

Part 4. Oilseeds and Other Alternative Crops

Overwinter Nitrogen Cycling in Winter Canola



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Winter canola minimizes nitrogen (N) losses associated with leaf die-off by mineralizing of nitrogen from leaves dropped in the winter during spring regrowth and storing proteins in the taproot. Previous studies examining the N recovery following freezing temperatures have typically been conducted after stem elongation in the spring, and the role of overwinter N storage in the taproot at the rosette stage has largely been ignored. In 2016, an ¹⁵N tracer study was conducted in Davenport, WA, where the cotton-wick method was used to inject ¹⁵N-labeled urea into winter canola plants at two to three day intervals beginning with the six leaf stage and prior to the onset of freezing air temperatures in order to track the fate of leaf N. Plants were harvested prior to freezing, after five consecutive days of subfreezing temperatures, and at stem elongation during the spring. Plant growth was not affected by the labeling procedure; however, during a freezing period, root weight and width increased while above-ground biomass, crown height, and root length remained the same. Freezing did not affect the quantity of the tracer recovered in the shoots and roots, but a greater portion of the nitrogen tracer was stored in the roots and crown after freezing and early spring, which may indicate overwinter nitrogen storage in the taproot. On average, the overwinter recovery of the nitrogen tracer was high, and 75% of the N tracer added to winter canola plants in the fall remained in the plant or was recycled in the spring. Some of the tracer was also recovered in neighboring plants due to recycling of the leaf N in the soil. We recommend that growers account for winter vegetative nitrogen when making spring top-dressing recommendations.

Table 1. Biomass, total N, and ¹⁵N tracer recovery by leaves and roots, root length, and root width of winter canola plants in November, December, and March in Davenport, WA.

	November Autumn 	December Winter 	March Spring 
Leaves			
Biomass	31g	38g	27g
Total N	1.3g	1.4g	1.2g
¹⁵ N	2.6mg	2.9mg	2.2mg
Taproot			
Biomass	5g	9g	11g
Total N	0.14g	0.25g	0.35g
¹⁵ N	0.8mg	1.2mg	0.9mg
Length	193mm	202mm	230mm
Width	7.8mm	10mm	12mm

Large-Scale Spring Canola Variety Trials in Eastern Washington – 2016 Results



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Spring canola has proven to be a viable rotation crop in eastern Washington (WA), yet many producers remain hesitant it will work on their farm, and make a difference economically. With funding from Viterro, the WOCS team established