Onion Planting Configuration/Cover Crop Trial

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The study was conducted at the NDSU Carrington Research Extension Center on a loam soil. 'Teton' Onion was planted at124,000 seeds/acre in three-inch paired rows, spaced 18 inches apart on May 3, 2003. Individual plots were 6 ft by 25 ft. Onion planting configuration treatments were: spring- and fall-raised beds, raised bed followed by a dammer-diker, flat ground, and flat ground followed by a dammer-diker. Raised beds were 60 inches wide by 6 inches high. A spade was used to simulate the action of a dammer-diker on July 7. Planting configuration treatments were the main plots and arranged in a randomized complete block design with three replications. Cover crops were the split plots within each planting configuration. The cover crop treatments were: no cover, barley, and canola. Two rows of barley or canola were planted between the three onion rows at 60 and 5 lb/acre, respectively. On June 16, 1.5 pt Buctril + 0.6 pt Goal was applied to 2.5-leaf onion, and 6-inch tall barley and canola. Ultima 160 at 1.5 pt/A + 1 % v/v crop oil concentrate was applied on June 23 to 3-leaf onion, and 9-inch tall barley. A second application of Buctril + Goal was applied on July 7 to 5-leaf onion and 20-inch tall canola. The onions were harvested September 29 and cured in a forced air drier. Split and diseased bulbs were graded as culls regardless of diameter.

The fall beds were too hard to plant in the spring of the year and were dropped from the study. The dammer-diker application increased total onion yield, but the trend was not significant for the raised bed application. The canola cover crop reduced total yield due to label application restrictions with Buctril and Goal (Table 2). Both herbicides cannot be applied to onions before the 2-true leaf stage, which enabled the canola to grow beyond a controllable size.

Table 1. Effect of planting configuration on onion yield and grade when averaged over cover crop treatments.

	Yield							# of
Planting Configuration	<2 1/4"	2 1/4 to 3"	3 - 4"	4-4.5"	>4.5"	Total	Culls	Bulbs
	cwt/A							1000s/A
Raised bed / dammer-diker	3.8	31.1	365.1	128.5	48.2	576.7	0.0	65.2
Raised bed	5.0	34.8	370.9	113.1	37.4	561.2	4.2	67.6
Flat ground / dammer-diker	2.9	38.4	399.0	107.4	37.0	584.7	1.4	67.7
Flat ground	3.0	43.0	388.2	64.6	17.5	516.3	3.7	64.4
LSD (0.05)	1.8	9.6	NS	3.3	26.7	52.6	NS	NS

Table 2. Effect of cover crops on onion yield and grade when averaged over planting configuration treatments.

	Yield							# of
Cover Crop	<2 1/4"	2 1/4 to 3"	3 - 4"	4-4.5"	>4.5"	Total	Culls	Bulbs
	cwt/A							1000s/A
No cover	1.9	28.8	375.4	150.1	52.6	608.8	2.6	65.6
Barley	3.8	33.2	416.7	130.1	46.5	630.3	1.3	71.6
Canola	5.4	48.4	350.2	30.0	6.0	440.0	2.3	61.5
LSD (0.05)	1.3	6.8	37.2	23.4	18.9	37.2	NS	3.6