Extend the Grazing Season for Weaned Calves with Cover Crops

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Extending the grazing season for weaned calves and cows has potential to reduce labor and costs for development of replacement heifers or backgrounding calves. To produce high quality forage for calves after weaning, short season crops such as turnips, rye and other small grains have been seeded after other crops have been harvested in late summer or early fall. As part of a series of studies to determine the feasibility of short season crops to extend the grazing season for weaned calves, planting date studies and a grazing trial were conducted near Brookings, SD. Small plots of turnips were seeded with a no-till drill into oat stubble on August 1 and August 15 in 2003. In 2004, rye and turnips were seeded on July 20, August 1, and August 15. Based on forage yield, planting these crops on or before August 1 in eastern South Dakota is recommended.

In late-September 2005, 44 weaned heifers were allotted by weight to graze rye or rye + turnips for 63 days. Following the grazing study, all heifers were fed and managed as one group until the following April. During the grazing study, heifers grazing rye + turnips gained 0.4 lbs less/day than heifers grazing rye. From the end of the grazing study to April the rye + turnips group gained 0.2 lbs more/day than the heifers that had grazed rye. This resulted in a similar average weight in April. Under the conditions of this study, short season crops such as rye or turnips are a feasible source of forage for grazing weaned calves.

Planting Date Studies

In the summer of 2003, a small plot study was conducted near Brookings, SD, to determine the effect of summer planting date on yield of turnips for fall grazing. Turnips were seeded to small plots (6 ft x 50 ft) on two planting dates (August 1 and August 15) using a no-till drill into oat stubble. The variety 'Purple Top White Globe' turnip was seeded at 4.5 lbs/ac. The field was top dressed with urea (46-0-0) at the rate of 75 lbs N/ac after the first planting date. Yield estimates were made on two harvest dates (October 15 and November 1). In the summer of 2004, the small plot study was repeated except that an earlier planting date was added and rye was included in the comparison. Rye and turnips were seeded to small plots (6 ft x 50 ft) on three planting dates (July 20, August 1 and August 15) using a no-till drill into oat stubble. The variety 'Dakold' rye was seeded at 75 lbs/ac and the variety 'Purple Top White Globe' turnips were seeded at 4.5 lbs/ac. The field was top dressed with urea (46-0-0) at the rate of 75 lbs N/ac after the first planting date. Yield estimates were made on three harvest dates (October 1, November 1 and December 1).

Highest yields for turnips were recorded for the July 20 planting date compared to either August planting date (Table 1). Rye had similar yield at either the July 20 or August 1 planting date, but was greater than the August 15 planting date. In 2003, forage yield of turnips was 90% less for the August 15 planting date compared to the August 1 planting date.

In 2004 the forage yields for turnips decreased by 47% from August 1 to the August 15 planting date (Table 1). The lower yield at the August 15 planting date in 2003 and 2004 was likely a result of late-summer accumulated precipitation. Accumulated precipitation by August 1 was similar for 2003 and 2004, but late-September precipitation was 3.2" greater in 2004 than 2003. The greater forage yield for turnips at the July 20 planting date (Table 1) is attributed to the favorable moisture conditions that existed by the timely precipitation prior to planting. It is unclear why forage yield of rye at the July 20 planting date was not greater than the August 1 planting date. Perhaps rye did not germinate as quickly as the turnips did to take advantage of the moisture that existed prior to planting. To ensure maximum forage yields of small grains such as rye or Brassica species such as turnips for fall grazing, planting on or before August 1 is recommended. Oats, winter wheat and spring wheat are typically harvested between July 15 and August 15 in eastern South Dakota, making them a desirable crop to follow with rye or turnips for grazing. Nitrogen fertilizer in the range of 50-75 lbs/ac is recommended to ensure adequate yields for fall growth.

Grazing Study

In the summer of 2005, a 40 acre field of oat stubble near Brookings, SD, was split into two fields; one field seeded with 80 lbs/ac of 'Dakold' rye and the other seeded with 40 lbs/ac 'Dakold' rye + 2 lbs/ac 'Purple Top White Globe' turnips using a no-till drill on July 27. Each field was top dressed with urea (46-0-0) at the rate of 50 lbs N/ac on July 30. The rye and rye + turnips established well and were ready for grazing by late-September. Turnips dominated the rye + turnips pasture. Rye and turnip plants were sampled on October 6, frozen and later analyzed for CP, NDF, ADF and ash.

Table 1. *Forage yield of rye and turnips.*

Species	Planting Date 2003		Planting Date 2004		
	Aug 1	Aug 15	Jul 20	Aug 1	Aug 15
	----------lbs/ac----------				
Rye			1985[c]	1988[c]	1234[d]
Turnip	3960[a]	390[b]	5268[a]	3940[b]	2101[c]

SE=188.5, means followed by similar letter within a year are not significantly different (p>0.05).

Table 2. *Composition of rye and turnips in grazing study.**

	Dry Matter (DM) Basis			
	%CP	%NDF	%ADF	%ASH
Rye	18.0	40.8	21.3	12.8
Turnip Tops	23.5	14.9	13.2	19.3
Turnip Bulbs	13.9	13.7	11.8	10.2

**Samples collected on 10/6/2005.*

Forty-four heifer calves were allotted by breed and weight to two grazing treatments starting on September 27, 1 week after they had been fence-lined weaned on pasture. Heifers were penned away from feed and water overnight prior to being weighed at the beginning and end of the 63 day grazing period. After the grazing period, all heifers were fed and managed as one group until weighed again on April 20.

Table 2 shows the nutrient composition of both rye and turnips. Both are relatively high in CP. The low NDF content of the turnips agrees with values reported in a previous report by South Dakota State University. Heifers consumed both the turnip tops and bulbs. They did not appear to selectively graze the tops, as some researchers had observed.

Heifers grazing turnips + rye gained 0.4 lbs less per day during the grazing period than those grazing ryegrass (Table 3). A possible explanation for this lower ADG could be the low NDF of the turnips. Although no disease symptoms were observed during the trial, some authors reported potential occurrence of polioenchephalomalacia, pulmonary emphysema, bloat and hemolytic anemia for cattle grazing Brassicas (plants in the turnip family). The heifers gained 0.2 lbs more per day from the end of the grazing period to the following April, resulting in similar mean weight in April for both groups. For development of replacement heifers the lower weight gain during the grazing period would not be expected to influence future productivity as long as they compensated prior to the breeding season the following spring.

Short season crops planted on or before August 1 can provide forage for fall grazing by spring born calves after weaning. Under conditions of this study, calves grazing rye could be expected to gain more than calves grazing rye + turnips.

Table 3. *Performance of heifers.*

	Rye	Turnips +		
		Rye	SE	P-value
Number of Heifers	22	22		
Average Initial Age	191	194	5	0.71
Weight, lbs				
Initial 9/27	514	512	14	0.90
End of Grazing Period 11/29	617	589	16	0.24
Yearling Weight 4/20	924	924	20	0.99
Average Daily Gain, lbs				
63 Day Grazing Period	1.63	1.23	0.06	<.001
End of Grazing to April	2.16	2.36	0.06	0.03
Initial to April	2.00	2.01	0.05	0.83

SE=standard error of the mean.