	44.3
Aerifi	Radish	14.0	8.0	8.8	10.0	8.0	6.3	13.5	8.0	8.5
Fixation	Balansa C.	—	11.0	0.0	97.7	11.0	61.5	126.0	11.0	79.4
Frosty	Berseem C.	53.3	38.0	33.6	117.7	38.0	74.1	119.0	38.0	75.0
Go-Per-12	Persian C.	—	—	—	80.0	—	50.4	149.7	—	94.3
Driller	Radish	—	8.0	—	12.0	8.0	7.6	11.0	8.0	6.9
Survivor	Winter Pea	40.7	35.0	25.6	67.0	35.0	42.2	117.0	35.0	73.7
Dynamite	Red C.	30.0	25.0	18.9	78.0	25.0	49.1	135.3	25.0	85.3
Q	Red C.	27.0	25.0	17.0	62.0	25.0	39.1	170.3	25.0	107.3
Purple Top	Turnip	—	7.0	—	72.0	7.0	45.4	82.5	7.0	52.0
Essex Rape	Rape	43.0	10.4	27.1	34.0	10.4	21.4	32.3	10.4	20.4

¹Cost: average seed prices plus \$13 per acre for planting cost.

²Market value assumes fertilizer cost at \$0.63 per pound of N.

Table 17. Seed sources for the 2020-2021 Cover Crop Variety Testing Program.

Variety	Seed company/source
Bates RS4	Noble Foundation
Elbon	Noble Foundation
NF95319B	Noble Foundation
NF97325	Noble Foundation
NF99362	Noble Foundation
Vivant	MTV
Jackpot	MTV
Aerifi	MTV
Fixation	Grassland Oregon
Frosty	Grassland Oregon
GO-PER-12	Grassland Oregon
Driller	Grassland Oregon
Survivor	Grassland Oregon
Dynamite	Grassland Oregon
Q	Grassland Oregon

REFERENCE

Falconer, L., J. M. Riley, and B. Williams. 2016. *Custom Rates for Farm and Ranch Services in Mississippi*. MSU Extension Service. Publication 2776.



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