

Establishing a Cost-Efficient Seeding Rate for Hairy Vetch as Cover Crop

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Rationale: Hairy vetch is a winter hardy, annual legume, and its ability to fix nitrogen makes it very useful in vegetable crop rotations. Although the inclusion of hairy vetch in a crop rotation could be advantageous to a farmer, the least expensive seed we could find was \$110.00/50 lbs. Due to the high cost of seed we wanted to identify the optimal seeding rate to ensure that farmers would be maximizing on yield and the associated return of nitrogen.

Research Goals: We are currently conducting research on hairy vetch in order to identify the optimal seeding rate for economic benefit in nitrogen contribution, and also to measure the decomposition rate to determine when the contributed nitrogen is likely to become available to subsequent crops.

Treatments: In the fall of 2013 we planted hairy vetch at five different seeding rates (5, 10, 20, 30, and 40 lbs. per acre) on two different dates of planting; September 11, 2013 and September 24, 2013. We collected samples of the vetch this May, and will be analyzing them for yield and nutrient content. After sample collection, the vetch was flail mowed, disced under the soil surface, and corn was planted on June 7, 2014. We collected soil samples from each plot when the corn reached approximately 12 inches, and we analyzed those to find the amount of nitrogen that is available to the corn relative to the amount of vetch that had been planted.

Results: Figure 1 shows vetch yields in 2013 and 2014 from vetch plantings in fall 2012 and 2013. Note the growth that took place between May 6 and May 30 in 2013. This growth contributed greatly to dry matter and to total nitrogen. Yield in early May 2014 was greater than in 2013. Nitrogen comprises about 3% of the dry weight of vetch.

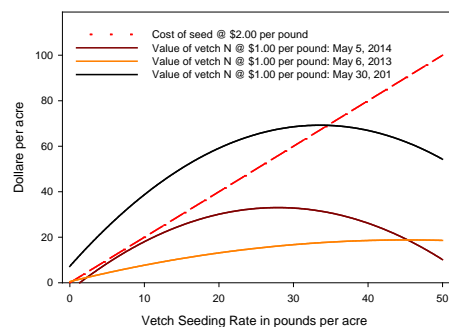
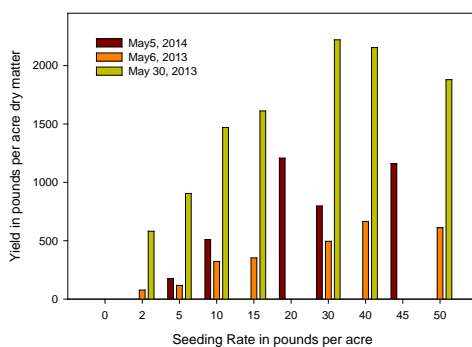


Figure 2 shows the fertilizer dollar value of the nitrogen (valued at \$1.00 per pound N) contributed by the vetch at the harvest times shown, and compares this value to the cost of the vetch seed at \$2.00 per pound used to plant the area. Only where the “value of vetch” line is above the red-dotted “cost of seed” line is there a positive return in nitrogen cost. Our data, therefore, suggest that allowing the vetch extra time for growth is a positive action and the data also suggest that the added expense of planting much more than 30 pounds of vetch removes the positive financial benefit. While we do not have data for late May vetch yield in 2014, the vetch was not flail mowed until the end of May, thus contributing to the “stock” of soil nitrogen. Figure 3 shows that there was significantly more nitrogen available for the corn crop in the plots which had vetch growing prior to corn. If corn side-dress fertilizer recommendation is 150 lb/acre for the “b” group and 125 lb/acre for the “a” group from Figure 3, then vetch cover crop would save \$25.00 an acre in side-dress nitrogen cost, covering up to 12.5 lb of vetch seed. Don’t forget that vetch is also adding to organic matter!

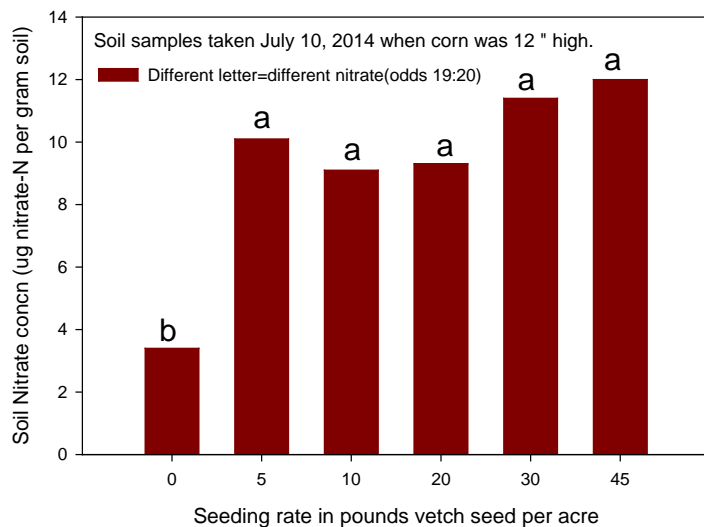


Figure 3. Nitrate availability for 2014 corn influenced by fall 2013 planted vetch

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