

Cover Crop Corner

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It's time to ditch Dixie

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Plant breeding improvements have given the industry better alternatives to industry standard cover crop varieties

When Dixie Crimson Clover was released in 1953, its trait for hard seeds filled a huge market need for a re-seeding pasture legume. The ability it gave producers to easily add natural nitrogen and protein into pasture quickly made it the industry standard variety – a title it still holds today. However, after decades of no varietal or production oversight, Dixie Crimson Clover, no longer has any trait consistency.

Finding consistent alternatives

To get a better understanding of how the industry standard variety would perform against quality controlled varieties, University of Illinois researcher Nathan Johanning conducted a trial at the Ewing Demonstration Center. Planted in late September and terminated the following May, Dixie Crimson Clover and three alternative clover varieties – Kentucky Pride Crimson Clover, Frosty Berseem Clover and FIXatioN Balansa Clover – were analyzed for winter survival, root depth, weed suppression, biomass, nitrogen fixation and date of full bloom.



In a trial by The University of Illinois at its Ewing Demonstration Center, Dixie Crimson Clover (left) only contributed 14 pounds of nitrogen in biomass per acre in a trial. Kentucky Pride Crimson Clover (right) contributed 187 pounds of nitrogen in biomass per acre.

Figure 1: Ewing Demonstration Center Cover Crop Trial

Variety	Seed Rate lbs/a (planted 9/24/15)	% Winter Survival	Average Rooting Depth (In)	Max Rooting Depth (In)	% Weed Suppression	Date of Full Bloom
FIXatioN Balansa Clover	8	98	24	33	98	05/10/2016
Frosty Berseem Clover	15	95	25	32	97	N/A
Kentucky Pride Crimson Clover	15	94	25	31	88	04/25/16
Dixie Crimson Clover	15	69	18	24	56	04/25/16

Source: University of Illinois - Ewing Demonstration Center



Dixie Crimson Clover's poor performance in the trials by The University of Illinois prove that it is time to retire the industry standard variety, and to start selecting alternatives bred with improved traits.

On average, the three alternative clover varieties had a 39% greater winter survival rate and average rooting depth than the industry standard (see Figure 1). Kentucky Pride Crimson Clover, Frosty Berseem Clover and FIXatioN Balansa Clover also averaged a 67% advantage for weed suppression than Dixie Crimson Clover.

Fall and spring biomass and nitrogen in biomass measurements were taken (see Figure 2). While Dixie Crimson had the second greatest biomass measurement in the fall at 2,291 pounds per acre, it rapidly declined to 911 pounds per acre by the spring. On the contrary, FIXatioN Balansa Clover's 693 pounds of biomass per acre grew to 8,401 pounds per acre by spring

Dixie Crimson's 14 pounds of nitrogen per acre contribution also seemed negligible compared to FIXatioN's 269 pounds of nitrogen per acre.

Figure 2: Biomass Contributions

Variety	Fall Biomass (green; lbs/a)	Spring Biomass (dry; lbs/a)	Nitrogen in Biomass (lbs/a)
FIXatioN Balansa Clover	693	8,401	269
Frosty Berseem Clover	2,777	4,150	52
Kentucky Pride Crimson Clover	1,798	6,093	187
Dixie Crimson Clover	2,291	911	14

Source: University of Illinois - Ewing Demonstration Center



From being established in late September to being destroyed the following May, FIXatioN Balansa Clover contributed 9,094 pounds of biomass per acre, while fixing 269 pounds of nitrogen per acre. Of the four varieties on trial, it also had the greatest max root depth and weed suppression percentage. FIXatioN's performance against Dixie Crimson Clover shows the progress plant breeding has made in the last 65 years.



Frosty Berseem Clover's root length averaged 25 inches while providing nearly 7,000 pounds of biomass per acre during the trial period. With the ability to thrive in temperatures as low as 5 degrees Fahrenheit and zero snow cover, Frosty Berseem Clover gives new options when frost seeding.

Advancements in cover crop varieties

While it should be noted that Dixie Crimson Clover was an achievement in its time, plant breeding advancements give agricultural producers much more powerful and fit for purpose tools. Echoing remarks from North Carolina State University's Dr Chris Reberg-Horton at Grassland Oregon's 2018 Cover Crop Summit, inconsistent corn varieties from the 1950s would never be accepted by the market – and cover crop varieties shouldn't be viewed any differently.

Just like corn variety improvement, a lot of research and investments have gone into developing cover crop varieties with improved trait performance and consistency. And whether you are selecting a legume like crimson clover or an annual ryegrass, making selections based on trait performance is essential to get the most from your crop.

The future of cover crop varieties is here. It's time to ditch Dixie and move forward.



Crimson clover has been an industry favorite for its nitrogen fixing capabilities and contributions to soil health. If crimson clover is a good fit for your system, Kentucky Pride Crimson Clover is a much more advanced variety than the industry standard Dixie Crimson Clover.