UNIVERSITY OF SASKATCHEWAN

VEGETABLE CULTIVAR AND CULTURAL TRIALS 2001

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Sequential Planting of Spinach

Spinach is a cool season crop well suited to production in spring in Saskatchewan. However, most growers report difficulties in establishing and growing good quality spinach crops during July and August. Cool soil temperatures (5oC) promote germination of spinach but emergence is slow from these cold soils. Higher soil temperatures induce thermal dormancy in spinach seed.. Bolting in spinach is triggered by long days (12-15 hours) and cold weather followed by warmer temperatures. Bolting sensitivity varies between cultivars.

This trial evaluated the performance of several cultivars of spinach sequentially planted over the course of the 2000 and 2001 growing seasons. The trials were conducted at the University of Saskatchewan Field Headquarters in Saskatoon (clay soil) and at the CSIDC in Outlook (sandy loam). The cultivars selected for trial were;

'Tyee' (Alf Christianson Seed Co) - a well adapted, bolting resistant cultivar
'Bloomsdale' - (Early's Farm & Garden) - a locally popular cultivar that matures early
'Olympic' (Alf Christianson Seed Co) - good yields and quality
'Hybrid No. 7' (Early's Farm & Garden) - very early

The crops were direct seeded into field plots rotovated and fertilized one week ahead of planting. The plot area was irrigated and managed according to standard recommendations for spinach. Each test consisted of 8m (2000) or 6m (2001) long rows of each cultivar replicated four times in a split plot design, with plantings as the main plots and cultivars as the sub-plots. Four plantings were tested in each season;

	2000			2001		
	Planted	**Harvested**	**Days to harvest**	**Planted**	**Harvested**	**Days to Harvest**
Planting 1	May 17	July 7	51	May 18	June 26	38
Planting 2	June 16	July 24	38	June 15	July 24	39
Planting 3	July 17	Sept 7	52	July 16	Sept 5	51
Planting 4	Aug 16	Oct 13	58	Aug 16	Oct 10	55

The crop was taken in a once over complete harvest when at least 50% of the plants were 10 cm tall or at the first sign of crop bolting. In 2001, the crop was harvested at a slightly earlier growth stage than in 2000. At harvest, each crop was evaluated for stand establishment, yields, crop quality and bolting.

Results

In both years, stand establishment at the Saskatoon site was superior to that in Outlook. In the 2000 trial this translated into a significant yield advantage for the Saskatoon site. The heavy clay soil in Saskatoon appeared to better retain the moisture required for germination of the spinach crop. The flavor and quality of the crops were comparable at the two test sites. In the 2000 trial, the cultivar Tyee

produce the best stand and the highest yields at both sites at all planting dates. In the 2001 trial, Olympia produced the best yields followed by Tyee. In both years Olympia and Tyee had good flavor and a very low incidence of bolting. Bloomdales had the highest proportion of the crop bolted in all trials.

	2000				2001			
	Stand (%)	Yield (g/m)	Bolting (%)	Taste (0-5)	Stand (%)	Yield (g/m)	Bolting (%)	Taste (0-5)
Saskatoon	61	850	7	2.7	94	1033	19	3.1
Outlook	31	712	8	2.5	85	916	8	2.7
Tyee	60	900	1	2.9	94	1133	7	2.9
Olympic	48	737	4	2.8	94	1266	8	3.2
Bloomsdale	40	575	31	2.0	100	700	29	2.9
Hybrid #7	41	662	11	2.5	73	783	10	2.6
Planting 1	71	1525	13	2.5	67	900	10	3.1
Planting 2	73	837	17	2.8	87	950	32	2.8
Planting 3	17	325	1	2.7	85	1500	12	2.7
Planting 4	22	75	0	2.3	100	516	0	2.4

In the 2000 trial, the first and second plantings produced a better stand and much higher yields than the third or fourth plantings. By contrast, in 2001, the third planting produced an excellent stand and the highest yields of any trial. It does not appear that the soil temperatures encountered mid-summer in Saskatchewan are high enough to trigger thermal dormancy in spinach. In both years, the second planting had the highest percentage bolting - this indicates that the daylength and temperature encountered by this planting are not favorable to holding the crop in a vegetative state. The fourth planting produced very little at either site in both years - late summer conditions were not conducive to rapid growth of the crop. In the 2000 trial, time of planting had no impact on crop flavor, but in the 2001 trial the earliest plantings were considered superior.

Conclusions

Yield potential for sequentially planted spinach varied somewhat with the growing season. Planting from early May through early July produced acceptable yields, although planting near the longest days of the year triggered early bolting. Tyee and Olympic appear best suited to the daylengths and temperatures encountered during the Saskatchewan growing season. None of the cultivars tested were suited to planting after mid-August.