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Current Information Series No. 526

January 1980

Spring-Planted Austrian Winter Peas

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Austrian winter peas are normally planted in the early fall and are harvested the following July as a dried seed crop. During severe winters when the small pea plants are exposed to long periods of sub-zero weather without snow cover, they may be winter-killed. Plants that are not killed may be severely weakened and later die from damage inflicted by the pea leaf weevil or diseases. Additionally, the lack of spring cultivation in winter peas may result in severe weed infestations that reduce seed yield and increase the difficulty of harvest. These problems have led to increased interest in the possibility of planting Austrian winter peas in the spring.

Although most Austrian winter pea varieties do not require exposure to cold temperatures for flowering, fall-planted winter peas flower and mature sooner than spring-planted winter peas. Later flowering and maturity could reduce seed yield because of heat and moisture stress. A successful variety of spring-seeded Austrian winter peas should have seed yields comparable to those of a spring pea variety. In 1976, trials were initiated to determine the yield potential and cultural practices needed for production of spring-seeded winter peas.

Variety Testing

In 1976, 1977 and 1978, 6 genotypes of Austrian winter peas were compared to 2 varieties of spring peas in 5 spring-seeded trials located at Moscow, Nezperce and Grangeville. The mean seed yields of these 5 trials ranged from 1,285 pounds of seed per acre at Nezperce in 1976 to a high of 3,290 pounds of seed per acre in Moscow in 1978 (Table 1).

Spring-planted Austrian winter pea varieties usually yielded 300 to 400 pounds per acre less than the spring varieties. However, one Austrian winter pea genotype, ID 89-1, averaged 2,308 pounds per acre in the 5 spring-seeded trials while Garfield and Latah averaged 2,476 and 2,370 pounds per acre, respectively (Table 1). ID-89-1 is a semi-dwarf breeding line with a determinant growth habit.

In 3 of the 5 trials the top yielding varieties were Austrian winter peas (Table 1). The 3 available varieties of Austrian winter peas (Melrose, Fenn and Common) appear to be equally adapted to spring seeding. When spring-seeded, these 3 winter varieties averaged 400 pounds per acre less than Garfield. Spring-seeded Austrian winter peas generally mature 20 to 30 days later than the spring pea varieties. Spring-seeded Austrian winter peas generally matured in late August or early September.

In 1978, a study was conducted at Moscow to compare fall and spring seedings of 6 varieties of Austrian winter peas. The varieties were planted at two dates in the fall — Sept. 2 and Oct. 4 — and on one date, May 2, 1978, in the spring. The fall-planted peas matured 16 days earlier and averaged 6,575 and 6,000 pounds per acre, respectively, for the Sept. 2 and Oct. 4 planting dates. The spring-planted peas averaged only 1,417 pounds per acre. This reduction in seed yield was caused by pea leaf weevil damage in the early spring and extremely hot, dry weather when the spring-seeded peas were flowering. Had the spring-planted peas been seeded earlier, this reduction would probably not have been as severe.

Table 1. Seed yield of spring-planted winter and spring peas in northern Idaho.

Variety	Trials					Average yield
	Moscow 1976	Nezperce 1976	Moscow 1977	Grangeville 1977	Moscow 1978	
(lb./acre)						
Spring peas						
Garfield	2280ab*	1470abc	2460abc	1860a	4310a	2476
Latah	2380a	1740ab	2340bc	1480a	3910ab	2370
Winter peas						
Melrose	1730bc	920c	3240ab	1780a	2660c	2066
Fenn	1420c	580c	3250ab	1560a	3500abc	2062
Common	1710bc	1050bc	—	—	2990c	—
Romack	1790bc	2030a	2130bc	1450a	3390bc	2158
ID 2	1800abc	1270bc	1990bc	1980a	2900c	1988
ID 89-1	2140abc	1220bc	3720a	1800a	2660c	2308
Average of trial	1906	1285	2733	1701	3290	
Planting date	May 11	May 4	April 12	April 18	April 13	
Harvest date, spring peas	Aug. 16	Aug. 18	Aug. 5	Aug. 4	Aug. 2	
Harvest date, winter peas	Sept. 4	Sept. 2	Aug. 31	Sept. 6	Aug. 27	

*Means within a column not followed by the same letter differ at the .05 level by Duncan's multiple range test.

Table 2. Seed yield of Austrian winter peas seeded at two dates in the fall and one day in the spring at Moscow.

Variety	Date planted		
	Sept. 2, 1977	Oct. 4, 1977	May 2, 1978
(lb./acre)			
Romack	7580	6740	1520
ID 113	6920	5390	1530
Fenn	7680	6110	1310
Melrose	5650	6830	1360
Common	6060	5550	1190
ID 89-1	5540	5380	1590
Average yield*	6575	6000	1417
Date harvested	9/11/78	9/11/78	9/27/78

*To be significantly different at the 0.05 level of probability by protected LSD test, any two means must differ by a value greater than 304 pounds of seed per acre.

Table 3. Seeding rates and yields of spring-seeded Austrian winter field peas in Moscow, 1977.*

Genotypes	Seeding rates				Means
	90	120	150	180	
(lb./acre)					
Fenn	4188	3953	4173	3868	4046a**
ID-89-1	3623	4623	4158	3238	4037a**
Common	3833	3593	3655	3681	3690a**
Means	3881a**	4056a	3996a	3763a	

*Precipitation September 1976 through August 1977 was 15.16 inches, 7.46 below normal.

**Means within a column or row followed by the same letter are not significantly different at the .05 level according to Duncan's multiple range test.

Table 4. Seeding rates and yields of spring-seeded Austrian winter field peas in Grangeville, 1977.*

Genotypes	Seeding rates				Means
	90	120	150	180	
(lb./acre)					
Fenn	1304	1016	1075	1776	1293a**
ID-89-1	1012	879	1012	790	923a
Common	1418	1221	1046	1226	1228a**
Means	1245a**	1039a	1044a	1264a	

*Precipitation September 1976 through August 1977 was 16.55 inches, 6.94 inches below normal.

**Means within a column or row followed by the same letter are not significantly different at the .05 level according to Duncan's multiple range test.

Table 5. Seeding rates and yield of spring-seeded Austrian winter field peas in Moscow, 1978.*

Genotypes	Seeding rates				Means
	90	120	150	180	
Fenn	3017cd***	2970cd	3039cd	3336ab	3090a**
ID-89-1	2936cd	3156bc	3481a	2980cd	3138a
Common	2638d	2839cd	2713d	2751d	2735b
Means	2864a**	2988a	3078a	3022a	

*Precipitation September 1977 through August 1978 was 30.43 inches, 7.81 inches above normal.

**Means within a column or row followed by the same letter are not significantly different at the .05 level according to Duncan's multiple range test.

***Yields within a row or column followed by the same letter are not significantly different at the .05 level according to Duncan's multiple range test.

Seeding Rates

Appropriate seeding rates for spring-planted Austrian winter peas varied with precipitation amounts and distribution. In Moscow, precipitation from September 1976 through August 1977 was 7.46 inches below normal. Soil storage moisture was good but rainfall in June, a crucial month for pea production, was 1.12 inches below normal. Seeding rates from 90 to 180 pounds per acre had no influence on seed yield (Table 3). Without sufficient moisture, peas had no opportunity to respond to increased seeding rates. Under these conditions, 90 pounds of seed per acre gave maximum yields of Fenn and Common. Seed yields of ID-89-1 tended to increase as seeding rates increased from 90 to 120 pounds per acre, but this increase was not statistically significant.

At Grangeville in 1977, a dry year caused responses to seeding rates similar to those observed at Moscow (Table 4). Seeding rates did not influence yield.

At Moscow in 1978, precipitation was 30.4 inches, 7.8 inches above normal. Fenn and ID-89-1 significantly outyielded Common in this wet year (Table 5). Maximum yield of Fenn occurred when seeding rates of 180 pounds per acre were used but no significant yield increases of Fenn were noted between 90 and 150 pounds per acre. Common did not show a significant increase in yield as seeding rates increased from 90 to 180 pounds per acre. Genotype ID-89-1 had maximum seed yield at a seeding rate of 150 pounds per acre. This semi-dwarf genotype appeared well adapted to above-normal precipitation and had a higher yield than Fenn or Common at seeding rates of 120 to 150 pounds per acre.

General Recommendations For Seeding Rates

Small seeded varieties (4,400 seeds per pound) such as Melrose, Fenn or Common should be planted at 90 pounds per acre (Table 6). Larger seeded varieties (3,600 seeds per pound) such as Romack and ID-89-1

Table 6. Seeding rates and yield of spring-seeded Austrian winter field peas.*

Genotypes	Seeding rates				Means
	90	120	150	180	
Fenn	2836	2646	2762	2993	2809a**
ID-89-1	2524	2886	2884	2502	2699ab
Common	2630	2551	2471	2553	2551b
Means	2663a**	2694a	2706a	2683a	

*Means represent three location-years: Grangeville, 1977; Moscow, 1977 and 1978.

**Means within a column or row followed by the same letter are not significantly different at the .05 level according to Duncan's multiple range test.

should be seeded at 120 pounds per acre. These rates are the equivalent of planting 5 to 6 seeds per foot of row and should establish 3 to 5 seedlings per foot (Table 7). Higher seeding rates do not increase seed yield, even though the number of seedlings established per foot increase (Tables 6 and 7). Heavy straw residues and rough seedbeds with large clods contribute to poor seed placement and germination so seeding rates should be increased on such fields. Seed with germination exceeding 90% should be used.

Seedbed Preparation

Spring-seeded winter peas do best when planted in a seedbed with a minimum of straw residue on the soil surface. Work the soil when it is moist enough to prevent large clod formation, but dry enough to prevent compaction and crusting. Avoid overworking the soil and creating a thick layer of finely pulverized soil. Roll the soil before and after planting. This will improve contact of soil with seed and will improve uniformity and speed of germination. Soils with a high clay content or soils worked too wet are susceptible to crusting if rolled.

Dates of Seeding

Spring-planted Austrian winter peas should be seeded as early as possible in the spring — at approximately the same time as spring wheat and barley. In northern Idaho and eastern Washington, plant peas

Table 7. Stand establishment of spring-seeded Austrian winter field peas.

Genotypes	Seeding rate (lb./acre)	Seeds planted per foot	1977	1977	1978
			Grangeville*	Moscow*	Moscow**
			Plants established per foot		
Fenn	90	4.7	3.7	2.6	3.8
	120	6.5	5.2	3.5	5.1
	150	7.7	5.7	5.3	5.8
	180	9.7	6.3	5.8	6.8
ID-89-1	90	3.6	2.9	2.0	2.4
	120	4.8	4.1	3.2	3.4
	150	6.0	4.4	3.2	3.8
	180	7.2	4.1	4.2	4.6
Common	90	5.2	5.1	3.1	4.1
	120	7.0	6.3	4.0	5.8
	150	8.6	6.4	5.4	5.8
	180	11.1	7.9	7.2	7.2
Means		6.8	5.1	4.1	4.9
Dates of stand counts			6/3/77	—	5/22/78

*Planted April 18, 1977 at Grangeville and April 14, 1977 at Moscow.

**Planted April 13, 1978 at Moscow.



Fig. 1. Austrian winter pea plots at off station research facility, Grangeville, in 1979.

as early as March 25 at the lower elevations and May 1 at the higher elevations. Delayed seeding often reduces both the quality and seed yield of dry peas. Spring-planted Austrian winter peas take about 16 days longer to mature than spring peas and early seeding is essential for maximum yields. Increased seeding rates will not improve yields of late spring-seeded winter peas.

Other Cultural Practices

Spring-planted Austrian winter peas require the same weed control, insect control and fertilizer practices as spring peas. For details on these requirements consult your local county agent, chemical dealer and University of Idaho Bulletin No. 578, Dry Pea and Lentil Production in the Pacific Northwest.

Conclusions

Spring-planted Austrian winter peas will yield less than spring peas and will take longer to mature than

spring peas. Winter peas are less susceptible to *Ascochyta* and *Fusarium* root rot than spring peas and may provide a yield advantage over spring peas in areas where these diseases cause yield losses. Market prices for winter peas have been higher than prices for spring peas in recent years. These advantages, coupled with savings from lower seeding rates, may make net returns of spring-planted peas and spring peas comparable.

Seeding rates for spring-planted Austrian winter peas should be 90 pounds per acre for small-seeded varieties and 120 pounds per acre for large-seeded varieties. Early seeding is essential for best yields of spring-planted Austrian winter peas.

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Acknowledgment — The Idaho Pea and Lentil Commission provided part of the financial support for this research.

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