

PROGRESS REPORT
**FORAGE CROP
INVESTIGATIONS**
1962

BREEDING AND STRAIN TESTING



Crop Science Department
Ontario Agricultural College
Guelph

Forage Progress Report - 1962

This report contains data on O.A.C. trials. It is not complete in that only the data summarized by April 1, 1962, are included. The report is prepared for use of the members of the Crop Science Department and for those associated with the forage program.

A federal-provincial program is in operation in variety and mixture testing and in orchardgrass breeding. This report contains some of the data collected by the Field Crops Division, Western Ontario Agricultural School, and by the Field Husbandry Division, Kemptville Agricultural School, but does not include data collected by federal stations in the co-ordinated program. The complete data from all stations for the co-ordinated program, are available in the report of the annual meeting of the Forage Crop Sub-committee for Recommendations, November, 1962.

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and number in brackets is experiment number)

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1962 GROWING SEASON WEATHER RECORD

<u>TEMPERATURE</u>		<u>APRIL</u>	<u>MAY</u>	<u>JUNE</u>	<u>JULY</u>	<u>AUGUST</u>	<u>SEPTEMBER</u>
Harrow	Max.	57.2	74.5	78.8	77.8	78.6	68.8
	Min.	37.5	53.4	59.4	60.8	60.9	52.9
Ridgetown	Max.	56.4	73.3	76.3	78.4	78.5	67.8
	Min.	36.1	51.4	57.6	58.4	59.3	51.0
Guelph	Max.	53.0	70.2	72.8	73.3	77.8	65.3
	Min.	33.3	47.4	53.3	54.5	53.6	44.7
Kemptville	Max.	50.0	69.8	76.6	77.1	77.9	65.7
	Min.	30.0	44.5	51.2	52.7	55.8	46.6
Ottawa	Max.	50.3	69.3	76.6	75.8	76.5	64.6
	Min.	31.3	47.3	54.4	53.0	56.6	46.8
New Liskeard	Max.	43.4*	66.1*	72.5*	76.7*	74.4	60.9*
	Min.	24.7*	42.9*	43.6*	49.4*	50.9	43.0*
Kapusksasing	Max.	40.8	62.7	71.4	73.5	69.8	57.3
	Min.	19.9	37.5	40.1	48.0	43.3	40.3
Gore Bay	Max.	46.4	63.8	71.2	76.2	73.9	62.8
	Min.	29.4	42.9	50.8	55.2	55.5	47.8
Fort Francis	Max.	45.3	62.7	72.2	73.5	74.6	63.3
	Min.	24.5	42.9	52.0	53.0	53.1	42.2
<u>RAINFALL</u>							
Harrow		1.23	1.41	2.02	6.08	3.40	2.67
Ridgetown		1.72	1.12	4.60	3.61	5.65	2.97
Guelph		2.12	0.94	3.36	3.04	2.00	2.67
Kemptville		2.49	1.68	2.60	3.82	1.75	2.92
Ottawa		2.38	1.52	2.88	5.09	2.21	2.77
New Liskeard		inc.*	inc.*	2.00	3.27	1.95	2.44
Kapusksasing		0.76	6.38	2.02	4.74	6.29	5.05
Gore Bay		1.86	3.41	0.68	0.75	2.40	4.09
Fort Francis		0.74	7.12	3.67	5.59	2.90	4.11

* incomplete data

DEPARTURES OF 1962 GROWING SEASON

FROM NORMAL

<u>TEMPERATURE</u>		<u>APRIL</u>	<u>MAY</u>	<u>JUNE</u>	<u>JULY</u>	<u>AUGUST</u>	<u>SEPTEMBER</u>
Harrow	Max.	+1.1	+6.1	- .1	-6.0	-3.3	-5.9
	Min.	+1.3	+6.6	+1.7	-2.6	+ .9	-1.5
Ridgetown	Max.	+3.7	+8.5	- .4	-3.5	-1.6	-4.3
	Min.	+ .6	+5.6	+1.3	-2.7	- .4	-2.9
Guelph	Max.	+2.3	+6.6	-1.3	-5.6	+ .5	-4.6
	Min.	+ .9	+4.5	+ .7	-2.4	-2.0	-4.3
Kemptville	Max.	-1.5	+3.3	+ .1	-4.3	- .9	-4.4
	Min.	-1.8	+ .4	-2.5	-5.3	- .2	-1.5
Ottawa	Max.	+0.5	+4.0	+1.4	-4.0	-1.3	-4.2
	Min.	+ .1	+4.1	+1.4	-4.5	-1.6	-1.1
*New Liskeard	Max.	-2.5	+3.9	+ .1	- .1	- .4	-4.0
	Min.	+ .4	+6.5	-3.9	-3.7	+ .2	- .1
Kapuskasing	Max.	-1.4	+5.1	+2.0	-1.0	-1.5	-3.9
	Min.	+ .5	+3.6	-5.0	-3.2	-6.3	-1.3
Gore Bay	Max.	-1.4	+5.5	- .1	-1.5	-1.5	-1.5
	Min.	+2.1	+4.4	+2.4	+ .5	+1.9	+ .4
Fort Francis	Max.	-2.7	+ .4	+ .7	-4.1	+ .3	- .7
	Min.	-3.9	+1.7	+ .9	-2.6	-1.0	-3.1

RAINFALL

Harrow	-1.3	-1.0	-1.0	+3.8	+1.2	+ .2
Ridgetown	-1.3	-2.0	+1.7	+ .7	+3.2	+ .1
Guelph	- .6	-2.2	+ .2	- .5	- .9	- .3
Kemptville	- .1	-1.6	0.0	+ .3	- .8	- .3
Ottawa	- .2	-1.3	- .5	+2.4	- .8	- .3
New Liskeard	--	--	-1.3	- .3	-1.0	- .9
Kapuskasing	-1.0	+4.0	- .7	+1.4	+3.0	+1.9
Gore Bay	- .4	+1.1	-1.8	-1.2	+ .3	+1.0
Fort Francis	-1.4	+4.5	- .2	+2.0	-1.0	+ .8

Total
~~- 2.8~~ 4.3

* Incomplete data

NORMAL GROWING SEASON WEATHER RECORDS FOR
CERTAIN ONTARIO STATIONS

<u>TEMPERATURE</u>		<u>APRIL</u>	<u>MAY</u>	<u>JUNE</u>	<u>JULY</u>	<u>AUGUST</u>	<u>SEPTEMBER</u>
Harrow	Max.	56.1	68.4	78.9	83.8	81.9	74.7
	Min.	36.2	46.8	57.7	62.2	60.0	54.4
Ridgetown	Max.	52.7	64.8	76.7	81.9	80.1	72.1
	Min.	35.5	45.8	56.3	61.1	59.7	53.9
Guelph	Max.	50.7	63.6	74.1	78.9	77.3	69.9
	Min.	32.4	42.9	52.6	56.9	55.6	49.0
Kemptville	Max.	51.5	66.5	76.5	81.4	78.8	70.1
	Min.	31.8	44.1	53.7	58.0	55.6	48.1
Ottawa	Max.	49.8	65.3	75.2	79.8	77.8	68.8
	Min.	31.2	43.2	53.0	57.5	55.0	47.9
New Liskeard	Max.	45.9	62.2	72.4	76.8	74.8	64.9
	Min.	24.3	36.4	47.5	53.1	50.7	43.1
Kapuskasing	Max.	42.2	57.6	69.4	74.5	71.3	61.2
	Min.	19.4	33.9	45.1	51.2	49.6	41.6
Gore Bay	Max.	47.8	59.3	71.3	77.7	75.4	64.3
	Min.	27.3	38.5	48.4	54.7	53.6	47.4
Fort Frances	Max.	48.0	62.3	71.5	77.6	74.3	64.0
	Min.	28.4	41.2	51.1	55.6	54.1	45.3
<u>RAINFALL</u>							
Harrow		2.5	2.4	3.0	2.3	2.2	2.5
Ridgetown		3.0	3.1	2.9	2.9	2.4	2.9
Guelph		2.7	3.1	3.1	3.5	2.9	3.0
Kemptville		2.6	3.3	2.6	3.5	2.6	3.2
Ottawa		2.6	2.8	3.4	3.5	3.0	3.1
New Liskeard		1.7	2.2	3.3	3.6	2.9	3.3
Kapuskasing		1.7	2.3	2.8	3.3	3.2	3.2
Gore Bay		2.3	2.3	2.5	2.0	2.1	3.1
Fort Frances		2.1	2.6	3.9	3.6	3.9	3.3

This test was discontinued in 1962 but the following yields were collected:

<u>Cut June 8</u>		<u>Cut June 15</u>	
Narragansett	4050	Vernal	4730
Tuna	3900	Ranger	4320
FD 100	3710	Beaver	4220
Cardinal	3560	Cayuga	4010
DuPuits	3540		
Glacier	3540		
Rhizoma	3440		
Alfa	3230		

COMMENTS ON TEST 532

1. The five Saskatchewan synthetics, bred for a more northern area, where winter comes earlier, appeared somewhat unadapted to this region. In comparison with Vernal and DuPuits, they were lacking in vigor and in aftermath recovery.
Instead of utilizing our complete growing season, they tended to stop growing a bit early in order to get ready for winter. Their seasonal output of dry matter was correspondingly reduced.
Teton, Ladak, and Rambler suffered from the same defects, perhaps even to a greater extent.
2. The new Cornell variety, Cayuga (N.Y. Syn. B), was in about the same yield class as Vernal and what it lacks in the first cut, it makes up for in the aftermath. Its growing season may match our climate a little better than does Vernal's which in open falls does not utilize the complete season.
3. Of the newer varieties, Glacier (Tourneur 505), seems most promising. Cardinal and FD 100 are frequently winter injured to a greater degree.
4. Narragansett, were it wilt resistant, would be as close to an ideal variety as anything else available.
5. Atlantic, Williamsburg, Buffalo are not sufficiently winter hardy for this district.
6. Ranger usually loses enough plants each winter to put it at a serious disadvantage in comparison with Cayuga, Vernal, or Narragansett.

TEST 545.

- May No observable winter-kill in May, 1962; excellent stand.
- June 13 The varieties ranked according to earliness of flowering:
DuPuits, Orchies, Cardinal (501), Cornell. 5;
Cornell 3;
Cornell 4, Narragansett, Haymor (NK-502), NK-503;
Syn. A;
Vernal, Syn. B., NK-504.
- June 13 Harvested; average yield 3,500 lb. of dry matter.
High Seed Set Narragansett yielded significantly more than
any other variety except Vernal.
- July Severe drought; a little die-back, especially in the fast
growing DuPuits, was visible before irrigation water could
be applied.
- July 16 Harvested at the bud stage, the height being 15-18".
Cardinal, DuPuits, and Orchies were significantly higher in
yield than Cayuga, Vernal, Narragansett.
- July 23 Irrigated.
- Aug. 20 Harvested second aftermath cut in the bud stage.
Although differences were not significant, DuPuits, Orchies,
and Cardinal averaged about 200 lb. more than Vernal, Cayuga,
or Narragansett.
- Oct. 2 Varieties ranked according to fall growth:
DuPuits, Cornell 5, Haymor, Cardinal, Orchies;
All others. Cayuga shows a little more growth than Vernal.

1962 Comments:

No significant differences were found for the year's total.
Cornell 3 yielded about 500 lb. more than the average, and
Cayuga and Vernal were about average.

In the yield trial table, varieties are ranked according to
their 1961-2 mean yields.

Cornell 4, Cornell 5, New York Syn. A and NK - 503 are being
withdrawn, in some instances for further selection. The
status of Cornell 3 which has been very promising in both
545 and 570 tests is uncertain.

Test 545

Alfalfa, Provincial Screening Trial, Guelph, 1960 SeedingYields in Lbs. D.M. Per Acre

Variety or Strain	1962				Total Cut 1,2,3	1961 Total	1961-2 Mean
	Hay Cut 1	Aftermath Cut 2	Pasture Cut 3	Pasture Total			
High Seed Set Narragansett (Cornell 3)	4088	1413	2223	3636	7724	8124	7924
Wilt-resistant Flemish (Cornell 5)	3519	1542	2359	3901	7420	7989	7704
Vernal	3749	1383	2143	3526	7275	8092	7683
Wilt-resistant Narragansett (Cornell 4)	3565	1380	2189	3569	7134	8207	7670
DuPuits	3289	1679	2453	4132	7421	7836	7628
Cardinal (NK - 501)	3323	1715	2212	3927	7250	7936	7592
Narragansett	3633	1381	2139	3520	7153	7946	7540
Orchies	3389	1587	2301	3888	7277	7668	7472
Haymor (NK - 502)	3211	1555	2217	3772	6983	7811	7300
Cayuga	3524	1420	2175	3595	7119	7546	7333
NK - 503	3481	1321	2131	3452	6933	7617	7274
N.Y. Syn. A	3321	1394	2307	3701	7022	7386	7204
NK - 504	3477	1402	2169	3571	7048	7212	7130
Mean	3505	1473	2232	3706	7210	7797	7503
L.S.D. 5%	319 lb.	168 lb.	N.S.		N.S.	N.S.	
C.V.	6.3%	7.9%	6.7%		5.0%	3.8%	

1962 Comments on the Final Evaluation Test, Guelph, 1961 SeedingTest 570Pasture Section

- May 25 - harvested
- June 5 - order of recovery is Ontario, Cornell, Cayuga, Vernal, Beaver.
- Beaver contains considerable brome, Vernal less and the others scarcely any.
- June 28 - Ontario, Cayuga are 14" high, with no brome, Cornell 13", Vernal 12" with a little brome, Beaver 9" with about 40% of the sward showing as grass.
- June 28 - harvested
- July 5 - order of recovery is Ontario, Cornell, Cayuga.
Vernal is a little slower, Beaver much slower.
- July 27 - harvested at the medium bud stage.
- Aug. 9 - 25% of the plants in Cornell are outstandingly taller than the others. 5% of Ontario is similar. The others are uniform.
- Sept. 6 - Ontario, Cornell, Cayuga are 16" high, no grass. Vernal 14" with a little brome, Beaver 10" with considerable brome. Cornell is extremely variable.
- Sept. 6 - harvested
- Oct. 2 - Ontario, mostly rosetted, 3-4" with a few plants 5" high, Cornell - 50% rosetted, remainder 5-9" high, Cayuga - intermediate between Ontario and Vernal Vernal - all but 5-10% of the plants are rosetting, a little brome, Beaver - all but 2-5% of the plants are rosetting, a good sprinkling of brome.
- Oct. 15 - Ontario 5-9", Cornell 4-12", Cayuga 3-8", Vernal 4-8", Beaver 3-5".
Ontario Variegated is covering the ground better than any of the others.
All plots have a quite satisfactory stand.

Hay Section

- June 5 - The brome is much more plentiful in the Beaver plots than in any of the others. Vernal has a moderate amount and the other three only a slight amount.

- June 21 - Harvesting at 1/3 - 1/2 bloom as rainy weather had prevented harvesting at 1/10 bloom.
Order of maturity - Ontario and Cornell; Cayuga: Vernal and Beaver.
Regrowth at the base was evident in the first three, to a lesser extent in Vernal, and not at all in Beaver.

- July 5 - Little difference in recovery growth among Ontario, Cornell and Cayuga, but in that order if anything. Vernal is a little slower, Beaver much slower.

- July 12 - Hay aftermath harvested in the medium bud stage.
Rep. 1 and 2 were about 16" high, Rep. 3 about 12", Rep. 4 was 8".

- Aug. 9 - Cornell irregular in height, Cayuga very uniform.

- Aug. 24 - Hay aftermath harvested in the medium bud stage.

- Sept. 6 - Cornell extremely variable in height.

- Oct. 2 - Cornell 12-16", irregular, trace of brome only.
Ontario 12" with a few shoots 16", trace of brome only.
Cayuga 12-14" with a few shoots 16", trace of brome only.
Vernal 12", moderately even, with a little brome.
Beaver 4-7", fairly uniform, a good deal of brome.

- Oct. 15 - Cornell 14-18", Ontario 14-16", Cayuga 15", Vernal 14", Beaver 4-8".
The stand in all plots is very satisfactory.

- Oct. 25 - 4-6" of snow.

Text 570

Alfalfa, Final Evaluation Test, Guelph, 1961 Seeding

Yields in lb. D.M. (Legume + Grass)/Acre

Variety	Management System								
	Hay and Aftermath Pasture*				Pasture				
	June 21 Cut 1	July 12 Cut 2	Aug. 24 Cut 3	Total	May 25 Cut 1	June 28 Cut 2	July 27 Cut 3	Sept 6 Cut 4	1962 Total
Cayuga	3797 91 ⁺	1647 96	2763	8207	3752 88	2222 98	1775	2161 100	9910
Vernal	4352 84	1604 94	3006	8962	3932 84	2029 95	1655	2058 98	9674
Beaver	4672 69	1171 86	2513	8356	3490 57	1697 85	1450	1814 94	8451
Ont. Variegated	4212 82	1844 94	2576	8632	4053 87	2349 99	1891	2385 100	10678
Cornell 3	4452 85	1702 96	2806	8960	3935 88	2225 98	1814	2090 100	10064
Mean	4297	1594	2733	8624	3832	2104	1717	2102	9755
L.S.D. 5%	N.S.	265	N.S.		N.S.	156	N.S.	190	
C.V. in %	9	10	9		11	5	9	6	

⁺ Percent legume

* A very heavy snowfall coming in late October prevented the harvesting of the fourth cut. This cut would have added only a few hundred pounds to Beaver's total, but over a thousand pounds, it is estimated, to that of the other four.

ALFALFA - NEW SEEDINGSTEST 573

A new seeding of 12 strains or varieties was made on range 11E N.W. end. Establishment was generally satisfactory, Tuna excepted, but growth was slow and weeds were plentiful. Irrigation and weed sprays were applied. A fertilizer application of 0-20-30 was applied on October 2, at the rate of 250 lb. per acre.

In addition to Vernal, DuPuits, Beaver, Tuna, and Glacier (Tourneur 505) the test included the following entries.

- Eynsford - an English selection out of southern French types. Sponsored by Smith Seeds, Toronto,
- Progress (CL-10) - Bred by I.J. Johnson, Caladino Farm Seeds. DuPuits type.
- Mega - Bred at Svalof. Sponsored by Hogg & Lytle.
- A9H - Flamande type. Sponsored by Ontario Seed Cleaners, Toronto.
- Europe - more winter hardy than FD 100. Sponsored by Walcott-Taylor.
- Warrior (NK507) - later than DuPuits, some resistance to bacterial wilt.
- NK 508 - similar to NK 507.

During the growing season, it was noted that A9H showed much more yellowing of the leaves than did any other variety.

Tuna was thin on the ground, apparently because of seed of inferior quality.

Beaver was noticeably slow and lacking in vigour.

Progress (CL-10) was below average in appearance.

On the other hand, Warrior, Eynsford and DuPuits were above average in vigour and in leaf greenness.

"ONTARIO VARIEGATED" SEED LOTS PRODUCED IN NIAGARA PENINSULA

Lot No.	Source	1961			1962				Average 1961-62
		June	Aug.	Total	June	July	Sept.	Total	
12	Dalgleish	5489	4317	9806	5601	3351	3175	12127	10966✓
2	Rep. Sample from Niagara Peninsula	5080	4382	9462	4948	3390	3078	11416	10439✓
4	Neichhold Jarvis - Farm 1	5475	3818	9293	5839	2950	2744	11533	10413✓
9	Hubert Lint	5732	3975	9707	5040	3193	2577	10810	10258✓
10	Piper	5175	4144	9319	4209	3376	3093	10678	9999
11	Best	5548	4179	9727	4139	3167	2885	10191	9959
1	Virgil Turnbull, R. #1, Paris	5064	4127	9191	4928	3019	2751	10698	9945
6	H. Mattice	5199	3661	8860	4496	3375	3092	10963	9912
5	Neichhold Jarvis - Farm 4	4891	3670	8561	5149	3020	2706	10875	9718
3	Neichhold Jarvis - Farm 5	5304	3708	9012	4891	2893	2367	10151	9582
8	S. Cade	4818	3766	8584	4608	2935	2692	10235	9410
7	S. Pollard	4707	4412	9119	3762	3015	2506	9283	9201
	Vernal	5502	4285	9787	5168	3218	2990	11376	10582
	DuPuits	5988	4744	10732	4963	3180	3045	11188	10960

ALFALFA SCREENING TRIAL (W.O.A.S.)

This trial was established in 1961 following the procedures used in the co-operative alfalfa screening trials. During the winter and spring of 1962 considerable winterkilling occurred. The winterkilling on four of the replicates could be attributed largely to ice cover. However, the remaining replicates were not ice-covered. There was very little snow cover on the test which could have been a factor in the winter-killing. Good differential survival data are reported in the second table for the two replicates which were not ice covered.

Yield data of the first cut are reported for two replicates to give some indication of the effect of winterkilling on yield.

ALFALFA SCREENING TRIAL (W.O.A.S.)

11

Seeded - May 12, 1961 - 12 lbs. per acre

Variety	Fall Vigor* Sept. 20, 1961	Spring Vigor* May 28, 1962	Percent Winter Survival
Cayuga	2	3.0	37
Cornell 3	1.5	1.5	48
NK9-501	1.5	3.3	23
NK9-502	2	3.5	27
NK9-503	3	3.0	30
NK9-504	3	2.5	38
Narragansett	3	1.9	60
Vernal	3.5	1.0	50
DuPuits	1	3.2	22
Orchies	1.5	4.7	9
FD 100	1	2.7	29
Beaver	5	3.5	27
Tuna	3.5	3.2	40

* 1 - most vigor; 5 - least vigor.

Test will be discarded.

Yield and Winter Survival of Best Two Reps.

June 22, 1962

Variety	% Survival	Yield (D.M. per acre)
Cayuga	55	5336
Cornell 3	45	4714
NK9-501	40	4212
NK9-502	50	4622
NK9-503	40	4283
NK9-504	55	4995
Narragansett	75	5440
Vernal	60	5399
DuPuits	33	4486
Orchies	18	3718
FD 100	40	4064
Beaver	45	4457
Tuna	50	4360

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1962 Notes On 1958 Farm Plantings of Alfalfa Varieties

Less than one half of the alfalfa farm plantings made in 1958 still exist in the fall of 1962. Co-operators report that these plots are abandoned or plowed up in 12 out of 21 original locations.

Eight co-operators reported on performance up to 1962 of the varieties: DuPuits, Alfa, Grimm, Ranger, Rhizoma, Narragansett, Vernal, Vernal Viking (trefoil) mixture, Viking (trefoil). These varieties had been seeded in 1958 in one acre blocks adjacent to each other at each location.

Co-operators placed each variety in a category based on stand in 1962. The categories were over 50% stand of alfalfa, 25 to 49% alfalfa and less than 25% stand of alfalfa.

No. of reports assigning the variety to each category.

	DuPuits	Alfa	Grimm	Ranger	Rhizoma	Narragansett	Vernal	Vernal Viking
Over 50% stand of alfalfa	2	3	2	2	3	4	5	4
25% to 49% stand "	1	1	3	5	4	4	1	0
Less than 25% stand "	3	3	2	0	0	0	0	0

These reports indicate superiority of Vernal, and Narragansett in stand over a four year period. They also point toward a poor stand in DuPuits, Alfa and Grimm over the four years. Ranger and Rhizoma appear to be intermediate in stand in 1962.

To further indicate co-operators observations, a question was asked on persistence. When asked which varieties survived better than others under fair drainage, Vernal was named in four cases and Narragansett in three cases. The Viking mixture and the pure Viking were mentioned in three and two cases respectively. Co-operators indicated that DuPuits survived more poorly than other varieties in five cases. Alfa was placed in that category in four reports and Grimm in two reports. One co-operator mentioned Rhizoma as surviving less well than other varieties.

Another angle was covered by the question: Which plot do you feel has done the most for you under fair drainage? In answer, three reports checked Narragansett, and three checked Vernal. Two reports checked Vernal-Viking, while one checked each of Viking alone and DuPuits.

The observations of co-operators in the fourth harvest year point toward best performance from Vernal and Narragansett. Mediocre performance from Ranger and Rhizoma and poor performance from DuPuits, Alfa, and Grimm. This would suggest that the present recommendations for long term stands are justified and that Narragansett should also be considered for such situations.

The Viking trefoil is reported as having increased in stand in six out of seven reports. It is reported as better than the best alfalfa in survival under fair drainage conditions in three out of seven reports. It is reported equal to the best alfalfa in two out of seven reports. The stand of trefoil is reported at 80% or above in two cases, 70 to 79% in three reports, and poor in two reports.

Manure was applied in three of the seven locations reported in 1962.

Only one out of four co-operators reported cutting alfalfa in September.

Co-operators' comments in response to the statement: Make any comments here that you feel would help in evaluating the plots.

-
1. Alfa & DuPuits plots are thinning some but timothy is filling in to keep yield up.
 2. Plot 1 has always looked best and is staying on well. The plants are big and leafy, while Narragansett is very thick and inclined to be short. Vernal is good average for length and thickness. This has been a very interesting comparison.
 3. Grimm & Rhizoma are not producing maximum yields but rather than plow two plots we are leaving them as they are. DuPuits, Alfa, Narragansett, Vernal and Vernal-Viking plots produced at least 20 bales more per acre than the others.
 4. (Manitoulin) Rhizoma, Narragansett, Vernal, Vernal viking, Viking plots will be left another year.
 5. Over time seeded down, plots 1 and 2 out yielded all other plots for tonnage of hay. All plots were used exclusively for hay.

6. Alfalfa in the plots is nearly all gone. Trefoil is there but not providing any quantity of hay. Timothy is good. (Rainy River)
7. Grimm plot has been poorest all along; disappointed in DuPuits and Alfa. They did not stay in as well as expected. They could be useful for short term stands. Trefoil is increasing but still not producing enough.
8. Vernal is thinning slightly in low spots but Viking is not staying in much better than the alfalfa. This site is low in fertility and the trefoil has never done well.

Summary

Vernal and Narragansett are the varieties which performed the best in the fourth crop year.

Rhizoma and Ranger have been intermediate in performance.

Grimm has been the most poorly performing variety.

DuPuits and Alfa have performed poorly in the fourth crop year.

Viking performance has been improving over the four year period. It is not performing much, if any, better (as indicated by stand and persistence) than the best alfalfa varieties under fair drainage.

Yield of Viking has been low in comparison to the better alfalfa varieties.

RED CLOVER, 1961 SEEDING, GUELPH

TEST 572

1962 Yields in Lb. D.M. Per Acre

	Hay June 15	Aftermath July 27	1962 Total
LaSalle, east	4521	2862 ab	7383
LaSalle, west	4475	2643 bc	7118
Lakeland	4574	2636 c	7210
Dollard, foundation	4180	2657 bc	6837
Dollard, certified	4609	2766 abc	7375
Ottawa, breeders	4164	2659 bc	6823
Ottawa, bishops	4210	2543 c	6753
Chesapeake	4198	2892 a	7090
Mean	4365	2707	7072
L.S.D. 5%	N.S.	220	N.S.
C.V.	9%	7%	7%
English, Burgess +	4369	2458	6827
Tetraploid, Ottawa +	3801	2027	5828

+ not included in the analysis of variance.

Comments

1. Establishment - good except for Ottawa tetraploid. The stand of the latter strain was about 80-90% of that of the others.
2. Winter injury - practically none.
3. Order of maturity on the basis of flowering:
 - A. Ottawa Bishops, Burgess, Chesapeake.
 - B. Ottawa breeders, Lakeland, LaSalle west, Tetraploid, LaSalle east.
 - C. Dollard certified, Dollard foundation.

A - B = 3-5 days, B - C = 2-3 days.
4. Aftermath recovery followed the same order as for flowering.
5. By mid-August Ottawa Bishops and the English strain were showing some thinning.
6. By September 6, Chesapeake was showing a greater readiness to flower than other strains. Flower heads of all plots were clipped off.
7. October 10. Considerable flowering, and tops were again clipped back.
8. Burgess was showing considerable yellowing and thinning. Tetraploid was showing some signs of mildew, most of the others considerably less and Lakeland none at all.
9. During the fall Chesapeake showed considerable more growth than any of the others and as of October 20, was maintaining a good stand.

Among the four medium strains, LaSalle, Ottawa, Dollard, and Lakeland, grown here or elsewhere in southern Ontario, there appears to be no great amount of difference.

Chesapeake is earlier than the above four and has fewer plants still alive for the second harvest year.

In 1963, Ottawa and Dollard and LaSalle are to be recognized as distinct varieties.

WHITE CLOVER

TEST 574

A strain trial was successfully established on Range 11E. It contained thirteen entries, was seeded with Frode orchard grass and, in part, was designed to compare two Ottawa synthetics with other strains that are in common use. The entries are:

S 100	Granladino	Ottawa Syn. A
California	Pilgrim	Ottawa Syn. B
Kersey	Nordic	C.B. Pasture
New Zealand	Merit	C.B. Hay
Common		

Graded into three divisions according to vigor of growth

<u>Above Average</u>	<u>Average</u>	<u>Below Average</u>
Granladino	Syn. A	S 100
Pilgrim	Syn. B	New Zealand
California	Kersey	Common
	Nordic	C.B. Pasture
	Merit	C.B. Hay

BIRDSFOOT TREFOIL

TEST 562

In this test, begun in the winter of 1960-61 and terminated in the summer of 1962, 48 European type progeny lines were categorized according to the following three systems.

- (i) Seed weight - mg. per 100 seeds, 4 classes of 12 each
 - 1. 200 or above
 - 2. 184 - 189
 - 3. 167-172
 - 4. 150-155*

* Average for a random population is about 153 mg.
- (ii) Source
 - A. drawn from a family of high mean seed weight
 - B. other than A above.
- (iii) Greenhouse vigor
 - G - best available line within the seed weight and source limitations.
 - L - worst or least vigorous line within the a/m limitations.

These 48 lines plus a Viking check were seeded in rows in the field and were harvested twice in the seedling year, 1961, and three times in 1962.

Results

As recorded in the 1961 Progress Report differences in dry matter yield between seed weight groups were significant neither in Cut 1 or Cut 2 of the seedling year. On the other hand, the G - lines outyielded the L - lines by 11% in the first cut and by 3% in the second. Within seed weight groups within sources the differences between the G - and the L - lines were significant in 7 out of 8 classes, in Cut 1 and 4 in Cut 2. Differences between sources were small and non-significant.

First Crop Year, 1962

- 1. As in the seedling year, the differences between seed weight classes were not significant in any cut or in the season's total. In fact, the best group outyielded the second, the third, and the poorest by only 2%, 2%, and 3% in Cut 1, and by less in the other cuts.
- 2. The mean of the G - lines in all three cuts differed from that of the L - lines by less than 1%.
- 3. The mean yield of source A lines differed from that of source B lines by 1-3% depending on the cut.

Comments and Discussion

- 1. The superiority in yielding ability exhibited by the G - lines was quite pronounced in the first cut of the seedling year, much less so in the second cut and had disappeared completely in the following year.

2. Good yielding lines were found in 1962 in all four seed weight groups, in both source groups and both in the lines that performed well in the greenhouse and in those that performed poorly. None of the three criteria investigated, viz. seed weight, seedling vigour, or source, proved to have any value in identifying progenies that developed into high yielding lines as mature plants in the field.
3. Within this small group of only 48 lines the range in yield was extensive. The best yielding line in Cut 1 exceeded the mean by 25%, that in cut 2 by 12%, in Cut 3 by 12% and in the season's total by 15%. To secure 10 clones for a synthetic that would outyield the mean by the same amount would presumably require the testing in the field of 500 lines. A greenhouse technique that would identify these high yielding lines would permit the screening of much larger numbers in a much shorter time. No such technique is known at the present time.
4. The results of this experiment serve to confirm the conclusion reached on previous experiments, namely, that from the standpoint of seedling vigour, there is no great advantage in selecting for extremely high seed weight, but rather, after the lines whose seed weights are below 150 mg/100 seeds are discarded further selection must be made on the basis of greenhouse performance.

BIRDSFOOT TREFOIL

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1962 Notes on Progress of 1961 Plantings
 Extension Branch, Soils and Crops Branch, O.A.C.,
 Soil and Crop Improvement Associations Co-operating

Project No. 2

Plot 1
 Empire trefoil and
 Climax timothy

Plot 2
 Vernal alfalfa, Empire
 trefoil and Climax
 timothy

Plot 3
 Empire and Viking
 trefoil and Climax
 timothy

Reports on 24 locations were obtained for 1962. Of these, only two reported the plots to be plowed up this year, while another two co-operators reported that they had planned to do so but had been advised not to.

Of the 20 others, only two co-operators were not satisfied with the stand of forage on the plots. Fewer co-operators were satisfied with the first year production. Six were dissatisfied with production from the Empire Vernal mixture. To look at the other side of the picture, though, about three quarters of the co-operators were satisfied with even the Empire production and about 90% were satisfied with the stand on all plots. In only a few locations (3 out of 20) was trefoil vigour rated as poor.

Plant stands showed that most of the locations (13 out of 16) had over six plants per foot in the Empire plot. In the Empire Viking plot the same situation existed. However in the Empire Vernal plot 8 out of 17 locations were reported to have less than six plants of Empire per square foot. Seven out of the seventeen locations had less than six alfalfa plants per square foot. Thus, plant stands in the majority of locations could be considered satisfactory for the pure trefoil mixtures. When alfalfa was included the stands were lower in more locations but still acceptable.

Only six co-operators reported applying manure and a like number applied fertilizer after September, 1961.

While one co-operator delayed haying until August on these plots, six began haying in July and eleven proceeded to harvest in June.

* * *

Co-operators' Comments

1. The trefoil in Vernal-Viking plot did not show up very much when cut for hay but has thickened up considerably as aftermath. As a matter of preference, I prefer the combination of the two trefoils and timothy over the others. While not quite as much bulk as the alfalfa plots, the trefoils are thicker and the hay very fine.

On all three plots some areas are very thick and some very thin patches. I believe this is a result of some smothering from the grain that went down so the plant counts are not too accurate, but all plots are thickening and showing new plants, since the hay was cut.

2. There is not much difference between the Empire plot and the Viking-Empire plot. However, the Viking-Vernal plot shows a dominant stand of alfalfa with a good growth of trefoil in the bottom. The trefoil has been very slow to establish with some complete killing where the oats went down.

The birdsfoot trefoil is very fine with some very small plants. The timothy is very thick with a slight yellow-green colour.

3. The Viking-Empire plot has much thicker trefoil and looks very promising for future pasture. This pasture was eaten down fairly close but seems to be coming back very well. The Empire plot is being pastured now and there is a few more days pasturing. The Viking-Vernal plot hasn't been pastured since July 27. Alfalfa averages 21 inches high. Trefoil and timothy average 12 inches high with a very good stand.

4. Of the three plots, Viking-Vernal is the best and farthest advanced. Hay was so much below normal this year around here that it is as good as could be expected.

The plot series as a whole - the stand is very good but was very short this year and the second cut is very short - half the height of red clover.

5. There were more weeds than usual on the field this year.
6. The yield was better on Empire. We figure this is because of the soil that was spread out from the clearing of the irrigation ditch.
7. You can't see the ground on the Plot No. 1 as there are so many trefoil blossoms. Plot 2 has a fair stand of hay for another year. Trefoil and alfalfa are only in spots. With time, they may all come fair, but I couldn't say as to what may fill in.
8. The plots are all on new cleaned up low land. The fertility is quite high so I haven't fertilized since seeding. The trefoil did very good right through and is a thick stand.

The Vernal-Viking plot is the best because it is slightly higher and has the alfalfa in it to increase the yield.

9. The Viking trefoil plot is by far the best. It is much thicker and grows faster and taller than the Empire. After taking the first cutting for hay I pastured 24 cows 10 days on the aftermath. Since then it has been very dry with not much growth.
10. Due to very dry conditions all plots are doing fair.
11. Due to the wet weather which we have experienced this year in contrast to the dryness of last year, it was practically impossible to do anything on this field before the mentioned cutting date without damaging the sod too much. The field has been cut in one piece after consultation with the agricultural representative as 60 - 90% of the crop consisted of our native red clover which seems to have had the right growing conditions this year. Even though the trefoil is there, most of the plants are still small and it remains to be seen if it can compete in the long run with the clover. At the present time I find the trefoil looking quite well but on close examination, young clover plants in the 1-3 leaf stage by the millions, it seems. In comparison to this terrific mass of clover, the trefoil does not seem to be enough to make any comparisons or evaluations.
12. I am favourably impressed in the performance of Viking trefoil which made almost as good a recovery after cutting as alfalfa in spite of the dry year.

The bales of first cut hay weighed about the same so I did not weigh them, but the trefoil bales were much lighter on second cut with no change in bales adjustment. Trefoil makes nice fine easy cutting hay.
13. I have a check plot of Vernal alfalfa and Saratoga brome grass which produced much more than the trefoil plots this year.

The stand of plants could be thicker but it will likely thicken up next year.
14. This field with the three types of trefoil have done no good for me this far. Fall of 1961 showed hardly anything but weeds. This spring the stand still looked poor, and I was ready to put the plow to it. However, the agricultural representative advised me to hang on and spray for weeds. Towards the end of May the field looked fairly good. The cows pastured off it and right after that I manured the whole field on a good rainy day. About two weeks later (14th of June) I had a custom sprayer in to spray with 2,4D-B 64.

Dry weather followed. All the weeds were killed in no time and the thistles but the trefoil had a tremendous setback, so I never got any more off the field since. Just lately, it seemed to recover so it might be alright after all. So far this field cost me more than I got out of it and this does not please me at all.
15. the Vernal-Viking mixture has not quite the density on the ground as noted in Empire or the Empire-Viking plots.

As a whole, the plot series has provided excellent pasture and has recuperated quickly after a month of dry weather during July and August.

16. Empire and Empire-Viking plots looked like good stands but did not yield nearly as well as Vernal-Viking. However, we had a very very dry summer in this immediate area. Cows seem to like trefoil, and ate it bare before touching the alfalfa.
17. These plots are quite weedy. I was going to plow them up, but our assistant agricultural representative advised leaving them for a while to see if the trefoil would stand out.
18. The Empire and Empire-Viking are slow starting plots compared to Plot 2 with the alfalfa. I like the alfalfa as it gives you a little better production for the first year.
19. The Viking-Empire and timothy plot does not appear to be as strong as the rest.

It gives good pasture and the cattle do not show any preference to any plot that one can see. We were late starting to pasture this field due to work being done to the road fence so the timothy was a little coarse. We have also had a soil sample taken and the reply was: fertility levels good as is. No fertilizer needed.

20. Plot No. 1 has the poorest drainage and Plot No. 3 has the best drainage. All plots have low wet spots. The low spots have the most plants per square foot.

The timothy is hard to find in all plots. The trefoil had good germination but does not grow as fast as the alfalfa.

* * *

Exp. 211Timothy Variety Test, 1958Yield and Digestibility of Forage, 1961

Variety	Cut July 5		Cut July 10	
	Yield	% Digestible	Yield	% Digestible
Climax	5950	59.6	5980	61.8
Drummond - 2nd	5510	62.7	5320	58.2
Essex - 5A	5450	64.5	5320	60.8
S-48 - 2nd	3860	60.6	3600	70.8
Mean Square for Varieties	**	N.S.	**	N.S.

Comments: Two samples of each variety were evaluated for digestibility by Dr. J.E. Winch in the Artificial Rumen Lab., Crop Science Department, O.A.C., Guelph.

The yield data have been previously reported. Differences among varieties in digestibility were non-significant. The C.V. for the analysis of variance of digestibility was 5.8%.

Exp. 617Timothy Variety Trial, 1961(Yield in lb. of Dry Matter/acre)

Variety*	Cut 1	Cut 2	Total
Climax	5870	1910	7780
O-233	5870	1700	7570
Essex	5800	1550	7350
WT 41	5530	1740	7270
Drummond	5850	1370	7220
S-51	4680	1800	6480
Mean Square for Varieties	**	N.S.	**

The purpose of this trial is to evaluate WT 41 and O-233 as possible replacements for Climax. Both appear equal to Climax.

Most of the variation contained in the variety mean square in the A.N.O.V. can be attributed to the inferior performance of S-51.

A total of 33 varieties and strains of timothy were evaluated in replicated row plantings seeded in 1959 and 1960. The purpose of these plantings was to select those entries with sufficient merit to warrant further intensive testing. The data are summarized in the two accompanying tables.

On the basis of these data, the following entries were selected for further evaluation and will be included in a 1963 screening trial:

Ank. No. 2299
Barenza Hay
Favor
Kampe II
Melle Hay

Omnia
Sv. 0857F₁
Sv. 0857F₄
Weibull's⁴T-59

All of these entries are similar to Climax in vigor and maturity.

Exp. 604Timothy Variety Observation Nursery, 1959Summary of 1960, '61 and '62 Data

Varieties	Origin	May 1-7	Vigour ¹⁾		June 23 ²⁾	Height at Bloom
			June 1			
						(inches)
<u>Early</u>						
Kampe II	Sweden	3.0	3.0		2.0	37
Scottish	Scotland	2.5	2.5		3.0	38
<u>Medium</u>						
Barenza Hay	Netherlands	3.0	3.5		3.5	36
C.B.	"	3.5	4.0		2.5	33
Climax	Canada	3.0	3.0		2.0	36
Drummond	"	3.5	3.5		1.5	35
Favor		3.0	3.5		3.0	35
Medon	Canada	2.5	3.0		1.5	37
Melle Hay	Belgium	3.0	3.0		2.0	36
Omnia	Sweden	3.0	3.5		3.0	35
Vanadis	Sweden	3.5	3.5		3.5	37
<u>Late</u>						
King	Netherlands	3.5	5.0		3.0	32
S-48	Wales	4.0	4.0		1.0	33
S-51	"	3.5	4.5		3.0	34
<u>Very Late</u>						
Barbantia Pas.		3.0	5.0		3.0	--
Barenza Pasture	Netherlands	3.5	4.5		4.0	29
Heidemiz	"	3.5	5.0		2.5	--
Melle Pasture	Belgium	4.0	5.0		3.5	--

Exp. 612Timothy Variety Observation Nursery, 1960Summary of '61 and '62 Data

Maturity	Variety	Vigour ¹⁾		Height at Bloom (inches)
		June 1	July 10 ²⁾	
<u>Early</u>	Ank. No. 2299	3.0	3.3	38
	Kampe II	3.0	3.5	38
<u>Medium</u>	Barenza Hay	3.2	3.8	39
	Climax	3.0	2.5	40
	Medon	3.2	1.8	39
	Sv. 0857F ₁	3.0	2.8	36
	" F ₂	3.2	2.0	36
	" F ₃	3.5	2.8	35
	" F ₄	3.0	3.2	37
	" F ₅	3.2	2.0	34
	Sv. 0858	3.5	3.5	37
	Sv. 0863	3.2	2.8	36
	Sv. 0865	3.2	2.2	38
	W.T-41	3.5	2.5	36
	W.T-59	3.5	2.0	35
<u>Late</u>	C.B.	4.0	2.5	34
	Essex	3.2	2.2	38
	W. T-40	3.8	1.5	37

(1) All vigour ratings are from 1 (good) to 5 (poor).

(2) Aftermath rating on pasture section of row.

Summary of Timothy Varieties

Tested at O.A.C.
since 1952.

Variety	Origin	Tested for Yield	Comments
Barbantia P.	Holland		Late. Low spring vigour.
Barenza H.	"		Climax maturity. <u>Need</u> <u>further testing.</u> Broad leaves.
Barenza P.	"		Late. Lacks vigour.
C.B.	"		Late. Low spring vigour.
Clair	Kentucky	✓	Similar to Climax. Being tes- ted.
Climax	C.E.F.	✓	
Drummond	Macdonald College	✓	Similar to Climax.
Essex	New York	✓	Late. Low yield.
Favor			
Hopkins	W. Virginia	✓	Early. May be of value. Slightly lower in yield than Climax.
Heidemijs	Holland		Late. Lacks spring vigour.
Itasca		✓	Equal to Climax in yield.
Kampe II	Sweden		Earlier than Climax. Need further testing.
King			Later than Climax. Lacks spring vigour.
Lorraine		✓	
Marietta	Ohio	✓	Lower yielding than Climax.
Medon	O.A.C.	✓	Equal to Climax in yield.
Melle H	Belgium		Similar to Climax.
			Similar to Climax. <u>Need</u> <u>further testing.</u>
Melle P	"		Late. Lacks spring vigour.
Milton		✓	Equal to Climax in yield.
			Lower in leafiness.
Omnia	Sweden		Similar to Climax. <u>Need</u> <u>further testing.</u>
S-48	Wales	✓	Late. Low yield.
S-50	"	✓	Low yield.
S-51	"	✓	Late. Low yield.
Scottish	Scotland	✓	Early. Similar to Climax in vigour.
Vanadis	Sweden		Early. May be of value.
W. T-40	"		Late. Similar to Essex.
W. T-41	"	✓	Similar to Climax. Being tested for yield.
W. T-48	"	✓	Similar to Climax. Being tested for yield.
W. T-59	"		Similar to Climax. May be of value.

Exp. 628Timothy Radiation Nursery, 1962

A small timothy nursery was established in 1962. The aim of this planting is to assess the value of radiation in a timothy breeding program. Seed of the varieties Climax and Medon were irradiated by the Chemistry Department, O.A.C. in April 1962.

Three different levels of radiation were used: namely, 2,000 r, 5,000 r, and 10,000 r. Work done by Dr. B.E. Murray, C.E.F., Ottawa indicated that 5,000 r would be the optimum level. One seed sample of each variety was exposed to each level of radiation.

Immediately after treatment, the seeds were germinated in petri dishes and once germinated, were planted in flats in the greenhouse. For the untreated check and the lowest levels of radiation (2,000 r and 5,000 r) 200 plants were started in the greenhouse without difficulty. The seeds which had received 10,000 r produced normal coleoptiles but root growth was extremely slow. The germination of these two samples decreased rapidly with time, and the decrease was greater in Medon than in Climax.

All plants of the checks and the two lowest radiation treatments plus the surviving plants of the highest radiation treatment were transplanted to the field in July and were well established by fall.

Exp. 602 - Provincial Orchardgrass Test, 1959

Data were collected from this trial in 1960 and 1961, and the experiment was terminated in the spring of 1962. The varieties were seeded with Vernal and DuPuits alfalfa, but the alfalfa failed to establish. Stands of the orchardgrass were excellent, however.

During the winter of 1960-61, part of the third and fourth replications suffered some winter damage. This was most severe in the plots of Trifolium 1631 and S-143.

In determining the composition of the forage, samples were divided into three components, as follows:

1. Vegetative - all stems without visible heads
2. Reproductive - stems with a visible head. This portion of the sample was then divided into leaf and stem.

This type of separation has been continued in subsequent studies. In this experiment, separation into these three components brought out the following points with regard to varieties:

1. Sterling has a very low percentage of vegetative material. This is a very early variety, but was high in yield of dry matter.
2. Latar was equal to S-143 in actual per cent leaf. This variety is later than Frode, and has very thick stems. Data from the U.S.A. indicates that it is low in lignin. There is some evidence that it is very productive in the first harvest year but that its production is much less in subsequent years. Our data confirms this result.

On the basis of data collected from this trial at Guelph, Ottawa and Ridgetown, the following changes in varietal recommendations were made:

1. Tardus II was proposed for licensing and placed on the recommended list (November, 1961).
2. S-143 was removed from the recommended list (November, 1962).
3. Ottawa 200 (Rideau) was proposed for licensing and will be recommended for use in Ontario when seed is available (November, 1962).

Treatment	Variety	Cut. 1			Aftermath (3 cuts)			Seasonal Production		
		1960	1961	Mean	1960	1961	Mean	1960	1961	Mean
Silage (Cut June 8, 1960; June 13, 1961)	Sterling	4,960	3,920	4,440	4,460	4,390	4,430	9,420	8,310	8,870
	Danish	5,040	3,190	4,120	4,190	4,090	4,140	9,230	7,280	8,260
	Tardus II	4,810	2,990	3,900	4,450	4,000	4,220	9,260	6,990	8,120
	Ottawa 200	4,250	3,280	3,760	4,300	4,050	4,180	8,550	7,320	7,940
	Hercules	4,270	3,210	3,740	4,450	3,740	4,100	8,720	6,960	7,840
	Frode	4,610	2,820	3,720	4,290	4,090	4,190	8,890	6,910	7,910
	Latar	4,810	2,590	3,700	4,180	3,820	4,000	8,990	6,410	7,700
	Trifolium 1631	4,430	2,010	3,220	4,310	4,310	4,310	8,750	6,310	7,530
	S-143	3,560	1,470	2,520	4,110	4,100	4,110	7,670	5,580	6,630
	L.S.D. 5%	570	560					790	280	
	1%	760	750					1,060	380	
Hay (Cut June 16, 1960; June 21, 1961)	Tardus II	5,520	5,080	5,300	3,850	3,660	3,760	9,370	8,740	9,060
	Sterling	5,820	3,660	4,740	4,400	3,780	4,090	10,220	7,440	8,830
	Ottawa 200	4,860	4,800	4,830	4,000	3,820	3,910	8,860	8,620	8,740
	Latar	5,600	3,900	4,750	4,050	3,760	3,900	9,650	7,660	8,650
	Frode	5,230	3,740	4,480	4,410	3,920	4,160	9,640	7,660	8,640
	Danish	5,610	3,610	4,610	4,290	3,740	4,020	9,900	7,350	8,630
	Hercules	5,180	3,640	4,410	4,020	3,740	3,880	9,200	7,380	8,290
	Trifolium 1631	5,060	3,680	4,370	4,120	3,590	3,860	9,180	7,270	8,230
	S-143	4,120	3,180	3,650	3,890	3,740	3,820	8,010	6,920	7,470
	L.S.D. 5%	830	N.S.					930	N.S.	
	1%	1,110						1,240		

Provincial Orchardgrass Test, 1959 (Cont'd)
Summary, 1960, 1961

		Comp. of Grass				% Protein of Components										
Treatment	Variety	% Veg.			% Leaf		Veg. Shoots			Leaves			Stems			
		'60	'61	M.	'60	'61	M.	'60	'61	Mean	'60	'61	Mean	'60	'61	M.
Haylage (Cut June 8, 1960, June 13, 1961.)	Sterling	29	15	22	19	16	18	15.6	11.6	13.6	20.5	14.8	17.6	10.0	6.9	8.4
	Danish	37	22	30	21	16	18	15.4	11.1	13.2	21.3	15.2	18.2	9.3	6.9	8.2
	Tardus II	49	39	44	21	19	20	14.8	12.4	13.6	20.1	15.1	17.6	8.6	7.0	7.8
	Ottawa 200	56	44	50	27	25	26	15.5	12.0	13.8	20.5	15.4	18.0	7.8	7.2	7.5
	Hercules	50	27	38	21	17	19	15.2	11.7	13.4	19.4	15.0	17.2	8.7	7.2	8.0
	Frode	54	38	46	23	21	22	15.0	12.0	13.5	19.4	14.5	17.0	8.4	7.3	7.8
	Latar	55	44	50	30	26	28	16.4	11.9	14.2	20.6	15.9	18.2	8.4	7.9	8.2
	Trifolium 1631	56	60	58	24	26	25	15.0	13.0	14.0	20.7	16.8	18.8	9.6	8.1	8.8
	S-143	82	52	67	30	28	29	15.7	17.1	16.4	19.7	19.5	19.6	8.3	9.1	8.7
	L.S.D. 5%	11	11		3	2		N.S.			1.6			1.0		
1%	15	15		4	2					2.2			1.4			
Hay (Cut June 16, 1960, June 2, 1961.)	Tardus II	40	31	36	15	14	14	13.7	11.3	12.5	18.5	13.2	15.8	8.8	6.4	7.6
	Sterling	28	33	30	13	15	14	14.8	10.7	12.8	18.3	12.7	15.6	8.9	6.4	7.6
	Ottawa 200	53	34	44	18	18	18	14.0	11.3	12.6	18.7	14.1	16.4	7.8	6.9	7.4
	Latar	44	33	38	21	17	19	14.7	10.6	12.6	19.8	13.8	16.8	8.0	6.6	7.3
	Frode	39	45	42	16	22	19	14.2	12.0	13.1	18.8	13.6	16.2	7.8	6.6	7.2
	Danish	34	33	34	14	14	14	14.9	10.9	12.9	19.1	12.9	16.0	8.8	6.3	7.6
	Hercules	40	31	36	15	15	15	14.6	10.9	12.8	19.3	12.9	16.1	8.6	6.4	7.5
	Trifolium 1631	52	34	43	15	17	16	14.0	9.8	11.9	17.5	11.9	14.7	8.6	5.8	7.2
	S-143	75	48	62	19	17	18	14.5	11.4	13.0	18.9	13.0	16.0	9.1	6.2	7.6
	L.S.D. 5%	9			2			N.S.			N.S.			0.8		
1%	12			2	NS								1.1			

Exp. 602

Provincial Orchardgrass Test, 1959

Management: Pasture (5 cuts,
1960, 4 cuts, 1961)

Summary of 1960 & 1961 Data

Variety	May	June		July		August		Autumn		Season Total		
	1960	June 8 1960	June 2 1961	July 6 1960	June 26 1961	Aug 10 1960	Aug. 3 1961	Oct. 4 1960	Sept 15 1961	1960	1961	Mean
Danish	2,660	1,770	1,940	990	930	2,450	2,160	610	1,270	8,480	6,290	7,380
Frode	2,270	2,100	1,810	980	1,040	2,470	2,220	660	1,220	8,480	6,280	7,380
Pennlate	2,370	1,880	1,710	960	950	2,570	2,190	570	1,250	8,350	6,100	7,220
Latar	2,940	1,790	1,700	900	1,100	2,330	2,060	500	1,090	8,460	5,940	7,200
Hercules	2,250	1,900	1,720	1,000	980	2,540	2,080	550	1,180	8,230	5,960	7,100
Ottawa 200	2,350	2,210	1,500	950	1,150	2,340	1,950	380	1,070	8,230	5,680	6,960
Trifolium 1631	2,050	2,050	730	1,070	1,100	2,640	2,240	740	1,280	8,550	5,350	6,950
Tardus II	2,380	1,940	1,440	890	1,010	2,290	2,040	650	1,120	8,150	5,600	6,880
S-143	1,490	2,150	210	1,200	1,150	2,530	2,350	850	1,330	8,220	5,060	6,640
L.S.D. 5%	380	260	270	140	130	230	200	150	140	N.S.	150	
1%	500	350	360	190	180	310	260	200	180		200	

Provincial Orchardgrass Test, 1959

Exp. 602

Summary of 1960, 1961 Data

Treatment: Pasture

Yields of Dry Matter - Lbs. Per Acre

Variety	May	June	July	Aug.	Sept- Oct	Total
Danish	2,300	1,350	990	2,305	940	7,885
Frode	2,040	1,570	980	2,345	940	7,875
Pennlate	2,040	1,415	960	2,380	910	7,705
Latar	2,320	1,445	900	2,195	795	7,655
Hercules	1,980	1,440	1,000	2,310	865	7,595
Ottawa 200	1,920	1,680	950	2,145	725	7,420
Trifolium 1631	1,390	1,575	1,070	2,440	1,010	7,485
Tardus II	1,910	1,475	890	2,165	885	7,325
S-143	850	1,655	1,200	2,440	1,090	7,235

Five polycross progenies were seeded for Dr. W.R. Childers, C.E.F., Ottawa. These five appear similar in performance. Most of the significant differences among varieties is due to the difference between these five progenies and S-143.

It is interesting to note the decrease in the range in yield when grown with Ladino as compared to the pure stands. The mean square for strains x alone vs. with ladino was significant in the analysis of variance. This emphasizes the importance of testing grass strains with a legume.

Yield - lbs. of D.M./Acre							
Entries	ALONE			WITH LADINO			
	Cut 1 June 14	Cut 2 Aug. 17	Total	Cut 1	Cut 2	Total	
Polycross 5, No. 1	2,860	1,870	4,730	2,120	1,980	4,100	
" No. 2	2,500	1,980	4,480	2,190	2,210	4,400	
" No. 3	2,300	1,840	4,140	2,040	2,270	4,310	
" No. 5	2,570	1,830	4,400	2,080	2,050	4,130	
" No. 7	2,560	1,780	4,340	2,070	2,100	4,170	
S-143	1,700	2,030	3,730	1,760	1,970	3,730	
Forde (?)	1,740	2,150	3,890	1,770	2,110	3,880	
Mean Square for entries	**	N.S.	**	**	N.S.	**	

% Composition		
Entries	% Legume	
	Cut 1	Cut 2
Polycross 5, No. 1	50	50
No. 2	60	70
No. 3	60	50
No. 5	70	60
No. 7	55	50
S-143	80	75
Forde (?)	70	70

Exp. 621 - Ottawa Polycross Test, 1961Analyses of Variance

Source	D.F.	Mean Squares		
		Cut 1	Cut 2	Total
Replications	5	403,955	278,814	597,955
(A vs L) Alone vs. With Ladino	1	2,093,186**	630,240	213,144
Error (a)	5	125,959	266,080	208,136
Strains	6	1,095,626**	84,148	426,293**
Strains x A vs L	6	259,374**	100,644	100,083
Error (b)	<u>60</u>	84,926	45,594	62,554
Total	83			
Cuts	1			948,302*
Error (c)	5			84,814
Cuts x A vs L	1			2,510,282*
Error (d)	5			183,903
Cuts x Strains	6			876,007**
Cuts x Strains x A vs L	6			137,409
Error (e)	<u>60</u>			67,967
Total	167			

* Mean square significant at 5% level.

** Mean square significant at 1% level.

Exp. 620 - Orchardgrass Miscellaneous Strains, 1961

The lots of common orchardgrass were supplied by the Ontario Seed Cleaners and Dealers, Limited. The lot Danish Common #4 was of a pasture type, similar to S-143 in appearance.

Differences in yield of dry matter in the first cut were not as great as might be expected. These results are based upon only three replications, and, had sufficient seed been available to increase the replication, smaller differences might have been found significant.

The Re-selected Frode was sent to us as a later and leafier selection out of the original Frode. These data indicate that it is quite similar to the original.

Although there were large differences in the mean % leaf among the entries in this test, the variability from replication to replication was large. Consequently, the differences were found to be non-significant.

Of interest is the data on digestibility. These were determined on two occasions in our Artificial Rumen Lab., but differences were non-significant. The range in digestibility among the entries was of the order of 5-6%. In these two analyses of variance the C.V.'s were 5%.

Considering the eight lots of common orchardgrass:

1. In total yield, one lot was superior to Frode and Tardus II, and one, inferior.
2. In maturity, four were earlier, and one, later than Frode and Tardus II.

Exp. 620

Orchardgrass Miscellaneous Strains, 1961

Location - Guelph

Strain	Yield of Dry Matter/Acre, 1962		
	Cut 1(1)	Cut 2(2)	Total
American Common #1	4,250 a	1,820 ab	6,070 a
" " #2	4,140 a	1,810 ab	5,960 ab
" " #4	3,970 ab	1,890 a	5,860 abc
Motycka	3,990 a	1,850 ab	5,840 abc
Tardus II	3,680 abc	1,860 ab	5,540 bcd
Frode	3,770 abc	1,730 ab	5,500 bcd
Danish Common #1	3,670 abc	1,700 ab	5,370 cd
Re-Selected Frode	3,470 abc	1,730 ab	5,200 d
Danish Common #2	3,510 abc	1,640 ab	5,150 d
American Common #3	3,490 abc	1,660 ab	5,150 d
Danish Common #3	3,410 abc	1,650 ab	5,060 d
" " #4	2,990 c	1,600 bc	4,590 e
Masshardy	3,020 bc	1,400 c	4,420 e

1) Cut 1 taken June 21, 1962.

2) Cut 2 taken Aug. 16, 1962.

3) Any two means without the same letter are significantly different (5% level).

Cut 1, 1962 Analysis

Strain	Yield	No. Heads/ Sq. Foot	% 1) Vegetative	% 2) Leaf	% Diges- tibility ²⁾	Relative Maturity
American Common #1	4,250 a	28 ³⁾	63 bc	68	a 5) b 5)	E ⁴⁾
" " #2	4,140 a	20	52 c	58	57.8 58.1	E
Motycka	3,990 a	14	84 a	86	62.9 60.3	
American Common #4	3,970 ab	24	63 bc	69	56.7 60.2	E
Frode	3,770 abc	20	69 b	73	60.4 61.5	
Tardus II	3,680 abc	16	69 b	73	61.4 61.8	
Danish Common #1	3,670 abc	16	60 bc	66	59.4 59.8	
" " #2	3,510 abc	24	51 c	58	58.1 58.7	
American Common #3	3,490 abc	24	58 bc	64	61.1 62.8	
Re-Selected Frode	3,470 abc	12	68 b	73	59.5 60.1	
Danish Common #3	3,410 abc	28	64 bc	69	59.6 58.4	E
Masshardy	3,021 bc	12	71 b	78	62.6 61.4	L
Danish Common #4	2,990 c	6	87 a	89	61.8 61.6	L

1) All shoots without visible heads classed as vegetative.

2) Differences in % leaf and % digestible were non-significant.

3) Visual estimate.

4) E = earlier than Frode; L = later than Frode; remainder, same maturity as Frode.

5) Digestibility was determined from 2 samples per replication on Oct. 10 and Nov. 7/62.

Note: 1) This test was grown on a dry site and consequently, only two cuttings were obtained.

2) In September, 1961, Masshardy was infected with leaf rust (20%), while remainder of entries showed little or no infection.

Exp. 603 and 611 - Orchardgrass Variety Rows

A total of 68 varieties and strains have been evaluated in row plantings. The purpose of these plantings was to select those entries which would merit further testing.

On the basis of these two trials, the following varieties have been chosen for further evaluation:

1. Coxa
2. Heidemij
3. No. 0276
4. No. 0278
5. Sceempter
6. Sv. 01009
7. Weibull's H-11
8. Weibull's H-16

These were chosen on the basis of their vigour ratings and maturity. All are similar to Frode in maturity.

Group-Variety	Vigour May 1	Pasture Treatment			Hay Treatment		
		Vigour May 30	Vigour June 20	Vigour July 30	Vigour June 1	Height at Bloom	Vigour Aug. 1
	(1-5)*	(1-5)	(1-5)	(1-5)	(1-5)	(inches)	(1-5)
<u>Early</u> (Bloom June 10-15)							
Avon	2.0	1.0	3.0	3.0	1.0	42	3.0
Danish	2.0	2.5	3.0	3.0	2.5	40	3.0
Eagle Hill	3.0	3.0	2.5	3.0	3.5	42	3.0
Japanese Local	2.5	2.0	2.5	3.0	2.5	40	2.5
Kentucky Syn.	2.0	1.5	2.5	2.5	1.5	40	3.0
Oron	2.0	2.0	2.5	3.5	2.0	41	3.0
Penn. Early	2.0	2.0	3.0	3.0	2.5	42	3.0
Potomac	1.5	1.5	2.5	3.0	1.5	43	3.0
Sterling	2.5	1.5	3.0	3.0	1.5	40	2.5
Trifolium							
Extra Early	2.5	3.5	3.0	3.0	3.0	40	3.0
Wisc. 52	2.5	1.5	2.5	3.5	2.0	42	3.0
<u>Medium</u> (Bloom June 16-21)							
Akaroa	3.0	3.5	3.0	2.0	3.0	38	3.0
Coxa	2.5	3.0	3.0	2.5	3.0	42	3.0
Dorise	2.5	4.0	2.5	3.5	3.5	40	3.5
Esquire I	4.0	5.0	3.5	3.5	5.0	38	3.5
Esquire II	4.0	4.5	3.0	3.5	4.5	38	3.0
Frode	3.0	3.0	2.5	3.0	3.0	41	3.0
Glasnevin	3.0	5.0	3.5	2.5	4.5	40	3.0
Hammenhogs	2.5	3.0	2.5	2.5	3.5	42	3.0
Hercules	2.0	2.5	2.0	4.0	2.5	42	2.5
Mommersteeg's	3.0	4.0	2.0	4.0	4.0	42	3.0
Penn. Medium	2.5	3.0	2.5	2.0	3.0	41	2.5
Roskilde II	2.5	3.5	3.0	3.0	4.0	40	3.0
Tardus II	3.0	3.0	3.0	3.0	3.5	41	2.5
Trifolium All	2.5	3.5	3.5	4.0	4.0	42	3.0
Utah Syn. 2	2.5	3.0	2.0	4.0	3.5	42	3.0
<u>Late</u> (Bloom June 22-27)							
Barenza	3.0	4.0	3.0	3.0	4.0	36	3.0
Grasslands	4.0	5.0	4.0	4.0	5.0	40	3.5
Latar	2.0	3.5	2.0	4.5	2.5	44	2.0
Ottawa 200	3.0	3.5	3.0	3.5	4.0	42	3.0
Polycross	3.0	3.5	3.0	3.5	4.0	42	3.0
S-26	4.0	5.0	3.5	4.0	5.0	38	3.5
S-37	3.0	4.0	3.0	3.5	3.0	42	3.0
Trifolium 1631	3.0	4.5	2.5	3.5	4.5	40	3.0
<u>Very Late</u> (Bloom June 29-)							
Aurora	3.0	3.5	1.5	3.5	3.0	43	2.5
Barbantia	3.0	4.0	2.5	4.0	4.0	38	3.0
S-143	5.0	5.0	4.0	5.0	5.0	--	3.5

* All vigour ratings are from 1 (good) to 5 (poor).

Variety	Origin	Heading	Bloom	Height	Vigour Ratings 1)			
		Date 1962	Date 1961	at Bloom 1961	May 1	May 31	June 15	Aug 1
			(June)	(inches)				
Chinook	Alberta	May 27	14	36	2.0	1.0	2.0	3.0
Avon	Quebec	" 27	14	36	3.0	1.0	2.0	3.0
Dorise	Netherlands	" 31	19	34	3.0	3.0	3.0	3.0
Trifolium								
Ex. Early	Denmark	" 31	19	36	2.5	2.0	2.0	3.0
-0276		" 31	19	36	3.0	2.0	2.0	3.0
-0278		" 31	19	38	3.0	2.0	2.0	3.0
G-1867	Netherlands	June 1	19	35	2.5	3.0	2.0	2.5
G-1873	"	June 2	19	35	3.0	3.0	2.5	3.0
G-1878	"	June 2	19	35	2.0	2.5	2.5	2.5
G-1966	Sweden	June 2	19	33	3.0	2.5	2.0	3.0
Tardus II	"	June 2	19	35	3.0	2.5	2.0	3.0
Heidemij	Netherland	June 4	19	34	3.0	3.5	2.5	3.0
-0277		" 4	19	33	3.5	4.0	3.0	3.0
Sceempter	Netherlands	" 5	19	33	3.0	3.5	2.5	3.0
Barenza	"	" 7	19	34	3.0	3.0	2.5	3.0
G-1871	Netherlands	" 2	20	34	3.0	3.5	3.0	3.0
G-1872	"	" 4	22	30	4.0	3.5	4.0	3.0
G-1874	"	" 4	22	37	2.0	2.0	2.0	3.0
G-1868	Netherlands	June 2	23	34	3.0	4.0	3.5	3.0
G-1880	"	" 5	23	39	3.0	3.5	3.0	3.0
G-1963	Sweden	" 5	23	35	4.0	4.5	3.5	3.0
C.B.	Netherlands	" 8	23	34	4.0	4.0	4.0	3.0
G-1869	Netherlands	" 8	23	34	3.0	4.0	3.5	3.0
G-1870	"	" 8	23	35	3.0	4.0	3.5	4.0
Monmersteeg's	"	" 8	23	36	3.0	4.0	3.5	3.0
G-1875	Netherlands	June 5	27	33	3.0	4.0	3.0	3.0
Introduction	Quebec	" 8	27	33	4.0	4.0	3.5	3.0
Ottawa 200	C.E.F.	" 8	27	38	3.0	3.5	3.0	3.0
G-1876	Netherlands	" 9	27	36	2.5	4.0	3.5	3.0
G-1879	"	" 9	27	36	4.0	4.5	3.0	3.0
G-1964	Sweden	" 9	27	40	3.0	3.0	2.5	3.0
G-1965	"	" 9	27	34	4.0	4.5	4.0	3.0
Ottawa 100	C.E.F.	" 9	27	33	3.5	4.5	3.0	3.0
S-143	Wales	" 9	27	34	4.5	5.0	4.0	3.0
W.H. 11	Sweden	" 9	27	38	3.5	3.5	3.0	3.0
W.H. 16	"	" 9	27	37	3.0	3.5	3.0	3.0
G-1877	Netherlands	June 4	—	—	4.0	4.0	3.5	3.0

1) All vigour ratings are from 1 (good) to 5 (poor).

STATUS OF ORCHARDGRASS VARIETIES IN ONTARIO

This listing provides an indication of desirability of all orchardgrass varieties tested at O.A.C. during the 1953-61 period.

Desirability ratings are given according to a scale. (1-5).

- 1 - Varieties recommended for Ontario
- 2 - Varieties meriting further testing
- 3 - Varieties which may merit further testing as opportunity arises
- 4 - Varieties which appear unsuitable for Ontario.
- 5 - Varieties unsuitable for Ontario.

Orchardgrass Varieties Tested at O.A.C. Since 1953

<u>Maturity</u>	<u>Variety</u>	<u>Origin</u>	<u>Tested for Yield (1953-'61)</u>	<u>Desira- bility</u>	<u>Comments</u>
Early (Bloom June 10-15)	Avon	Macdonald C.		4	Variable } Stemmy } Probably to early for Ont.
	Chinook	Alberta		3	
	Danish	Denmark	✓	5	
	Eagle Hill	Denmark		3	
	Japanese Local	Japan		3	
	Kentucky Syn.	Kentucky		3	
	Masshardy	Mass.	✓	3	
	Oron	O.A.C.	✓	5	
	Penn. Early	Penn.		4	
	Patomac	Maryland	✓	5	
	Sterling	Iowa	✓	4	
	Trifolium Extra early	Denmark		2	
	Wisc. 52	Wisconsin	✓	5	
Medium (Bloom June 16- 21)	Akaroa	N. Zealand	✓	4	Pasture Type
	Coxa	Sweden		2	
	Dorise	Netherlands		4	Pasture Type
	Esquire I			4	" "
	Esquire II			4	" "
	Frode	Sweden	✓	1	
	Garton's 337	England	✓	4	
	Glasnevin	Eire		4	Pasture Type
	H-2	U.S.D.A.	✓	3	
	Hammenhogs	Sweden		3	
	Heidemý	Netherlands		3	
	Hercules	C.E.F.	✓	4	
	Mammersteeg's	Netherlands		4	Pasture Type
	Motycka	Poland	✓	3	
	O-233	Oregon	✓	5	Low Yield
	Otofte Late II	Denmark	✓	4	
	Penn. Medium	Penn.		4	
	Raskilde II	Denmark		4	
	Sceempter	Netherlands		3	
	Scotia	Scotland	✓	5	Stemmy
	Tamminsto	Finland	✓	4	
	Tardus II	Sweden	✓	1	
	Trifolium All	Denmark		4	
	Utah Syn. 2	Utah		4	

<u>Maturity</u>	<u>Variety</u>	<u>Origin</u>	Tested for <u>Yield</u> (1953-'61)	<u>Desirability</u>	<u>Comments</u>
Late (Bloom June 22-27)	Barenza	Netherlands		4	Pasture Type
	C.B.	"	✓	5	Lacking in vigour
	Grasslands	N. Zealand	✓	5	" " "
	Latar	Washington	✓	2	
	O.A.C. Polycross	O.A.C.		4	
	Ottawa 200	C.E.F.	✓	1	
	Pennlate	Penn.	✓	2	
	S-26	Wales	✓	5	Low Yield
	S-37	Wales	✓	5	Low Yield
	Trifolium 1631	Denmark	✓	4	Pasture Type
Very Late (Bloom - June 29-)	Aurora	N. York	✓	4	
	Barbantia			4	Pasture Type
	Ottawa 100	C.E.F.	✓	4	
	S-143	Wales		5	Low yield winter- kills.
	Weibull's H11	Sweden	✓	3	
	Weibull's H16	Sweden		3	

In 1961, open-pollinated seed of 33 S-55- selections were seeded at the end of range B-4. The original clones have been lost, but they were selected for leafiness and varying maturities, from an orchardgrass nursery in the former A section of our ranges, near the water tower.

The seed samples were planted in rows 15' long, 1 row per sample. These rows were assessed visually during 1961. Nine superior samples were noted on the basis of vigor, leafiness and height. Four of these were later than the variety Frode, and five were approximately of the same maturity.

There were three outstanding selections:

S-55-26) same maturity as Frode
S-55-27)

S-55-38 later maturing than Frode

Since there is no remnant seed, portions of the row of each of these three selections were removed and the material separated into individual tillers. An isolated recombination block for each selection has been established for seed increase.

The remaining selections will be re-evaluated in 1963.

Orchardgrass - Local Collections and Introductions

In 1960, 55 collections of orchardgrass seed were made from roadsides and fields which appeared to have been established for some time. These were made in the counties of Oxford, Simcoe and Bruce. These collections were seeded in rows on the end of Range B-3 in 1961, along with 22 introductions obtained from U.S.D.A., Plant Introduction Station, Ames, Iowa. The variety, Frode, was included in this test as a check. The rows were evaluated visually, relative to Frode and the results are summarized in the accompanying table.

Both of these sources of material seem to have potential for the isolation of superior germ plasm. The introductions exhibit more variability from sample to sample than do the local collections.

Performance of Local Collections and Introductions of Orchardgrass

Character	Ratings	No. of Entries	
		Local Collections	Introductions
1. Fall Vigour (Oct. 16/61)	1) 1	0	0
	2	0	5
	3*	26	11
	4	27	5
	5	2	1
<hr/>			
2. Hay Vigour (May 30/62)	1) 1	23	10
	2*	30	4
	3	2	5
	4	0	1
	5	0	2
<hr/>			
3. Desirability (May 30/62)	2) 1	0	0
	2	2	1
	3	5	2
	4	10	5
	5*	19	4
	6	7	2
	7	5	2
	8	6	3
	9	1	3
<hr/>			
4. Maturity	3) E	11	3
	M*	32	6
	M-L	7	5
	L	5	8

1) Rating from 1 (good) to 5 (poor).

2) Rating from 1 (most desirable) to 9 (least desirable).

3) E = early; M = medium; M-L = medium late; L = late.

*, Denotes the class containing the check, Frode.

Seedling year yield data of this study were reported in the 1960 report, and first harvest year data were reported in the 1961 report. In 1962 only the mixtures containing Vernal alfalfa were harvested. The DuPuits alfalfa mixtures were not harvested because of the large amount of winterkilling of DuPuits, particularly under the hay management, and the small amount of grass in the mixtures. Yields in 1962 were lower than in 1961 primarily because of the dry weather. Some variability was introduced into the test because of ununiform drought conditions over the test.

In this test the pasture management was cut immediately prior to bud stage. (Some buds could be found in the plots.) This tends to make pasture yields somewhat higher than under normal harvesting conditions. The hay plots were harvested at approximately 1/10 bloom of the alfalfa.

The alfalfa-orchard mixture was significantly lower yielding than the other mixtures. This is due to the much larger amount of grass in the mixture. The mixture would probably have responded to nitrogen since there was a nitrogen shortage indicated. In the fall of 1961, 300 lbs. of 5-20-20 was applied broadcast. Saratoga continues to show the most competitive ability of the brome grass varieties in mixtures with Vernal alfalfa and Lincoln the least competitive ability. It is pointed out that the 1962 data is dependent to some extent on the previous year's data.

The significant interaction of entries x management is due largely to the better competitive ability of some grasses under hay management than under pasture management. It is also of interest to note that the pure alfalfa or mixtures with little grass in them tended to give the highest total yield.

SUMMARY OF THE YIELD DATA FROM THE BROME-ALFALFA COMPETITION STUDY - GUELPH - 1960
(TEST 217)

Variety	Yield Legume Component (lbs./acre D.M.)				Yield Grass Component (lbs./acre D.M.)				Yield Legume + Grass (lbs./acre D.M.)			
	Cut 1	Cut 2	Cut 3	Season Total	Cut 1	Cut 2	Cut 3	Season Total	Cut 1	Cut 2	Cut 3	Season Total
<u>Pasture Management</u>	<u>May 28</u>	<u>Jul.10</u>	<u>Aug.14</u>		<u>May 28</u>	<u>Jul.10</u>	<u>Aug.14</u>		<u>May 28</u>	<u>Jul.10</u>	<u>Aug.14</u>	
Vernal +												
Can.Common	3135	2830	1724	7689	556	177	106	849	3737	3006	1830	8573
Lincoln	3333	3018	1869	8220	315	25	6	346	3725	3042	1875	8642
Saratoga	2731	2369	1586	6686	1270	402	218	1890	3972	2715	1804	8551
Climax	2877	2817	1700	7394	1072	259	53	1384	3995	3076	1753	8824
Frode	1665	1844	1251	4760	1328	506	402	2236	2993	2350	1654	6997
Alfalfa alone	3454	3097	1789	8340	74	6	28	108	3587	3102	1816	8505
Mean Pasture	2865	2662	1653	7180	771	229	136	1136	3668	2892	1789	8349
<u>Hay Management</u>	<u>Jun. 7</u>	<u>Aug. 2</u>	<u>Oct. 1</u>		<u>Jun. 7</u>	<u>Aug. 2</u>	<u>Oct. 1</u>		<u>Jun. 7</u>	<u>Aug. 2</u>	<u>Oct. 1</u>	
Vernal +												
Can. Common	1927	2313	1492	5732	2049	582	234	2865	3976	2895	1726	8597
Lincoln	2612	3165	1608	7385	1324	196	59	1579	3792	3366	1666	8824
Saratoga	1357	2134	1312	4803	2694	703	343	3740	4095	2837	1655	8587
Climax	2567	2968	1716	7251	1392	190	55	1637	3958	3168	1770	8916
Frode	1024	1371	949	3344	1709	709	605	3023	2732	2081	1554	6367
Alfalfa alone	3063	3336	1689	8088	752	208	45	1005	3815	3544	1734	9093
Mean Hay	2091	2548	1461	6100	1653	431	223	2307	3728	2982	1682	8394
Mean Hay + Pasture	2478	2605	1557	6640	1212	330	179	1721	3696	2937	1737	8370
L.S.D.												
Management 5%	555	N.S.	113	N.S.	397	90	83	474	N.S.	N.S.	174	N.S.
1%	868	N.S.	177	N.S.	623	141	N.S.	743	N.S.	N.S.	272	N.S.
Entries 5%	419	283	172	739	313	107	74	818	493	228	79	741
1%	559	378	230	986	418	143	98	1091	658	305	105	988
Entries + Man. 5%	N.S.	401	N.S.	N.S.	443	151	N.S.	N.S.	N.S.	161	N.S.	1048
1%	N.S.	534	N.S.	N.S.	591	202	N.S.	N.S.	N.S.	323	N.S.	1397
C.V. %	20.6	13.3	13.3	13.6	31.6	39.5	50.1	58.4	16.3	9.5	5.6	10.8

MEAN YIELDS (D.M. LB./ACRE) OF THE GRASS VARIETIES OVER THE TWO SYSTEMS OF MANAGEMENT
IN THE BROME-ALFALFA COMPETITION STUDY - 1960 (TEST 217)

Variety	Legume Component				Grass Component				Legume + Grass			
	Cut 1	Cut 2	Cut 3	Season Total	Cut 1	Cut 2	Cut 3	Season Total	Cut 1	Cut 2	Cut 3	Season Total
Can. Common	2531	2572	1608	6711	1308	380	170	1858	3857	2951	1778	8586
Lincoln	2973	3092	1739	7804	820	111	33	964	3749	3204	1771	8724
Saratoga	2044	2252	1449	5745	1982	553	281	2816	4034	2806	1730	8570
Climax	2722	2893	1708	7323	1232	225	54	1511	3977	3122	1762	8861
Frode	1345	1608	1100	4053	1519	608	504	2631	2863	2216	1604	6683
Alfalfa alone	3259	3217	1739	8215	413	107	37	557	3701	3323	1775	8799

MEAN PERCENT GRASS IN THE MIXTURE IN 1962 FOR TEST 217

	Percent Grass in Mixture		
	Cut 1	Cut 2	Cut 3
<u>Pasture Management</u>			
Vernal + Common	15.4	6.4	6.1
Lincoln	8.7	0.9	0.3
Saratoga	31.6	14.7	12.0
Climax	27.0	8.8	3.4
Frode	45.1	23.1	24.8
Alone	2.1	0.2	1.5
Mean of Pasture	21.7	9.0	8.0
<u>Hay Management</u>			
Vernal + Common	52.0	20.1	13.1
Lincoln	34.6	5.9	3.5
Saratoga	66.0	25.4	20.4
Climax	35.2	6.4	3.1
Frode	62.5	35.7	38.8
Alone	20.4	6.3	2.8
Mean of Hay	45.1	16.7	13.6
Mean of Cut	33.4	12.8	10.8

ESTIMATED STAND* OF LEGUME AND GRASS IN SPRING 1962 FOR TEST 217

	Legume		Grass	
	Vernal	DuPuits**	Vernal	DuPuits
<u>Pasture</u>				
Common	4.0	4.0	1.7	0.1
Lincoln	4.0	4.0	1.3	0.1
Saratoga	3.7	4.0	3.1	0.3
Climax	4.0	4.0	2.7	0.3
Frode	3.1	3.3	5.0	4.5
Alone	3.7	3.5	0.0	0.3
<u>Hay</u>				
Common	2.9	2.0	3.1	0.3
Lincoln	3.0	2.7	2.3	0.5
Saratoga	2.7	2.0	3.5	0.7
Climax	3.0	2.1	2.9	0.5
Frode	1.7	1.3	4.1	4.0
Alone	2.7	1.7	0.9	0.1

* 1 = approx. 2 plants/sq. ft.; 3 = approx. 10 plants/sq.ft.; 5 = approx. 20 plants/sq.ft.

** considerable winterkilling of DuPuits alfalfa particularly under hay management

BROME SYNTHETIC TEST, GUELPH - 1960 (TEST 218)

This test is previously outlined and reported in the 1960 and 1961 reports. The brome varieties headed out in the latter part of May and early part of June. The first cut made prior to anthesis. The second cut was primarily leafy material with very few heads present. The fertilization program consisted of 70 lbs. per acre of nitrogen in early spring prior to growth initiation with an additional 50 lbs./acre of nitrogen after the first cut. In addition, 50 lbs/acre of potassium was applied after the first cut.

Leaf disease was not serious although Carlton and Common did show the greatest infection particularly in the second growth.

Sac, which was formerly reported as Wisc. B81, was named and released by the Wisconsin Experiment Station in the fall of 1962. Breeder's seed of this variety will be "maintained" as an advanced generation according to the Wisconsin Station.

Ottawa Syn. C continues to yield comparable to Saratoga. Per cent leaf data are not reported for those strains which appear to have no further potential.

BROME SYNTHETIC TEST - 1960 (TEST 218)

Variety	Yield D.M. lbs./acre			Percent Leaf	Percent Stem	Yield	
	Cut 1 (June 7)	Cut 2 (Aug.3)	Total			D.M. lbs./acre	
						Leaf	Stem
Cut 1							
S-5054	4068	1664	5732				
Carlton	4066	1892	5958	37.7	62.3	1466	2424
S-4535	4570	1598	6168				
S-4092	4806	1819	6625				
Sac (Wisc. B81)	5131	1915	7046	33.0	67.0	1636	3322
Wisc. B63	4989	1877	6866				
Wisc. B55	5300	2009	7309				
Common	4328	1740	6068	33.5	66.5	1360	2699
Lincoln	5142	1825	6967	32.1	67.9	1597	3383
Saratoga	5551	2265	7816	33.4	66.6	1826	3642
Ottawa Syn. C	5433	2334	7767	30.3	69.6	1602	3662
Ottawa Syn. B	5217	2258	7475	30.1	69.9	1556	3607
Mean	4883	1933	6816	32.9	67.1	1577	3156
C.V. %	6.4	11.9	6.7	6.0	3.0	7.1	5.5
L.S.D. @ 5%	361	262	527	3.5	3.5	200	310
L.S.D. @ 1%	628	455	702	5.0	5.0	280	434

BROME SYNTHETIC TEST - 1961 (TEST 223)

This test was outlined in the 1961 report. It is a test of some Saskatoon and Guelph synthetics, in pure stand, to obtain information on their potential. The Guelph synthetics were included to give some check on the level of selection practised and obtained in the breeding program. The fertilization program consisted of 70 lbs./acre of nitrogen in the early spring and 50 lbs./acre of nitrogen after the first cut. In the previous fall 300 lbs./acre of 0-20-20 had been applied. The first cut was made approximately two weeks after heading but prior to anthesis. No differences were noted in the heading date of the synthetics. No other data were observed on the test.

	Yield in lbs./acre D.M. in 1962			Relative vigor in seedling year (Jul.12)
	Cut 1 (June 8)	Cut 2 (Aug. 7)	Seasonal Total	
Saratoga	5021	2517	7538	1.0
Lincoln	5227	2220	7447	4.0
Canada Common	4167	2010	6176	3.5
S-5563	4120	2164	6284	4.0
S-6213	4593	2304	6896	2.5
S-6214	4792	2249	7041	2.0
G-2252	5189	2225	7413	1.5
G-2253	5045	2423	7468	2.0
Mean	4769	2264	7033	
L.S.D. for Varieties				
.05	262	N.S.	355	
.01	482	N.S.	483	
C.V. (%)	3.7	10.3	3.4	

UNIFORM BROME VARIETY TEST - 1961 (TEST 224)

This test of brome varieties planted in mixture with Vernal alfalfa was planted at three locations - Guelph, Ridgetown and Kemptville. It is outlined in the 1961 report. In all tests a good stand of brome was obtained in the mixture. The stand of brome varied quite markedly depending on the competitiveness of the brome variety. This differential stand of the brome varieties is reflected in the yields in that the mixture yields are different than the grass component yields. The data from these tests continue to impress the necessity to test grass varieties under mixed stand conditions.

The percent grass in the mixture was not determined in the Kemptville test, while at Ridgetown the percent grass was estimated and, at Guelph, hand separations were made of a two pound sample from each plot. The percent grass data continue to show the strong competitiveness of Saratoga and the rather weak competitiveness of Lincoln brome.

The data were not analyzed over locations at this time.

UNIFORM BROME VARIETY TEST - GUELPH - 1961 (TEST 224)

Yields of the Brome-alfalfa Mixture in lbs./acre of D.M. in 1962

Variety	Cut 1	Cut 2	Cut 3	Seasonal Total
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PASTURE MANAGEMENT

	<u>May 25</u>	<u>July 13</u>	<u>Aug. 24</u>	
Saratoga	3662	2467	2358	8486
Lincoln	3396	2631	2433	8461
Manchar	3588	2215	2196	7998
Can. Common	3239	2364	2336	7939
Wisc. B55	3559	2294	2288	8142
Wisc. B81 (Sac)	3552	2445	2367	8364
Carlton	3419	2501	2419	8339
Mean	3488	2417	2342	8255

HAY MANAGEMENT

	<u>Jun. 14</u>	<u>Aug. 2</u>	<u>Oct. 2</u>	
Saratoga	5251	2721	1667	9639
Lincoln	4991	2557	1645	9194
Manchar	4984	2412	1536	8931
Can. Common	4840	2597	1564	9002
Wisc. B55	4921	2459	1595	8975
Wisc. B81 (Sac)	4990	2329	1470	8789
Carlton	4825	2631	1745	9221
Mean	4972	2532	1603	9107
Mean Hay + Pasture	4230	2475	1973	8677
L.S.D.				
Management .05	270	N.S.	375	796
.01	423	N.S.	592	N.S.
Grasses .05	226	N.S.	N.S.	N.S.
.01	N.S.	N.S.	N.S.	N.S.
Grasses x Manag. .05	320	N.S.	N.S.	N.S.
.01	N.S.	N.S.	N.S.	N.S.
C.V. (%)	6.6	13.7	11.7	8.0

Average Yield of the mixtures over the two systems of management

Saratoga	4457	2594	2013	9063
Lincoln	4194	2594	2039	8828
Manchar	4286	2314	1866	9465
Can. Common	4040	2481	1950	8471
Wisc. B55	4240	2377	1942	2559
Sac (Wisc. B81)	4271	2387	1919	8580
Carlton	4122	2576	2082	8780

Yields of Grass Components in lbs./acre of dry matter in 1962

	Cut 1	Cut 2	Cut 3	Seasonal Total
PASTURE MANAGEMENT				
	<u>May 25</u>	<u>July 13</u>	<u>Aug. 24</u>	
Saratoga	1986	7021	573	3261
Lincoln	1163	344	169	1676
Manchar	1862	786	553	3200
Can. Common	1015	444	357	1815
Wisc. B55	1206	367	207	1779
Wisc. B81 (Sac)	1403	421	267	2091
Carlton	1386	518	402	2305
Mean	1431	512	361	2304
HAY MANAGEMENT				
	<u>Jun. 14</u>	<u>Aug. 2</u>	<u>Oct. 2</u>	
Saratoga	2868	545	245	3658
Lincoln	1942	291	152	2385
Manchar	2571	729	231	3530
Can. Common	1986	486	119	2591
Wisc. B55	2131	300	158	2589
Wisc. B81 (Sac)	1938	377	184	2500
Carlton	1538	446	129	2113
Mean	2139	453	174	2766
Mean Hay + Past.	1785	482	268	2535
L.S.D.				
Management .05	N.S.	N.S.	146.7	N.S.
.01	N.S.	N.S.	N.S.	N.S.
Grasses .05	392	88	827	477
.01	521	117	1100	N.S.
Grass x Manag. .05	N.S.	N.S.	117.0	N.S.
.01	N.S.	N.S.	155.6	N.S.
C.V. (%)	27.9	22.4	37.9	23.0
Average yield of grass component over the two systems of management				
Saratoga	2427	624	409	3596
Lincoln	1553	318	161	2031
Manchar	2217	758	392	3365
Can. Common	1501	465	238	2203
Wisc. B55	1669	334	183	2184
Sac (Wisc. B81)	2462	399	226	2296
Carlton	1785	482	317	2209

Yields of Alfalfa Component in lbs./acre dry matter in 1962

	Cut 1	Cut 2	Cut 3	Seasonal Total
PASTURE MANAGEMENT				
	May 25	July 13	Aug. 24	
Saratoga	1683	1777	1785	5245
Lincoln	2234	2288	2152	6673
Manchar	1726	1430	1643	4799
Can. Common	2224	1966	1979	6109
Wisc. B55	2354	1871	2082	6306
Wisc. B81 (Sac)	2149	2024	2141	6314
Carlton	2033	1983	2018	6034
Mean	2058	1905	1971	5934
HAY MANAGEMENT				
	June 14	Aug. 2	Oct. 2	
Saratoga	2383	2129	1422	5934
Lincoln	3049	2272	1493	6814
Manchar	2413	1746	1305	5464
Can. Common	2854	2111	1446	6411
Wisc. B55	2790	2134	1437	6362
Wisc. B81 (Sac)	3052	2002	1286	6339
Carlton	3287	2242	1616	7146
Mean	2833	2091	1429	6353
Mean Hay + Pasture	2445	1988	1700	6143
L.S.D. Management .05	645	N.S.	399	N.S.
.01	N.S.	N.S.	N.S.	N.S.
Grasses .05	94	194	N.S.	2176
.01	125	258	N.S.	2894
Grass x Management .05	133	N.S.	N.S.	N.S.
.01	177	N.S.	N.S.	N.S.
C.V. %	4.7	12.0	16.2	13.7
Average yield of alfalfa component over the two systems of management				
Saratoga	2033	1953	1604	5590
Lincoln	2642	2280	1823	6744
Manchar	2070	1588	1474	5132
Can. Common	2539	2039	1713	6290
Wisc. B55	2572	2003	1755	6334
Sac (Wisc. B81)	2660	2112	1817	6327
Carlton	2446	1998	1700	6590

Percent Grass in Mixture in 1962

Variety	Cut 1	Cut 2	Cut 3
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PASTURE MANAGEMENT

	<u>May 25</u>	<u>July 13</u>	<u>Aug. 24</u>
Saratoga	54.2	28.5	24.3
Lincoln	34.2	13.1	6.9
Manchar	52.3	35.6	30.0
Can. Common	31.3	18.1	14.8
Wisc. B55	33.9	14.7	8.7
Wisc. B81 (Sac)	39.5	16.3	11.3
Carlton	40.6	20.6	16.6
Mean	40.9	21.0	16.1

HAY MANAGEMENT

	<u>June 14</u>	<u>Aug. 2</u>	<u>Oct. 2</u>
Saratoga	54.4	23.1	16.0
Lincoln	38.6	11.9	9.6
Manchar	51.0	31.2	15.1
Can. Common	40.0	19.7	8.2
Wisc. B55	42.9	13.4	11.1
Wisc. B81 (Sac)	38.3	16.1	13.1
Carlton	31.7	18.3	8.2
Mean	42.4	19.1	11.6
Mean Hay + Pasture	41.6	20.0	13.8
L.S.D. Management .05	N.S.	N.S.	N.S.
.01	N.S.	N.S.	N.S.
Grasses .05	6.5	2.2	3.2
.01	8.6	4.3	4.2
Grass x Manag. .05	N.S.	N.S.	4.5
.01	N.S.	N.S.	5.9
C.V. %	19.1	25.9	27.9

Average Percent Grass in Mixture over the two Systems of Management

Saratoga	54.3	25.8	20.2
Lincoln	36.4	17.5	8.3
Manchar	51.7	33.4	24.1
Can. Common	35.7	18.9	11.5
Wisc. B55	38.4	19.1	9.9
Sac (Wisc. B81)	33.9	16.2	12.2
Carlton	36.2	19.5	12.4

Percent Alfalfa in Mixture in 1962

Variety	Cut 1	Cut 2	Cut 3
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PASTURE MANAGEMENT

	<u>May 25</u>	<u>July 13</u>	<u>Aug. 24</u>
Saratoga	45.9	71.5	75.7
Lincoln	65.8	86.9	93.2
Manchar	47.7	64.5	70.0
Can. Common	68.7	81.9	85.2
Wisc. B55	66.1	85.3	91.3
Wisc. B81 (Sac)	60.5	83.7	88.7
Carlton	59.3	79.4	83.4
Mean	59.1	79.0	83.9

HAY MANAGEMENT

	<u>June 14</u>	<u>Aug. 2</u>	<u>Oct. 2</u>
Saratoga	45.6	76.9	84.0
Lincoln	61.4	88.1	90.4
Manchar	49.0	68.9	84.9
Can. Common	60.0	80.3	92.0
Wisc. B55	57.2	86.7	89.0
Wisc. B81 (Sac)	60.5	84.0	86.9
Carlton	68.3	81.7	92.0
Mean	57.4	80.9	88.4
Mean Hay + Pasture	58.3	80.0	86.2
L.S.D. Management .05	N.S.	N.S.	N.S.
.01	N.S.	N.S.	N.S.
Grasses .05	N.S.	5.0	2.7
.01	N.S.	6.6	3.6
Grass x Manag. .05	N.S.	N.S.	4.7
.01	N.S.	N.S.	6.3
C.V. (%)	101.3	7.6	4.8

Average Percent Alfalfa in Mixture over the two Management Systems

Saratoga	45.8	74.2	79.9
Lincoln	63.6	87.5	91.8
Manchar	48.4	66.7	77.5
Can. Common	64.4	81.1	88.6
Wisc. B55	61.7	86.0	90.2
Wisc. B81 (Sac)	60.5	83.9	87.8
Carlton	63.8	80.6	87.6

Yields of the brome-alfalfa mixtures in lbs./acre of D.M. in 1962

	Cut 1	Cut 2	Cut 3	Seasonal Total
PASTURE MANAGEMENT				
	<u>May 29</u>	<u>Not rec.</u>	<u>Aug. 29</u>	
Carlton	2283	1722	2189	6195
Lincoln	2734	1290	1578	5602
Can. Common	2291	1558	1977	5825
Saratoga	2695	1698	1919	6312
Wisconsin B81 (Sac)	2898	1550	1900	6348
Wisconsin B55	2547	1528	1994	6069
Manchar	2482	1763	2087	6332
Mean	2561	1587	1949	6098
HAY MANAGEMENT				
	<u>Jun. 15</u>	<u>Sept. 13</u>		
Carlton	4411	2314	----	6725
Lincoln	5057	2153	----	7210
Canada Common	4255	1897	----	6152
Saratoga	4668	2065	----	6733
Wisconsin B81 (Sac)	4954	2221	----	7174
Wisconsin B55	4621	2178	----	6798
Manchar	4419	2165	----	6584
Mean	4626	2142	----	6768
Mean Hay + Pasture	3594	1864		6433
L.S.D. Management .05	345	N.S.	----	617
.01	541	N.S.	----	N.S.
Varieties .05	281	N.S.	285	N.S.
.01	374	N.S.	383	N.S.
Var. x Manag. .05	N.S.	N.S.	----	N.S.
.01	N.S.	N.S.	----	N.S.
C.V. %	9.6	17.9	12.4	9.9
Average yield of the mixtures over the two management systems				
Carlton	3347	2018	----	6460
Lincoln	3896	1722	----	6406
Canada Common	3273	1728	----	5989
Saratoga	3682	1882	----	6523
Wisconsin B81 (Sac)	3962	1885	----	6761
Wisconsin B55	3584	1853	----	6434
Manchar	3451	1964	----	6458

UNIFORM BROME VARIETY TRIAL 1961 - RIDGETOWN

Western Ontario Agricultural School (A.D. McLaren)

Variety	D.M. Yield in lbs./acre				Percent Grass in Mixture		
	Cut 1	Cut 2	Cut 3	Season Total	Cut 1	Cut 2	Cut 3
PASTURE MANAGEMENT							
	<u>May 18</u>	<u>Jun.22</u>	<u>Aug.16</u>				
Saratoga	3517	2282	2734	8533	47	44	27
Lincoln	3654	2476	2941	9071	43	21	22
Manchar	3192	2180	2544	7916	42	48	40
Common	3082	2479	2785	8346	34	35	30
Wisc. B55	3359	2341	2966	8666	45	37	37
Sac (Wisc. B81)	3396	2334	2885	8615	35	37	23
Carlton	2920	2440	2712	8072	32	40	33
L.S.D. @ 5%	337	202	N.S.				
@ 1%	455	N.S.	N.S.				
HAY MANAGEMENT							
	<u>June 7</u>	<u>Aug.16</u>					
Saratoga	5988	3117		9105	36	53	
Lincoln	5875	2836		8711	31	57	
Manchar	5690	2842		8532	43	56	
Common	4922	2418		7340	28	61	
Wisc. 55	5808	3008		8816	39	52	
Sac	5826	3121		8947	27	52	
Carlton	5495	3207		8702	27	50	
L.S.D. @ 5%	404	468					
@ 1%	545	N.S.					

AVERAGE YIELD (lbs./acre D.M.) OF THE BROME-ALFALFA MIXTURE
OVER THE THREE LOCATIONS

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	<u>Yield</u>			Season
	Cut 1	Cut 2	Cut 3	Total
PASTURE MANAGEMENT				
Saratoga	3154	2157	2427	7738
Lincoln	3261	2132	2317	7711
Manchar	3024	1984	2239	7246
Common	3005	2180	2347	7532
Wisc. B55	3272	2062	2385	7719
Sac	3165	2102	2415	7683
Carlton	2940	2235	2406	7581
HAY MANAGEMENT				
Saratoga	5217	2717	1667**	8490
Lincoln	5308	2515	1645	8372
Manchar	4976	2384	1536	7872
Common	4810	2360	1564	7692
Wisc. B55	5228	2563	1595	8322
Sac	5146	2543	1470	8178
Carlton	4913	2674	1745	8169

** Date from Guelph location only

Average percent grass in brome-alfalfa mixture at Guelph and Ridgetown

PASTURE MANAGEMENT

Saratoga	50.6	31.3	20.7
Lincoln	38.6	27.1	14.5
Manchar	47.1	41.8	35.0
Common	32.7	26.6	22.4
Wisc. B55	39.5	25.9	17.9
Sac	37.3	24.2	17.2
Carlton	36.3	35.3	24.8

HAY MANAGEMENT

Saratoga	45.2	38.0
Lincoln	34.8	34.5
Manchar	47.0	43.6
Common	34.0	40.4
Wisc. B55	41.0	32.7
Sac	32.6	34.1
Carlton	29.4	34.2

(TEST 222)

This test is conducted in co-operation with Dr. R.P. Knowles of Saskatoon. The entries include the original seed lots of Fischer and Lincoln introduced from the Midwest and the subsequent first generation seed increase at two locations. The test was grown in pure stand broadcast plots. Fertilization program was the same for other pure stand brome tests.

Only first cut yield data were obtained. No differences in yield were found between the entries in the hay cut in 1961 and 1962. Aftermath recovery showed no apparent differences. No differences could be noted in other attributes such as heading date, leafiness, etc. This test will be discontinued.

DRY MATTER YIELDS (lbs./acre) IN PURE BROME STAND

	1961 (June 22)	1962 (June 7)	1961-1962 Average
Lincoln, Man. (S-5839)	6767	5020	5894
Lincoln, Sask.	6945	5053	5999
Lincoln, S-4981 (original)	6869	5090	5980
Fischer, Alepham Sask.	6814	5144	5979
Fischer, Iowa (original)	6828	5078	5953
Fischer, Zealandia, Sask.	6649	5112	5881
L.S.D. 5%	N.S.	N.S.	
C.V. (%)	6.3	3.7	

(Tests 221, 225, 227)

A. Survey of Perennial Bromus Species 1960 (Test 221)

The entries in this test are listed with extensive data in the 1961 report. No data was obtained on this test in 1962. However, introductions of B. inermis G-1914 from Yugoslavia, and G-1917, G-1916, G-1915, From Russia, continued to perform well. They showed similar spring vigor and equal vigor at the hay stage to Saratoga.

G-1827, a selection of B. pumpellianus from Germany, also appeared of value in terms of general vigor and it also appeared to hold the leaf and leaf color better at the base of the plants.

G-1850, introduced under the name of B. ciliatus from New Hampshire, was again much later in heading date than the other entries. This entry may not be B. ciliatus.

B. Survey of Perennial Bromus Species 1961 (Test 225)

The most promising selection in this group of material was an introduction of B. inermis (G-2279) from the Ukraine received from Ottawa. It appeared to have excellent vigor and leafiness and showed only a trace of leaf spot disease. B. latiglumis (G-2288) is also of interest in this material due to its extreme late maturity. In the middle of July the heads were just at the "boot" stage of maturity. The data obtained from this single row nursery in 1962 are summarized in the accompanying table.

SUMMARY OF OBSERVATIONS MADE ON BROMUS INTRODUCTIONS JULY 13, 1962

(TEST 225)

Entry	G No.	Origin	Relative Yield ¹	Leafi- ness ¹	Leaf disease ¹	Remarks
Saratoga	2226		1	1	1	
B. ramosus	2263	Yugoslavia	5	5	1	mainly basal leaves; more recovery.
B. sp.	2264	"	4	4	1	very fine leaf.
B. sp.	2265	"	4	4	1	very fine leaf.
B. inermis	2266	Poland	1	1+	3	quite leafy - fine tillers
B. inermis	2267	Poland	2	1	3	
B. inermis	2269	U.S.S.R.	3	2	2	
B. inermis	2270	"	2	3	3	
B. inermis	2271	"	2	2	3	
B. inermis	2272	"	3	3	3	
B. inermis	2273	" "	2	3	3	
B. inermis	2274	"	2	3	2	
B. inermis	2275	"	2	3	3	
B. inermis	2276	"	1	2	2	recovery growth occurring
B. inermis	2277	"	2	2	3	
Saratoga	2226		1	1	1	
B. inermis	2278	U.S.S.R.	1	1+	1	looks good
B. inermis	2279	Ukraine	1	1+	1	excellent
B. inermis	2280	Leningrad	1	2	2	
B. inermis	2281	"	3	2	3	some regrowth occurring
B. inermis	2282	"	-	-	-	did not establish
B. inermis	2283	"	3	2	4	poor stand
B. inermis	2284	"	4	1+	2	few seed heads
Saratoga	2226	"	1	1	2	
B. inermis	2285	"	?	2	2	poor stand
B. inermis	2286	"	3	2	3	
B. inermis	2287	"	1	1	3	not bad from a leafiness aspect.
B. latiglumis	2288	East Lansing	2	1++	3	very late maturity - boot stage. Many dead leaves at base.
B. latiglumis	2289	U. Wisconsin	-	-	-	did not establish.
B. latiglumis	2290	S. Edwards	-	-	-	did not establish.

¹ 1 - best to 5 - poorest.

C. Survey of Perennial Bromus species 1962 (Test 227)

This group of material includes twelve introductions of B. inermis of Russian origin. They were obtained from the U.S.D.A. plant introduction station at Ames, Iowa.

The two selections of B. ornans were obtained from the Lethbridge Research Station and are reported to have reduced creeping habit and also greater and more rapid aftermath recovery. Both of the B. ornans selections indicated poor seedling vigor. Two of the Russian selections of B. inermis showed superior seedling vigor over Saratoga.

Each entry consists of one row only. The planting is located on B-8.

SEEDLING VIGOR JULY 13, 1962, OF SOME PERENNIAL BROMUS INTRODUCTIONS

(TEST 227)

<u>Entry</u>	<u>G. Number</u>	<u>Relative Seedling Vigor*</u>
B. ornans	2355	10
B. ornans	2356	9
B. inermis	2357	8
B. inermis	2358	7
B. inermis	2359	5
B. inermis	2360	5
B. inermis	2361	4
B. inermis	2362	1
B. inermis	2363	4
B. inermis	2364	6
B. inermis	2365	6
B. inermis	2366	3
B. inermis	2367	3
B. inermis	2368	1
Saratoga	2331	4

* 1 - best to 10 - poorest

These nurseries are outlined in the 1960 report. Seed was harvested from the nurseries in 1962. Seed yield was poor, particularly so for polycrosses 2 and 3. It is doubtful if the results for seed yield are of much value except when used in conjunction with additional data.

Seed weight data are satisfactory and agree with previously obtained information on seed weight of this material.

Entry	Seed yield in grams per plant			Seed weight* in gms./50 seeds		
	1A Brampton	1B Gamble	Mean	1A Brampton	1B Gamble	Mean
<u>POLYCROSS 1</u>						
21-1	48	35	41.5	.320	.303	.311
149-19	50	51	50.5	.314	.293	.303
145-9	29	44	36.5	.289	.276	.283
20-9	46	35	40.5	.293	.269	.281
126-7	70	52	61.0	.315	.306	.310
152-6	53	49	51.0	.295	.286	.290
36-16	42	30	36.0	.278	.262	.270
187-13	34	36	35.0	.289	.284	.286
133-2	41	32	36.5	.319	.292	.305
Mean	46	40	43.0	.301	.286	.293
P = .01	27	16.6		.032	.021	
C.V. (%)	45.8	32.7		8.4	6.0	
<u>POLYCROSS 2 (Location - DeVos)</u>			<u>Seed yield</u>	<u>Seed weight*</u>		
47-2		15		.238		
56-1		11		.225		
154-5		10		.282		
151-2		10		.224		
126-12		16		.256		
21-1		12		.321		
162-5		13		.294		
128-16		9		.219		
139-16		11		.268		
Mean		12		.259		
P = .01		N.S.		.030		
C.V. (%)		50		9.2		
<u>POLYCROSS 3 (Location - Brampton)</u>			<u>Seed yield</u>	<u>Seed weight*</u>		
88-14		20		.225		
36-16		25		.276		
152-6		30		.286		
21-1		28		.315		
47-2		18		.244		
20-9		27		.297		
162-5		36		.280		
149-19		37		.322		
26-17		30		.259		
Mean		28		.278		
P = .01		N.S.		.023		
C.V. (%)		47.7		6.1		

* two samples of 50 seeds per plot

PLOT UNIFORMITY STUDY ON PURE STAND BROME AND
ALFALFA-BROME MIXED STA D - 1961 (TESTS 232,
233)

A pure stand block of Saratoga brome and a mixed stand block of Saratoga brome and Vernal alfalfa were established in 1961. Stands in the spring of 1962 were good and the mixture was quite uniform. The material was harvested at the bloom stage in three by three feet plots. Approximately 450 of the basic units were harvested from each of the pure and mixed stands. In addition sampling was carried out for dry matter percent at harvest and for component determination of the mixed stand. The data have not been summarized at this time.

BROMEGRASS VARIETY TESTS SEEDED IN 1962

1. Brome Synthetic Test - 1962 (Test 226)

To evaluate six synthetics of brome grass in comparison with current varieties.

Location: D-17

Date of Seeding: April 27, 1962

Seeding Rate: 12 lbs./acre; pure stand of brome

Plot Size: 5' x 16½'

Design: Randomized complete block; 4 replicates

- Entries:
1. Sask. S-5824 (Syn.2) G-2354 - southern type synthetic from Saskatoon.
 2. Ott. Syn. B - G-2374 - southern type synthetic (14 clones) from Ottawa.
 3. Ott. Syn. C.- G-2375 - southern type synthetic (21 clones) from Ottawa.
 4. Ott. Syn. D - G-2376 - southern type synthetic made up of selected clones from Syn. C which have high seed set.
 5. R.P. 100 - G-2352
 6. R.P. 101 - G-2353
 7. Saratoga - G-2331
 8. Lincoln - G-2225
- } southern type synthetics submitted for testing by Rudy-Patrick Seed Co., Kansas City.
- } currently recommended varieties

120
34 Y62.2

BROMEGRASS

1962 Notes on 1960 Farm Planting
Extension Branch, Field Crops Branch, O.A.C.
and Soil and Crop Improvement Association
Co-operating

1962 Summary: Early Silage or Hay and Aftermath Pasture Demonstration.

Co-operators accept Saratoga as a good brome-grass while pointing out that early growth, vigour, and aftermath are not as high as orchardgrass. They indicate that orchardgrass may be too vigorous for even DuPuits. Winterkill of DuPuits was greater on the orchard plot. Saratoga brome was reported to be a good companion for DuPuits.

That most prefer the Saratoga brome-grass for hay is indicated by the comments on the quality of hay from it, compared to orchard-alfalfa hay.

The usual brome fault of poor establishment was indicated in a few reports but in general, this did not appear as a big problem. Maturity of Saratoga was preferred by some to that of orchardgrass.

Greater aftermath than available from Saratoga would appear to be desirable from the comments made by co-operators.

* * *

1962 Detailed Report

Thirty locations were seeded in 1960 with a mixture of DuPuits alfalfa and Saratoga brome grass to be compared with DuPuits alfalfa and Orchardgrass.

Reports on 18 locations were received on performance in 1962 - the second harvest year. Of these, seven co-operators will be plowing up the test in 1962 and at least one more will plow it up in early 1963.

Only six reported use of any fertilizer in 1961-2 while eleven reported applying manure. Only two applied neither manure nor fertilizer.

Eight reported grazing in September and October.

Alfalfa killing was more frequent on the orchard grass plot than on the Saratoga brome plot. Four reports showed over 50% winterkill of alfalfa while only one report showed such killing on the Saratoga plot. Both grasses survived winterkilling equally well and in all but one case ,

Eight reports showed orchard to exhibit most early spring vigour while five showed brome to have most spring vigour.

Alfalfa vigour was reported to be better in the brome plot than the orchard plot in three cases while orchard is reported to be crowding alfalfa out in two cases.

In every case the stand of orchard was equal to or higher than brome, the brome stand being lower in five cases.

Hay was cut in the first three weeks of June in all but three reports. The brome plots yielded more than orchard in four locations and less than orchard in three locations reported.

Seven co-operators indicated that orchardgrass was too vigorous for DuPuits alfalfa while four indicated neither grass to be too vigorous. DuPuits alfalfa was reported too vigorous for Saratoga brome in two reports and not too vigorous for either grass in five reports.

Saratoga was reported as being correct vigour for the DuPuits in seven cases while orchard was considered in this category in four reports.

While orchard was reported to give better regrowth than Saratoga in eight reports, the reverse was reported in one report.

Plots were pastured in September in six locations and not pastured in September in five locations.

1962 Co-operators' Comments

1. Saratoga brome didn't seem to be able to compete with DuPuits as well as orchardgrass did. It did make finer hay with cattle preferring it.
2. Saratoga is superior to other bromes - finer, more leaf, comes on faster. "Where alfalfa can be grown, there is a place for five to ten acres of DuPuits alfalfa and Saratoga brome. You can start hay harvest earlier and have earlier aftermath."
3. The plots were very much the same.
4. Orchardgrass far exceeds the brome in production and in rapid recovery.
5. Brome recovers too slow (in aftermath) for top yield. Saratoga appears to have good balance with DuPuits alfalfa, as well as palatability. Far more satisfactory in our particular soil condition than orchard. It is inclined towards coarseness (not objectionable as silage). Accepts fertility readily. I have used Saratoga and DuPuits for short term stands on rented land.
6. "Saratoga brome is preferred by cattle for pasture. The alfalfa is much stronger with Saratoga than with orchard. More feed is produced on the Saratoga and it is greener, more succulent than orchard. The orchard grass is drier and browner in colour and less appetizing. I like the Saratoga brome so well I am going to plant quite a lot in the future."
7. Brome bales dried out more leaving twine loose. Orchard did not. Orchard showed very fast growth but did not seem to stand dry weather as well as brome. Brome did not wilt in dry weather as much as orchard. The two years of testing have had unusually dry conditions after first cutting and have not yielded heavily. However, the stand is quite thick and should produce well next year.
8. Hay from brome alfalfa plot was rather coarse because no competition for alfalfa. From orchard alfalfa plot much finer - heavier yield - nicer hay. Saratoga brome in these plots has been useless in production to date in 1962. Orchard grew fine in first cutting, came up quickly in aftermath for about three weeks, then continued dry weather hit it and it collapsed on the ground while the alfalfa grew away from it. At the first rain orchard started again but was away behind until alfalfa was grazed off. At the end of July it showed very strong symptoms of boron deficiency but the first rain after this dry spell seemed to correct this situation.

From the two years experience on my farm, Saratoga brome grass will not stand up to DuPuits alfalfa sown at these rates because we had satisfactory germination and stand of brome in 1960.

Orchard, as sown, seems to be quite comparable and gives a nicer quality hay than straight alfalfa.

DuPuits alfalfa is excellent even in a dry year such as this. It produced twice as much second growth and half as much again first growth than Vernal

did in the same field side by side under the same management and fertilizer programme.

Also, the Vernal showed about 25% kill out last winter while DuPuits showed none even while on some more poorly drained land than Vernal.

9. There is more Saratoga brome this year than last year. I still like orchard the best for quantity, but I don't think the brome got established the first year as well as the orchard. I didn't think the DuPuits alfalfa had the vigour over Vernal alfalfa this year as it did last year.
10. The one thing I did notice most in these plots is the way it came on after cutting, to give me extra pasture.
11. Saratoga brome did not seem to winter quite as well as orchardgrass but seemed more palatable as pasture in 1961. Both plots seemed fairly palatable in 1962, especially in the spring. Cows were turned in about May 20.
12. We like the brome best because we were a little late in cutting. The brome is always preferable with us.

1962 Summary: Bromegrass Competition and Aftermath Production.

Saratoga brome appears to be more vigorous in first growth and aftermath than Lincoln brome, Canadian brome, and Climax timothy. Consequently it produced more in each case. Saratoga began growth earlier in the year than the other grasses.

Climax Timothy was reported to have lowest growth, especially in aftermath. The other two bromes were intermediate between Saratoga and Climax.

Climax was reported as being overshadowed by the vigour of Vernal alfalfa. Saratoga did not crowd out Vernal except in one case. In general, all the bromes were reported to be compatible with Vernal alfalfa in spite of the reports that Vernal had dropped to 30 and 40% of the sward - in the Saratoga plots at 2 locations.

Winterkilling of either grass or legume was reported in only one location.

* * *

1962 Detailed Report

Nine out of the original eleven plantings were reported on in 1962. The plantings were made in 1960 to compare in mixture with Vernal alfalfa each of the following grasses: Saratoga brome, Lincoln brome, Canadian brome, Climax timothy.

In contrast to the farm plantings involving orchard grass and Saratoga brome in mixture with DuPuits alfalfa, no co-operator in this project finds it necessary to plow up the farm planting in 1962.

Only one report indicated any fertilizer applied to the plot area in the fall of 1961 to spring of 1962. One other applied manure in that period. The remainder received neither fertilizer nor manure.

Only two remained uncut or ungrazed in the fall of 1961. Winterkilling was reported in one case for alfalfa and once for timothy. All other reports indicated essentially no winter killing.

Six reports showed Saratoga to have the most spring vigour, followed by Lincoln and Canadian brome. Spring vigour was rated equal to Lincoln and Canadian brome in two reports, poorer in three reports and non-existent in one report.

Vernal alfalfa vigour was reported highest in the Climax plot, lowest in the Saratoga plot and intermediate in the Lincoln and Canadian brome plots.

The resulting estimates of percent grass in the stand at first cutting indicate Saratoga to make up more of the stand (up to 70%) and Climax less of the stand (down to 0) than the other bromes.

Yields for the plots were estimated in the order of Saratoga (most), Lincoln, Canadian, Climax (least). All but one report indicated a cutting date in June.

In five reports no grasses were reported too vigorous for the Vernal alfalfa. In one each, Saratoga and all bromes were put in this category. The report indicating all bromes being too vigorous was the one which reported fertilizer being applied to the area.

Vernal alfalfa was reported to be too vigorous for Climax in five cases, Lincoln in one case and none of the grasses in another case.

Grasses were reported to be of correct vigor for the Vernal alfalfa in five cases for Saratoga, four cases for Canadian, three cases for Lincoln, and two cases for Climax.

Regrowth was greatest from Saratoga in every case, second greatest for Lincoln in five cases, for Canadian in six cases, and for Climax in two cases.

Regrowth was third greatest from Lincoln in one case, and Climax in one case.

Climax was listed as having no regrowth in four reports while Lincoln and Canadian were in this category once each.

Saratoga was reported to make up as much as 40% of the aftermath in some locations.

1962 Co-operators' Comments

1. Saratoga is much thicker than last year. It seems to have a quicker growth system than other bromes. Much faster growth after being mowed. I believe it can stand dry weather to a greater degree than the others and still keep growing.
2. The first year due to an extremely dry summer and fall the brome made very little growth but the Climax and alfalfa did very well. The second year the brome did a bit better and produced excellent feed. The Climax still remained okay. This year the brome really came into its own, all except the Lincoln which seemed to winterkill. The Saratoga in my estimation, is the best variety for this area. It is at least two weeks ahead of the Canadian. The Canadian finally caught up and produced as much feed and of excellent quality but the Saratoga could easily be distinguished from the road ahead of all the rest.
To sum up, I believe the Saratoga would be the best for either early hay pasture or silage but year for year or ton for ton, the climax and alfalfa will still stay with them all and if properly handled makes very good feed. The alfalfa winter killed very little and looks as though it could go on for at least two more years.
3. Since using Vernal alfalfa, I think there is a definite place for a strong growing brome like Saratoga to give a fair per cent of grass in the hay and particularly the aftermath. This helps to reduce bloat problems. On September 5 it looked as though the Saratoga would grow a great deal more grass than the others, especially with rain.
4. Saratoga appears superior at all stages of growth.
5. Saratoga seems very good grass but perhaps too much for Vernal alfalfa. I would like to try it with DuPuits. It seemed to do well in the dry spring but did not give a great deal of aftermath this year. The field being close to rock may have had a great deal to do with this.
6. Saratoga growing several days earlier than others. Alfalfa was less prominent with Saratoga brome and most prominent with Climax Timothy. Saratoga is more like orchardgrass in growth but still maintains the quality of bromegrass for hay purposes. Next spring, I plan to seed 13 acres to a Saratoga brome and alfalfa mixture.

7. I think Saratoga brome has possibilities as an alfalfa companion, I am especially glad to see it in flush grass this year as it helped against bloat. The field, although pastured this September, is in good heart and I'm looking for my biggest yield next year as there is a very desirable stand now and I'm using controlled grazing. I feel that in 1964 this field may be pasture.
8. I believe that Saratoga brome will produce more and better hay because of added leaf. I expect to leave plots down for another year for pasture.
9. Saratoga is very vigorous growth and would mix well with DuPuits alfalfa. In my estimation it will take the place of orchard grass in mixtures. Orchard tends to bunch too much.

* * *

Meadow Fescue Variety Test, 1961

(Yield in Lb. of Dry Matter/Acre, 1962)

Variety	Cut 1	Cut 2	Cut 3	Total
1. Clair	2441	2182	1567	6190
2. Climax	2236	2376	1259	5871
3. Ottawa Syn. C	2484	1723	1347	5554
4. Ottawa Syn. A	2289	1832	1309	5430
5. Ottawa Syn. B	2366	1644	1271	5281
6. Mimer	2281	1243	1090	4614
7. Ensign	1757	1338	1035	4130
Mean Square for Varieties	**	B**	**	

Comments:

Cut 1 - May 25

Cut 2 - July 13

Cut 3 - Aug. 16

Disease - Ensign was the only variety to exhibit rust infection in October 1961, and August, 1962.

Stand - All varieties had a good stand with the exception of Ensign.

Three pasture cuts were obtained from this trial which is unexpected under our climatic conditions. However, the first cut was taken before the growing points reached the height of cutting (2").

In this test, the timothy varieties were superior to the meadow fescue varieties in Cut 2, Cut 3, and total production of dry matter. The three Ottawa synthetics were also superior to the varieties Mimer and Ensign in total yield.

Meadow Fescue Variety Observation Nurseries

Twenty-three meadow fescue varieties and strains were evaluated visually in replicated row plantings seeded in 1959 and 1960. On the basis of these observations, the following entries would seem to merit inclusion in a meadow fescue screening trial:

Barenza Hay
0280
S-215
Sceempter

Trifolium II
Trifolium 6622
W.A.S. 9
W.A.S. 22

Exp. 613

Meadow Fescue Variety Observation Nursery, 1960

Summary of 1960, '61 and '62 Data

Variety	Origin	May 1-7	Vigour ¹⁾		Height at Bloom
			June 1-2	June 23 ²⁾	
<u>Medium</u>					(inches)
Barenza Hay	Netherlands	3.0	3.0	3.0	38
0280	Sweden	3.5	2.5	2.5	40
Sv. 01207	"	3.0	3.5	3.0	39
Sv. 1218	"	4.0	4.0	2.0	40
W.A.S. 22	"	3.5	3.5	2.5	38
Mimer	"	3.5	3.0	2.5	40
W.A.S. 9	"	3.5	3.5	2.5	39
C.B. Hay	Netherlands	4.5	4.0	3.0	38
<u>Late</u>					
Sv. 01217	Sweden	4.0	4.5	2.5	37
Sv. 701	"	4.0	4.0	2.0	38
C.B. Pasture	Netherlands	3.5	4.0	2.5	36
Climax (Timothy)		2.5	3.0	1.5	38
Essex (Timothy)		2.5	3.5	2.0	36

(1) All vigour ratings are from 1 (good) to 5 (poor).

(2) Aftermath

Note: Differences in bloom data among the entries involved only 3-4 days from the earliest to the latest.

Exp. 605Meadow Fescue Variety Observation Nursery, 1959

Summary of 1960, '61 and '62 Data 1)					
Variety	Origin	May 1-8	Vigour June 1-2	June 23 2)	Height at Bloom
					(inches)
<u>Early</u>					
Ensign	Canada	4.5	--	--	--
Mefon	"	4.0	3.5	3.0	37
Mommersteeg's					
- Hay Type	Netherlands	3.0	3.5	4.0	37
- Pasture	"	3.0	4.0	1.0	35
S-170 (Tall F.)	Wales	1.0	1.0	1.0	42
<u>Medium</u>					
Barenza P	Netherlands	3.5	4.0	3.0	36
Festo		4.0	4.0	2.0	34
Melle P	Belgium	3.5	3.5	3.0	36
Mimer		3.5	2.5	2.5	36
S-53	Wales	4.5	5.0	3.5	28
S-215	"	3.5	3.0	2.5	37
Sceempter	Netherlands	3.0	2.5	4.0	37
Trifolium II	Denmark	3.0	2.5	3.0	37
" 6622	"	3.0	3.0	3.0	36
Prato (K.B.G.)		4.0	4.5	3.0	—

(1) All vigour ratings are from 1 (good) to 5 (poor).

Summary of Meadow Fescue Varieties

Tested since 1952

Variety	Origin	Tested for Yield	Comments
Barenza H	Holland		Similar to Mimer.
P	"		Low spring vigour.
C.B. H	"		Low spring vigour.
P	"		Low spring vigour.
Ensign	C.E.F.	✓	Lower in yield than Mimer. Less rust resistance than Mimer.
Festo			Low spring vigour.
Mefon	O.A.C.	✓	Similar to Ensign in yield and leafiness.
Melle P	Belgium		Not as vigorous as Mimer.
Mimer	Sweden	✓	Probably the most promis- ing variety.
Monmersteeg's H	Holland		Similar to Mimer, but earlier.
P	"		Low spring vigour. Good aftermath.
S-53	Wales	✓	Lacking in vigour. Low yield. Leafy.
S-215	"	✓	Similar to Ensign in yield and leafiness.
Sceempter	Holland		Merits further testing.
Trifolium II	Denmark		Merits further testing.
" 6622	"		" " "

Tall Fescue Varieties

Alta		✓	
Ky 31	Kentucky	✓	
S-170		}	Similar in yield and leafiness.

In 1960, a total of 30 grass species were seeded in plots 5' x 15'. (See list below). As indicated in the Progress Report, 1961, 9 species were winter-killed during 1960-61.

In 1962, these species were observed from time to time, but no ratings were taken.

Tall oat grass appeared to be the most productive of the species when cut close to the bloom date. The sample sown bloomed earlier than Lincoln brome-grass in 1961, but the difference in 1962 was only a few days.

Another interesting species was Agropyron cristatum (crested wheatgrass). The variety, Fairway, was seeded and produced a very leafy and soft foliage.

The other species of wheatgrass appeared to be much coarser, and all would seem to be less productive than our common species.

Species	Variety
<hr/>	
1. Agropyron cristatum	Fairway
2. " riparium	Steambank
3. " trachycaulum	---
4. " elongatum	---
5. " intermedium	---
6. Elymus canadensis	Attai
7. " junceus	---
8. " virginicus	---
9. Stipa viridula	---
10. Dactylis glomerata	Frode
11. Bromis inermis	Lincoln
12. Phleum pratense	Climax
13. Phalaris arundinacea	Loreed
14. Festuca elatior	C.B. Hay Strain
15. Lolium perenne	Barenza (Hay)
16. Festuca elatior var. avundinacea	
17. Festuca rubra	
18. Merion Blue	
19. Meadow Foxtail	
20. Canada Blue	
21. Red Top	
22. Westerwolth Rye Grass	
23. Tall Oat Grass	
24. Italian Ryegrass	
25. Common Domestic Dallisgrass	
26. Crested Dogstail	
27. Common Bermuda grass	
28. Common Bahia grass	
29. Mesa Buffalo grass	
30. Johnsongrass	

FORAGE-SORGHUM VARIETIES - 1962

Length: 20'

1 row harvested September 13

Variety	Percent Dry Matter	Pounds per Acre
NK 145	25.79	7739.1
NK 300	24.92	6754.3
NK 315	28.91	9934.6
NK 330	27.97	7716.3
Sudax SX 11	27.46	8107.3
Sudan (Piper)	38.46	6701.3
HS 1W93	25.13	8392.4
RP 30F	21.24	9560.5

Crop: Orchard grass *Dactylis glomerata* L.

Name: "Rideau". The name was chosen after the Rideau River that passes close by the Ottawa Experimental Farm. The testing designation of this strain was Ottawa "200".

Origin: Developed by Dr. W.R. Childers, Genetics and Plant Breeding Research Inst., Ottawa, Ontario.

Breeding Method Employed:

This variety is a 4-clone synthetic. The original selections work began in 1949. The two most winter hardy clones, No. 4 from Sweden and No. 6 from Estonia were taken from the parent clones of the Ottawa "100" strain. These clones were randomized in a polycross block with two progeny tested, late maturing winter hardy clones No. 5 and No. 19 developed in the breeding program. Polycross progeny tests showed that a successful synthesis of the original characters had been achieved. Synthetic seed was produced and a program of testing planned. Also seed was sent to Research Station, St. Anne de la Pocatiere for testing under severe winter conditions, and to the Agassiz Experimental Farm where mild climatic conditions occur.

Characteristics:

Rideau is a late-maturing type of orchard grass possessing a high degree of winter-hardiness. It is 8-10 days later than the recommended variety Frode and similar to S-143. A late variety of orchard grass is easier to manage as pasture, maintaining palatability over a longer period, whereas commercial orchard grass produces a high percentage of unpalatable seed heads at an early stage of growth.

The Rideau variety when grown with Vernal alfalfa for hay, is in the late boot stage when Vernal is in the bud stage, providing a highly nutritious grass-legume hay. Early Danish type varieties have passed their most nutritious stage at this time and provide a lower quality hay.

In 1959, seven one acre fields of Frode Latar, S-143 and Rideau were established on Ontario farms by the Federated Colleges, Guelph, for comparative testing. In the winter of 1960-61 severe winter conditions occurred; winter killing of stands of S-143 necessitated plowing up some fields. The Rideau variety was not seriously affected; stands being similar to Frode and Tardus II which are recommended for use in Ontario.

In early spring growth Rideau is intermediate between the vigorous early varieties and the slow, late developing S-143. Whereas S-143 provides more pasture in the fall this late fall growth is associated with susceptibility to winter damage.

The Rideau variety develops less leaf-diseases, at haying time, partly due to selection for resistance and partly because diseases do not develop as early in late maturing varieties. The plant type is leafy, with leaves held high up the stem, and has a high density of heads which come into bloom evenly. Seed production has been comparable to Hercules, with yields of 202, 176 and 96 pounds of seed per acre in 1960-62 respectively.

Rideau has consistently outyielded S-143, which is in the same maturity group, both in the area of more severe winters, and in south-western Ontario where orchard grass enjoys most popularity. S-143 was taken off the recommended list for Ontario

in 1963 and Rideau was recommended for licensing as a possible replacement. The testing of Rideau has been carried out under close co-operation with the Federated Colleges, Guelph, and the Ontario Forage group committee and the Quebec Seed Board.

The Rideau variety was recommended for licensing by the Ontario Field Crop Recommendation Committee at its November, 1962 meeting. It is also recommended by the Genetics and Plant Breeding Research Institute, Ottawa.

Plan for Distribution:

The Forage Seed Project will be responsible for the seed multiplication and distribution. There are 250 pounds of breeders seed available at this date. The Genetics and Plant Breeding Research Institute will be responsible for maintaining approximately $2\frac{1}{2}$ acres of breeders seed for the Forage Seed Project use.

Forage Crop Publications and Papers Presented
from May, 1962 to April 30, 1963

Crop Science Department, O.A.C.

(Publications and papers presented prior to May 1962 are listed in the 1961 Progress Report.)

Department of Crop Science. High dry matter silage or haylage. Dept. of Crop Sci. mimeo 120/52.1 Y62, 4 pp. June, 1962.

Department of Crop Science. 1962 Crop Notes for extension, promotion and sales programs. Dept. of Crop Sci. mimeo, 30 pp. Sept. 1962. (With Kemptville Agricultural School and Western Ontario Agricultural School.)

Jones, G.E. Relative merits of growing cereal crops or forages for milk and/or beef production in the East Central Region. Can. Soc. Agron. Proc. 1962, pp. 43-46, 1962.

Jones, G.E. Use of herbicides in the establishment of forage seedlings. Forage Notes 8: No. 3, 16-19, Fall, 1962.

Ontario Forage Crops Committee. 1962 progress report on farm plantings of forage crops, Department of Crop Sci. mimeo, 15 pp. Oct. 1962. (Dept. of Crop Sci., with K.A.S., W.O.A.S., and Soils and Crops Branch of the O.D.A.)

Tossell, W.E. Ontario's field crop research program. Proc. Ont. Soil and Crop Improvement Assoc. 1963 convention, pp. 81-85, Jan. 1963.

Tossell, W.E. What the forage seed consumption area of Canada looks for in seed. Can. Seed Growers' Assoc. Proc. pp. 19-24, June 1962.

Young, W.S. Field crop recommendations for 1963. Proc. Ont. Soils and Crop Improvement Assoc. 1963 convention, pp. 76-81, Jan. 1963.