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Jamie L. Whitten Plant Materials Center

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Plant Materials Technical Note No. 114

Crimson Clover (*Trifolium incarnatum* L.): When to plant and terminate in the Mid-South?

Figure 1. 'Dixie' crimson clover planted on October 1, 2022. Picture was taken on April 15, 2023.

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Acknowledgements

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Purpose: The purpose of this paper is to provide recommendations for planting and termination windows for crimson clover (*Trifolium incarnatum* L.) based on a producer's resource concerns in the Mid-South.

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Preface

The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Plant Materials Program has been involved in the evaluation of conservation plants and planting technology for more than 80 years. The purpose of this paper is to provide recommendations for planting and termination windows for crimson clover (*Trifolium incarnatum* L.) based on a producer's resource concerns in the Mid-South.

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

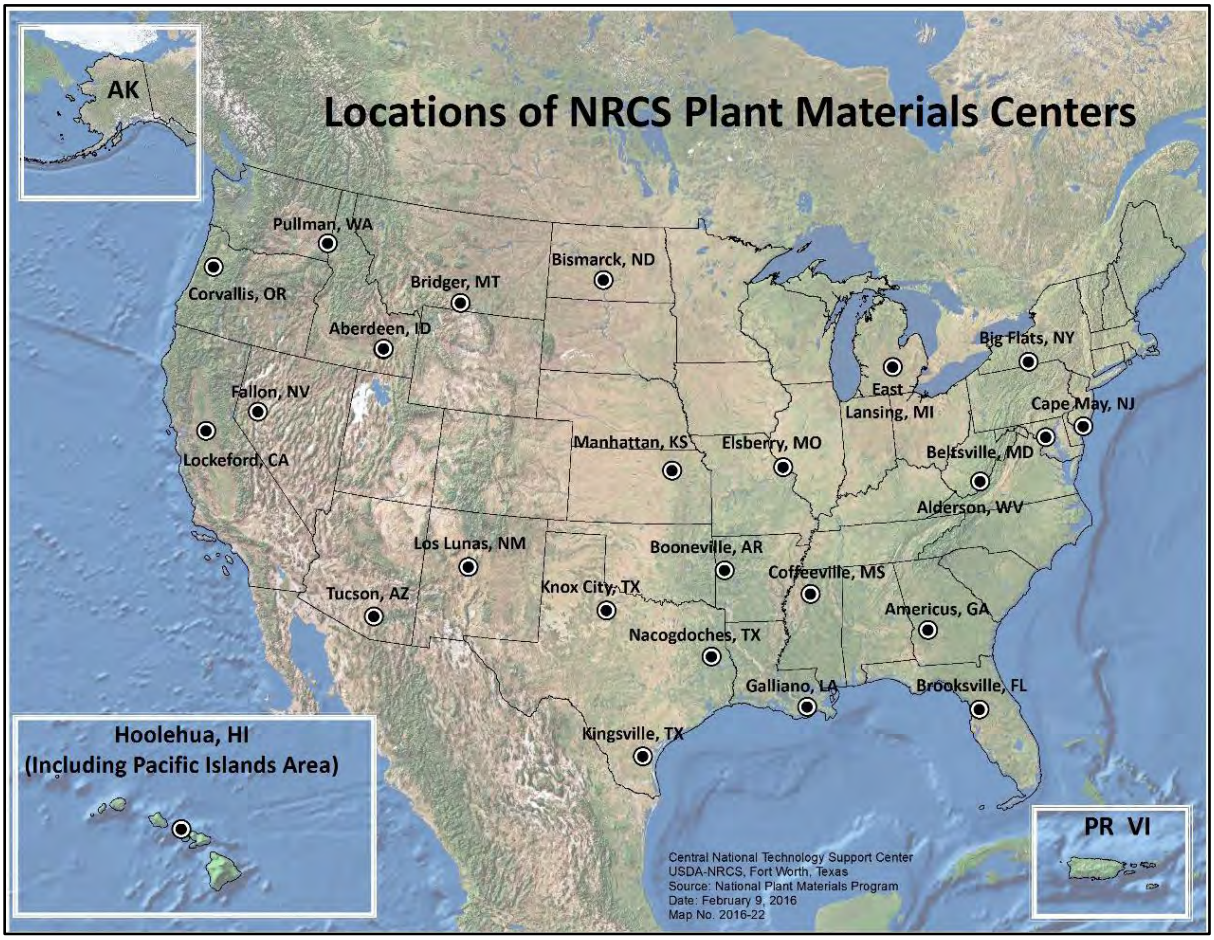

Figure 2. Location Map of NRCS Plant Materials Centers.

Why plant crimson clover?

Crimson clover is a common annual cool season legume used for a cover crop in both monocultures and mixes in the Mid-South. A couple of distinct advantages of crimson clover compared to other cool season legumes include higher dry matter and nitrogen production. For instance, crimson clover can produce 3,500 to 5,500 lb. dry matter/acre and fix 70 to 150 lb. of nitrogen/acre by mid-May in the inland Deep South (Clark, 2007). Nitrogen production is dependent upon multiple management factors such as seeding rate, planting date, and termination date. In a cover crop variety trial conducted by Mississippi State University in 2019, it was found that delaying termination by 2 weeks (from March 15 to April 1) resulted in approximately 20% increase in total N production of aboveground biomass (White Rushing, 2019). These advantages make it a good choice for producers in the Mid-South who struggle with low organic matter and nitrogen production.

What cultivars or varieties of crimson clover are recommended for the Mid-South?

The Jamie L. Whitten plant materials center (PMC) conducted an adaptation trial for crimson clover during the 2017-2018 and 2018-2019 growing seasons (Richard and Allison, 2020). As a result of this study, the cultivars Dixie, AU Sunrise, and Kentucky Pride were found to be well adapted to the growing conditions of the Mid-South. Dixie is the most common named cultivar or variety in the Mid-South in terms of availability with a blooming date around mid-April. AU Sunrise was noted for blooming approximately 2-3 weeks earlier compared to other cultivars, making it a good choice for producers looking for earlier termination dates.

What is the recommended seeding rate for crimson clover?

The seeding rate of crimson clover is dependent upon multiple factors such as seeding dates, planting method, and resource concerns being addressed with the cover crop. Addressing nitrogen depletion and soil cover will require a medium to high seeding rate regardless of planting method. Crop diversity and beneficial habitat can be addressed with a low to medium seeding rate given proper seeding dates. Another factor to consider is seed bed preparation. Conventional fall tillage to prepare seed bed will require lower rate compared to no-till/minimum tillage due to higher seed to soil contact and lower seedling mortality. Earlier planting dates will allow for lower seeding rates compared to later planting dates due to greater vegetative growth experienced in the fall.

Table 1. Recommended seeding rates (lbs/acre) for crimson clover in the Mid-South by planting method at low, medium, and high rates. USDA-NRCS, Coffeeville, MS 2026.

	Seeding rate (lbs/acre)		
Seeding method	Low	Medium	High
Broadcast	15	20	25
Drill	10	15	20

(Source: USDA NRCS, 2022)

When should crimson clover be planted and terminated in the Mid-South?

To maximize the benefits of a crimson clover cover crop, it is recommended that crimson clover be planted between September 15 to October 15. Planting within this window promotes earlier dry matter production resulting from accumulating growing degree day units in the fall compared to November plantings (Table 2). In a recent study at the PMC using 'Dixie' crimson clover, the highest dry matter yields were achieved with an October 1 planting combined with a May 1 termination date in both the 2023 (2,913 lbs/acre) and 2024 seasons (4,579 lbs/acre) (Vollmer et al, 2025). During the 2023 season, November plantings failed to emerge in the spring resulting in a failed planting due to high seedling mortality. Nitrogen yields were higher when crimson clover was planted September 15 to October 15, and termination was

delayed until April 15. The highest nitrogen yields (lbs of N/acre) were achieved with an October 15 planting combined with a May 1 (69 lbs of N/acre) and April 15 (113 lbs of N/acre) for the 2023 and 2024 seasons, respectively (Table 2). In general, earlier planting dates when combined with later termination dates resulted in higher potential nitrogen yields compared to later planting dates (November plantings).

Table. 2 Effect of planting and termination date on dry matter yields (DMY) and nitrogen yields of 'Dixie' crimson clover in 2022-2023 and 2023-2024, USDA-NRCS Coffeeville, MS, 2025.

	Termination Date (2023)									
	DMY (lbs/acre)					Nitrogen Yield (lbs of N/acre)				
Planting Date	March 1	March 15	April 1	April 15	May 1	March 1	March 15	April 1	April 15	May 1
September 15	642 bA	606 bA	913 abA	1204 abA	2407 aA	20 bA	22 bA	30 abA	31 abA	57 aA
October 1	368 bB	403 bA	710 abA	974 abA	2913 aA*	12 bA	16 bA	24 bA	24 bA	69 aA*
October 15	.	93 cB	892 abA	913 abA	2336 aA	.	3 cB	37 bA	35 bA	62 aA
November 1	.	.	.	.	.	.	.	.	.	.
November 15	.	.	.	.	.	.	.	.	.	.
Planting Date	Termination Date (2024)									
September 15	239 cA	1045 bcA	1972 bA	3912 aA	4104 aA	8 dA	38 cdA	68 bcA	107 aA	84 abA
October 1	499 cA	1591 bcA	2261 bA	4397 aA	4579 aA*	19 cA	57 bcA	80 abA	113 aA*	90 abA
October 15	450 bA	1124 bA	1876 bA	3994 aA	3812 aA	15 dA	41 cdA	65 bcA	111 aA	92 abA
November 1	296 cA	981 caA	2311 bA	2724 abA	3716 aA	11 cA	33 bcA	79 abA	75 abA	87 aA
November 15	182 cA	838 bcA	1341 bA	2532 aA	3223 aA	7 cA	31 bcA	49 abA	88 aA	77 aA

*Means within rows for a planting date followed by the same lower-case letters and within columns for a termination date followed by the same upper-case letters are not significantly different at $P<0.05$ using Tukey's LSD pairwise comparison.
(Source: Vollmer et al, 2025)

Phosphorus yields (lbs of P/acre) were significantly higher when crimson clover was planted between September 15 to October 15 and termination was delayed until April 15 (Vollmer et al, 2025). The highest phosphorus yields were achieved with October 1 planting combined with May 1 (9 lbs of P/acre) and April 15 (13 lbs of P/acre) termination during the 2023 and 2024 seasons (Table 3). Crimson clover planting in November tended to yield less phosphorus due to decreased dry matter production resulting in a decreased ability to scavenge for phosphorus. Crimson clover produced significantly higher potassium yields when planted September 15 to October 15 and termination was delayed until April 15. The highest potassium yields were achieved with October 1 planting and May 1 termination in 2023 (60 lbs of K/acre) and October 15 planting and April 15 termination in 2024 (108 lbs of K/acre). It is recommended that crimson clover be planted between September 15 to October 15 and terminated on or after April 15 to maximize phosphorus and potassium yields.

Table. 3 Effect of planting and termination date on phosphorus and potassium yields of 'Dixie' crimson clover in 2022-2023 and 2023-2024, USDA-NRCS Coffeeville, MS, 2025.

	Termination Date (2023)									
	Phosphorus Yield (lbs of P/acre)					Potassium Yield (lbs of K/acre)				
Planting Date	March 1	March 15	April 1	April 15	May 1	March 1	March 15	April 1	April 15	May 1
September 15	2 bA	2 bA	3 bA	4 abA	7 aA	14 bA	17 bA	20 bA	27 bA	46 aA
October 1	1 bA	1 bA	2 bA	3 bA	9 aA*	8 cA	12 bcA	16 bA	18 bA	60 aA*
October 15	.	0 cA	3 bA	3 bA	7 aA	.	1 cB	27 bA	22 bA	52 aA
November 1	.	.	.	.	.	.	.	.	.	.
November 15	.	.	.	.	.	.	.	.	.	.
Planting Date	Termination Date (2024)									
September 15	1 dA	4 cdA	7 bcA	13 aA	10 abA	5 cA	27 bcAB	60 abA	81 aA	68 abA
October 1	2 dA	6 cdA	8 bcA	13 aA*	11 abA	14 bA	48 abA	64 aA	89 aA	71 aA
October 15	2 dA	4 cdA	7 bcA	13 aA	11 abA	12 cA	31 bcA	51 bAB	108 aA*	92 aA
November 1	1 cA	4 bcA	8 abA	9 aA	11 aA	8 cA	26 bcAB	65 abA	67 aA	93 aA
November 15	1 cA	4 bcA	5 bA	9 aA	11 aA	5 dA	21 cdB	41 bcB	63 abA	79 aA

*Means within rows for a planting date followed by the same lower-case letters and within columns for a termination date followed by the same upper-case letters are not significantly different at $P<0.05$ using Tukey's LSD pairwise comparison.
(Source: Vollmer et al, 2025)

Summary

It is important to plant crimson clover between September 15 to October 15 in the mid-south. Delaying planting until November resulted in lower dry matter, nitrogen, phosphorus, and potassium yields compared to earlier plantings. It is recommended to avoid planting crimson clover in November due to the increased risk of a failed stand. Termination via chemical or cultural means should be delayed until April 15 to maximize the benefits of a crimson clover cover crop. Earlier terminations (March 1 to April 1) resulted in decreased dry matter production, nitrogen production, and nutrient scavenging. As a result, it is recommended that crimson clover should be planted between September 15 to October 15 and terminated on or after April 15 in the Mid-South.

References

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