

TILLAGE RADISH PLANTING DATA AFFECTS COVER CROP ESTABLISHMENT YIELD, AND WEED SUPPRESSION

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Tillage radishes have been promoted as a cover crop to increase soil aeration, suppress weeds, and increase yields of the subsequent rotational crop. Cover crops can provide several benefits for a farmer such as nutrient immobilization, soil conservation, and additional forage can be produced for cattle in some instances. In addition, the radish grows a tuber that once decayed, leaves holes to aerate the soil. Sufficient time is needed for effective establishment and growth of tillage radishes in the fall before a killing frost. The objective of this research was to determine the effect of radish planting date and nitrogen rate on tillage radish performance and the subsequent impact on corn growth and yields.

Methods

Tillage radishes were no-till planted on several dates in a field that had previously been winter wheat. Radishes were drill seeded in 7.5 inch rows at 8 pounds acre⁻¹ on 1 August 2012, 17 August 2012, 30 August 2012, 12 September 2012, and 28 September 2012. On 5 October 2012, 15, 30, and 60 pounds of ammonium nitrate, were applied to plots across all planting dates. Radish heights were recorded throughout the growing season and biomass samples were collected in November to determine radish top growth. Winter annual weed control was rated in the spring 2013 prior to a burndown herbicide application. Management details are reported in Table 1. Corn yield will be determined to identify if tillage radish planting dates and N fertilizer rates affect the rotational crop.

Results

Tillage radishes

The later radishes were planted, yield decreased. Starting on 1 August total top dry weight was 2,880 lbs/acre, on 17 August it was 2,020 lbs/acre, on 30 August it was 2,110 lbs/acre, on 12 September there was 1,350 lbs/acre, and on 28 September there was 290 lbs/acre. There was no interaction among planting date and nitrogen rates, however, as nitrogen rates increased to 30 lbs/acre, radish yields increased and SPAD meter readings increased indicating greener plants. A 26% dry matter yield increase (when compared to a control of no added nitrogen) was observed when 15 lbs of ammonium nitrate was applied, 33% dry matter yield increase when 30 lbs was applied, and 22% dry matter yield increase when 60 lbs was applied.

Earlier planted radishes had greater weed suppression (Table 3). The earliest planting on 1 August had 80% weed control of henbit and common chickweed, while the latest planting date on 28 September had only 3% control.

Corn response

There was no significant difference in corn heights among treatments (data not presented).

Table 1. Management of corn planted in 2013.

Management information	2013
Planting Date	8 May
Hybrid	DKC 63-87
Population	33,000 seeds/A
Fertilizer	26 April Anhydrous ammonia at 150 lbs N/acre
Pest management	26 April Roundup PowerMax 32oz/A + Sharpen at 2oz/A + MSO at 1% v/v + AMS at 17 lb/100gal 21 May SureStart at 2 pt/A + Roundup PowerMax at 1 qt/A + NIS at 0.25% v/v + 32 UAN at 1 qt/A

Table 2. SPAD meter ratings and radish top yield for nitrogen rate treatments in 2013.

Nitrogen rate lbs/A	Tops	
	SPAD -SPAD units-	Total Dry Weight --lbs/A--
Non-treated	30	1,345
15	31	1,825
30	31	2,015
60	33	1,730
LSD ($P=0.05$)	--- 2 ---	290

Table 3. Radish top forage yield for various radish planting dates in November 2012 and weed control for radish planting date treatments on 25 April 2013.

Radish planting date	Tops		Weed control	
	Total Dry Weight ---lbs/A---	Common chickweed -----%-----	Henbit	
1 Aug. 2012	2,880	80	80	
17 Aug. 2012	2,015	51	52	
30 Aug. 2012	2,115	66	71	
12 Sept. 2012	1,345	30	29	
28 Sept. 2012	290	3	3	
LSD ($P=0.05$)	480	----- 28 -----	----- 23 -----	