

ABSTRACT

Soil erosion and the loss of sugarbeet stands due to high winds sometimes occur in the spring
in eastern North Dakota and Minnesota. Living cover crops can be utilized to reduce or prevent

FORNSTROM, K. JAMES*, STEPHEN D. MILLER, and JAMES M. KRALL.
Univ. of Wyo., Civil Engr. Dept., Univ. Station Box 3295,
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protection of sugarbeets.

This paper describes management alternatives for utilizing cover crops as a living mulch for wind erosion protection during sugarbeet establishment. Fall seeded winter wheat and rye or spring seeded barley, oats and winter wheat were compared with no cover crop. Sugarbeet herbicides were band applied and rotary incorporated either in the fall or at sugarbeet planting with the fall seeded cover crops and at sugarbeet planting with the spring seeded cover crops. Cover crops were sprayed and then cultivated for removal. Erosion protection of sugarbeets with limited competition can be achieved if cover crop seeding, sugarbeet planting and cover crop removal are timed properly. The main competitive effect of the cover crop on sugarbeets is the reduction of population due to surface water depletion. Timing removal based on heat unit accumulation or cover crop growth provided more reliable removal date than the calendar. For example, when barley is used as a cover crop, the water use will be less than one inch if it is sprayed before 400 heat units are accumulated, or before 500 lb of dry matter is produced or before a height of 6 inches. Following these guidelines, sugarbeet population was reduced 10-20 percent but sugarbeet yields were equal or greater than with no cover crop.

minimize the competition with sugarbeet and a second herbicide treatment may be needed for
total control of the winter rye.

All previously mentioned herbicides postemergence grass control herbicides at all tested rates
have nearly total control of spring-seeded barley. Sethoxydim at 0.2 lb/A plus Dash at 1 qt/A
was broadcast applied to sugarbeet in spring-seeded barley at the 2-, 3-, 4-, or 5-leaf stage of
barley. Sugarbeet tended to yield less when barley control was delayed until the 4- or 5-leaf
stage as compared to the 2- or 3-leaf stage. In a second management scheme, sethoxydim was
hand-applied at the 3-leaf stage of barley and the barley

between the rows was removed with a row-crop cultivator at the 2-, 3-, 4-, or 5-leaf stage of
barley. Leaving the barley between the rows until the 2-leaf stage tended to improve sugarbeet
yield compared to earlier cultivation. These results suggest that barley in the row needs to be
controlled by the 3-leaf stage but barley between the row may provide beneficial protection if
left until the 2-leaf stage.

Winter rye grows very rapidly. For example, winter rye was 2 to 4 inches tall at sugarbeet
planting on May 4, 8 to 12 inches on May 21, 10 to 14 inches on May 28, 12 to 16 inches on
June 1, and 14 to 18 inches on June 7. Glyphosate was band-applied at planting and winter rye