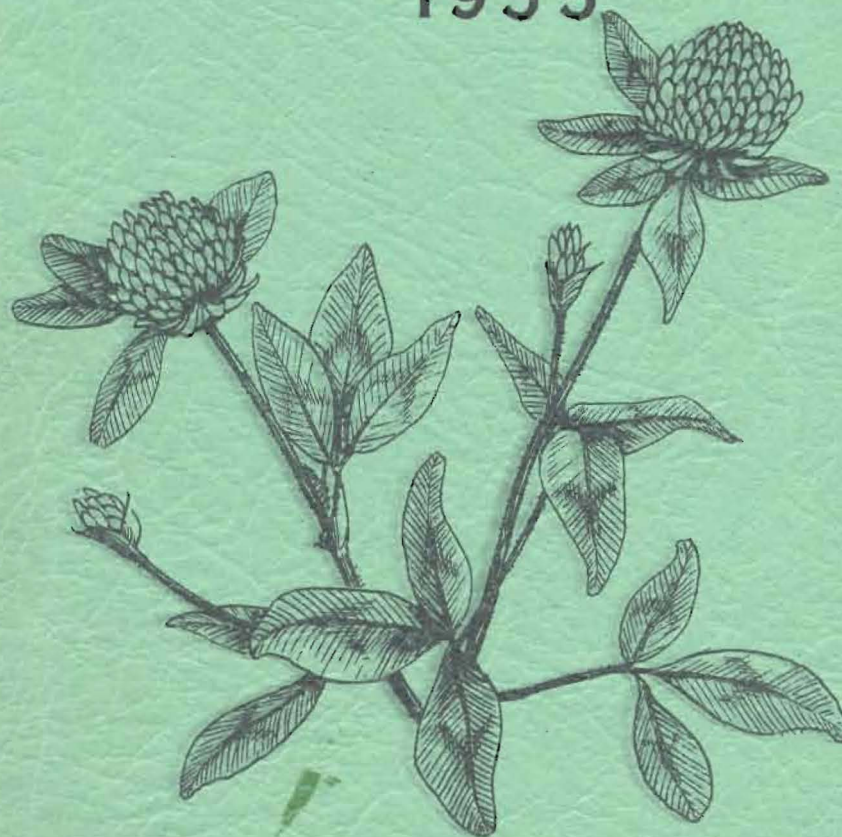


PROGRESS REPORT
FORAGE CROP
INVESTIGATIONS

BREEDING AND STRAIN TESTING

1955



Field Husbandry Department
Ontario Agricultural College
Guelph

CONTENTS

	<u>Page</u>
1. Timothy strain trials - - - - -	1
2. Orchard grass strain trials - - - - -	7
3. Brome grass strain trials - - - - -	11
4. Fescue strain trials - - - - -	13
5. Alfalfa breeding and testing - - - - -	15
6. Alfalfa management - - - - -	19
7. Red clover breeding and testing - - - - -	21
8. White clover strain trial - - - - -	32
9. Birdsfoot trefoil breeding and testing - - - - -	34
10. Sweet clover strain trial - - - - -	37
11. Miscellaneous legume projects - - - - -	38
12. Summary of introductions, 1949-1955 - - - - -	39

Timothy Strain Trials

Timothy trials were as follows:

Trial	Year Seeded	Location	Remarks
1. Timothy Strain Trial	1952	Guelph	Seeded alone and with red clover. Growth average. Completed.
2. Timothy Strain Trial	1953	Guelph	Pure Stand. High yields, severe lodging.
3. Timothy Strain Trial	1953	Kemptville	Co-operative with D.L. Parks.
4. Timothy Strain Trial	1954	Hespeler	Fox sand, low yields. Drought thinned stands severely in 1955. No aftermath.

Table 1:- Summary of D.M. Yields of Timothy Strains

	Guelph 1952	Guelph 1953**	Hespeler 1954*	Kemptville 1953**	Lynn 1954*
	Hay				
Climax	2.49***	3.85	1.40	2.84	0.72
Medon	2.55	4.06	1.50	2.52	0.76
Milton	2.66	4.02	1.52	2.58	0.78
S-48	--	3.46	1.30	2.40	0.54
Common	2.65	3.81	1.43	2.62	0.88
	Aftermath				
Climax	0.22**	0.50	--	0.89	--
Medon	0.17	0.54	--	0.82	--
Milton	0.19	0.52	--	0.75	--
S-48	--	0.38	--	0.72	--
Common	0.22	0.53	--	1.01	--
	Hay + Aftermath				
Climax	3.16**	4.34	--	3.74	--
Medon	3.26	4.60	--	3.35	--
Milton	3.43	4.54	--	3.32	--
S-48	--	3.84	--	3.11	--
Common	3.32	4.34	--	3.63	--

* data from 1 year (1955)

** 2 year mean

*** 3 year mean

bulph
 Table 2:- Timothy Strain Trial/1952 (Pure Stand) D.M. Yields
gnr

Strain	Hay				Aftermath			Hay + Aftermath		
	1953	1954	1955	Mean	1953	1955	Mean	1953	1955	Mean
Ont. Common	3.10	1.75	3.11	2.65	0.31	0.14	0.22	3.40	3.25	3.32
1-Milton	3.30	1.50	3.18	2.66	0.26	0.12	0.19	3.56	3.30	3.43
3-Medon	3.25	1.45	2.94	2.55	0.22	0.12	0.17	3.47	3.06	3.26
2-Marietta	2.99	1.73	3.24	2.65	0.34	0.18	0.26	3.33	3.42	3.38
8-Lorraine*	2.88	1.39	2.85	2.37	0.22	0.12	0.17	3.10	2.97	3.04
4-Itasca	3.20	1.62	2.80	2.54	0.26	0.10	0.18	3.45	2.90	3.18
5-Climax	3.07	1.59	2.82	2.49	0.33	0.10	0.22	3.40	2.91	3.16
7-Drummond	3.11	1.37	2.73	2.40	0.18	0.07	0.12	3.29	2.80	3.04
10-Hopkins*	2.96	1.27	2.44	2.22	0.17	0.08	0.12	3.13	2.52	2.82
9-Cornell 1777*	2.61	1.57	2.70	2.29	0.30	0.09	0.20	2.91	2.79	2.85
6-Cornell 4059*	2.95	1.66	2.92	2.51	0.32	0.14	0.23	3.27	3.06	3.16
Mean	3.04	1.54	2.88		0.26	0.12		3.30	3.00	
L.S.D. - 0.05	0.26	0.26	N.S.		0.09			0.28	N.S.	
0.01	0.36	0.34	N.S.		0.10			0.38	N.S.	

* established from fair to poor, other good.

Table 3:

Timothy Strain Trial 1952. Leafiness, Crude Protein & Crude Fibre Data

	% Leaf 1955	% Protein			Lbs. Prot./Ac.			% Crude Fibre
		1954	1955	Mean	1954	1955	Mean	
Climax	43.9	7.0	5.9	6.4	403	333	368	40.0
Medon	43.4	6.8	6.0	6.4	390	353	372	39.0
Drummond	52.8	7.7	6.9	7.3	430	377	404	38.4
Common	37.2	6.4	5.7	6.0	351	355	353	39.4

Table 4:-

Timothy Strain Trial 1953, Tons D.M. per Acre

	Hay			Aftermath			Hay + Aftermath		
	1954	1955	Mean	1954	1955	Mean	1954	1955	Mean
S-48	2.92	4.01	3.46	0.38	*0.37	0.38	3.31	*4.38	3.84
S-50	2.78	3.56	3.17	0.14	0.11	0.12	2.93	3.68	3.30
S-51	3.06	3.82	3.44	0.48**	0.45	0.46	3.54**	4.27	3.90
Medon	3.67	4.44	4.06	0.61	0.48	0.54	4.28	4.92	4.60
Danish Selection	3.55	4.02	3.78	0.77	0.52	0.64	4.32	4.54	4.43
English Selection	3.28	4.01	3.64	0.43	0.44	0.44	3.71	4.45	4.08
Commercial	3.66	3.96	3.81	0.59	0.47	0.53	4.25	4.43	4.34
Climax	3.58	4.12	3.85	0.56	0.43	0.50	4.14	4.55	4.34
Paton Selection	3.34	4.18	3.76	0.56	0.56	0.56	3.90	4.65	4.28
Milton	3.85	4.20	4.02	0.54	0.50	0.52	4.38	4.69	4.54
Medon Selection	3.74	4.02	3.88	0.32	0.39	0.36	4.06	4.41	4.24
Mean	3.40	4.03		0.49			3.89		
L.S.D. (0.05)	0.57	0.43		0.20			0.65		
C.V.	11.8	7.3		28.8			11.8		

* Mean over 3 reps.

** Mean over 2 reps.

Table 5:- Leafiness Data on Timothy Strain Trial 1953

Strain	Leafiness 1954		Leafiness 1955*		
	%	Increase	%	Increase	lbs. leaf/ c.
Climax	51.8	10.4	49.5	8.0	4,300
Medon	51.3	9.9	44.5	3.0	4,140
Milton	40.0	1.4	--	-	--
S-48	--		60.7	19.2	4,636
S-51	--		62.6	21.1	4,914
Common	41.4		41.5		3,612

* Common 20% in bloom when plots harvested

Table 6:- Crude Protein and Data on Timothy Strain Trial 1953.

	<u>1954</u>	<u>1955</u>	<u>1956</u>	<u>Mean</u>
Climax	7.7	7.5		7.6
Medon	7.7	6.6		7.2
Milton	8.0	-		-
S-48	-	8.0		-
S-51	-	7.5		-
Common	7.4	7.3		7.4
L.S.D.		N.S.		
C.V.		15.1		

Table 7:- Timothy Strains Hespeler 1954 and Bowmanville. Data in 1955.

	<u>D.M./Acre</u> <u>June</u> <u>Hespeler</u>	<u>%</u> <u>Leaf*</u> <u>Hespeler</u>	<u>% Leaf</u> <u>Bowmanville</u>
Climax	1.40	70.4	46.3
Medon	1.50	-	44.7
S-48	1.30	82.9	-
Milton	1.52	-	-
Common	1.43	64.4	37.9

* growth light, drought reduced heading.

Table 8:- Timothy Strains Kemptville, 1953. Tons D.M. per Acre.

	<u>Hay</u>			<u>Aftermath</u>			<u>Hay + Aftermath</u>		
	1954	1955	Mean	1954	1955	Mean	1954	1955	Mean
Climax	2.15	3.54	2.84	1.17	0.61	0.89	3.32	4.15	3.74
Medon	1.89	3.16	2.52	1.16	0.48	0.82	3.05	3.64	3.35
Milton	2.09	3.06	2.58	1.08	0.42	0.75	3.17	3.48	3.32
S-48	1.84	2.95	2.40	1.09	0.34	0.72	2.93	3.29	3.11
Commercial	1.95	3.29	2.62	1.50	0.52	1.01	3.45	3.81	3.63
Mean	1.98	3.20		1.20	0.47	0.84	3.18	3.67	

Table 1:- Orchard Strain Trial (1953) at Delph

Strain	Date in Bloom June		Leaf+ 1954	Rel. Worth** June 1955	Tons D.M./Acre					
	1954	1955			1954			1955		
					Hay	After.	Total	Hay	After.	Total
Common	15	8	8.5	x	2.72	0.42	3.13	2.14*	0.43*	2.57*
Oron	16	8	9.0	x	2.74	0.40	3.16	2.57	0.47	3.04
Wisc. 52	16-	8	6.2	x	3.02	0.48	3.48	3.04	0.64	3.68
Potomac	14-	9	6.5	x	2.84	0.48	3.30	3.13	0.54	3.67
Past. Lab. 1	15	6	7.2	x	2.90	0.47	3.37	2.48	0.50	3.48
Past. Lab. 5	20	13	3.2	3.0	2.88	0.33	3.21	3.10	0.49	3.59
Past. Lab. 7	22	13	3.0	2.5	2.68	0.43	3.14	2.54	0.62	3.16
H-2	20	14	1.0	2.0	2.33	0.57	2.92	2.32*	0.45*	2.77*
M2-11142	16	8	9.0	x	2.72	0.46	3.20	2.88*	0.41*	3.29*
P-2453	19	11	7.8	x	2.61	0.39	2.98	2.62	0.50	3.12
233	20	13	1.8	x	1.74	0.45	2.20	1.96	0.52	2.48
S-37	20	13	1.0	2.0	2.36	0.51	2.87	2.48	0.82*	3.30
S-143	20	13	1.5	2.5	2.25	0.48	2.72	2.46*	0.61	3.07
Gartons 337	19	11	1.8	2.0	2.17	0.47	2.63	2.02	0.52	2.54
Scotia	19	13	6.0	x	2.44	0.40	2.83	2.02	0.52	2.54
Akaroa	19	10	4.7	3.0	2.23	0.47	2.72	2.18*	0.41*	2.59*
Tammisto	18	14	4.5	2.0	2.82	0.26	3.10	2.74	0.38	3.12
Otofte Late II	19	13	3.8	2.7	2.76	0.46	3.19	2.49	0.48	2.97
Frode	20	14	2.0	1.0	2.79	0.61	3.45	3.53*	0.67*	4.20*
Tarduss II	19	13	3.5	1.5	2.76	0.45	3.20	3.24	0.54	3.78
Weibull H-11	20	11	6.8	3.0	2.74	0.57	3.35	2.78	0.48	3.26
Leth. 627	11-	4	9.0	-	2.74	0.23	2.96	1.83*	0.30*	2.13*
Leth. 628	12	4	8.8	-	3.12	0.29	3.44	2.60	0.44	3.04
Leth. 629	12	4	9.0	-	2.82	0.24	4.01	2.70	0.35	3.05
Leth. 630	11	4	9.5	-	2.98	0.19	3.14	2.03	0.28	2.31
Mean	17	10	5.4		2.65	0.42	3.07			
L.S.D.-(0.05)					0.34	0.10	0.38			
C.V.					9.0	17.7	8.6			

+ 1 (good) to 10 (poor)

* 1 replicate only, other mean of 2 replicates in 1955 and of 4 replicates in 1954.

** 1 (good) to 3 (fair); x unsatisfactory.

Table 2:- Orchard Strain Trial 1953. Chemical Analysis, 1955.

Strain	% Crude Protein			% Crude Fiber		
	Plot 1	Plot 2	Mean	Plot 1	Plot 2	Mean
S-143	7.8	-	7.8	40.0	-	40.0
S-37	8.3	6.9	7.6	38.1	39.5	38.8
Tammisto	7.6	7.4	7.5			
Gartons 337	7.1	7.5	7.3			
Frode	7.2	-	7.2	39.5	-	39.5
Tardus II	6.7	6.8	6.8			
Otofte Late II	6.3	6.8	6.6			
Past. Lab. Syn. 5	6.5	5.9	6.2			
Oron	6.4	4.1	5.2	39.6	38.7	39.2
Commercial	7.3	-	7.3	42.1	-	42.1

Table 3:- Orchard Strain Trial 1953. Percent Leaf in 1955.

	<u>% Leaf</u>
S-37	77.9
Frode	70.5
Past. Lab. Syn. 5	52.3
Commercial	50.0

- 9 -

Regional Uniform Orchard Strain Trials. D.M. in Tons per Acre

Strain	Hay			Aftermath			Hay + Aftermath			Hay + Aftermath Mean
	1954	1955	Mean	1954	1955	Mean	1954	1955	Mean	
Kemptville, 1953 seeding										
Hercules	1.30	1.56	1.43	1.34	0.74	1.04	2.64	2.30	2.47	0.90
Oron	1.41	2.31	1.86	1.17	0.86	1.02	2.58	3.17	2.88	1.01
Danish	1.13	1.60	1.36	1.24	0.74	0.99	2.37	2.34	2.36	0.83
S-26	0.68*	2.00	1.34	1.25*	0.73	0.99	1.93*	2.73	2.33	0.70
Common	1.20	2.26	1.73	1.22	0.72	0.97	2.42	2.98	2.70	0.93
Mean	1.14	1.95		1.24	0.76		2.39	2.70		0.89
Guelph, 1953 seeding										
Hercules	2.90	2.58	2.74	0.38	0.56	0.47	3.28	3.14	3.21	
Oron	2.52	2.40	2.46	0.35	0.55	0.45	2.87	2.95	2.91	
Danish	2.54	2.91	2.72	0.37	0.60	0.48	2.91	3.51	3.21	
S-26	1.96	2.10	2.03	0.42	0.55	0.48	2.38	2.65	2.52	
Common	2.58	2.86	2.72	0.39	0.56	0.48	2.97	3.42	3.20	
Mean	2.50	2.57		0.38	0.56		2.88	3.13	3.02	
Hespeler, 1954 seeding										
Hercules	-	1.09	-	-	***	-	-	-	-	
Oron	-	1.08	-	-	-	-	-	-	-	
Danish	-	1.17	-	-	-	-	-	-	-	
S-26	-	1.03	-	-	-	-	-	-	-	
Common	-	1.15	-	-	-	-	-	-	-	
Mean										

* mean over 2 replicates

** severe drought resulted in practically no aftermath growth.

Orchard Grass Strain Trials Seeded in 1955

<u>Hay-Pasture Series</u>	<u>Pasture Series</u>	<u>Source</u>
Commercial	Commercial	Composite
Oron	Oron	Foundation
Frode	Frode	Sweden
Weibull H-11	Weibull H-11	Sweden
Past. Lab. III	Past. Lab. III	Penn. State
Past. Lab. I	S-143	P. State: Wales
Past. Lab. II		Penn State
S-26		Wales
S-37		Wales
Tardus II		Sweden
Potomac		Beltsville
Tammisto		Finland
Hercules		C.E.F.
K-46		

Table 1:- Brome Strain Trial 1953. Tons D.M. per Acre.

Strain	Hay			Aftermath			Hay + Aftermath		
	1954	1955	Mean	1954	1955	Mean	1954	1955	Mean
* Can. Common	3.48	3.27	3.38	0.39	0.37	0.38	3.87	3.64	3.76
* Parkland	3.34	3.31	3.32	0.35	0.35	0.35	3.69	3.66	3.68
* Superior	3.21	3.22	3.22	0.33	0.40	0.36	3.54	3.62	3.58
* S-4088	3.49	3.44	3.46	0.36	0.35	0.35	3.86	3.80	3.83
* Manchar	4.02	3.72	3.87	0.50	0.38	0.44	4.52	4.11	4.32
* Martin	3.94	4.09	4.02	0.58	0.44	0.51	4.52	4.53	4.52
+ Achenbach	4.28	4.02	4.15	0.67	0.40	0.54	4.95	4.42	4.68
+ Fischer	4.39	4.19	4.29	0.49	0.41	0.45	4.88	4.60	4.74
+ Lincoln	4.30	4.00	4.15	0.64	0.41	0.52	4.94	4.40	4.67
+ Lyon	4.83	4.10	4.46	0.64	0.48	0.56	5.48	4.58	5.03
+ Lancaster	4.34	4.17	4.26	0.44	0.32	0.38	4.78	4.49	4.64
+ Southland	4.75	4.08	4.42	0.64	0.50	0.57	5.39	4.58	4.98
Elsberry	3.97	3.88	3.92	0.76	0.53	0.64	4.74	4.40	4.57
Homesteader	3.94	4.00	3.97	0.56	0.36	0.46	4.50	4.36	4.43
B-in-12	3.93	3.54	3.74	0.51	0.38	0.44	4.44	3.92	4.18
Br. 3	4.05	3.88	3.96	0.63	0.38	0.50	4.68	4.25	4.46
Mandan 404	3.76	3.95	3.86	0.41	0.42	0.42	4.17	4.38	4.28
Saratoga	3.83	3.76	3.80	0.66	0.42	0.54	4.49	4.18	4.34
N.Y.H.	4.38	4.14	4.26	0.62	0.45	0.54	5.00	4.58	4.79
Mean	4.01	3.83		0.54	0.41		4.55	4.24	
Mean									
Northern (*)	3.58	3.51	3.54	0.42	0.38	0.40	4.00	3.89	3.95
Southern (+)	4.48	4.09	4.28	0.59	0.42	0.50	5.07	4.51	4.79

Table 2:- Brome Strain Trial 1953. Comparison of Selected Strains.

Strain	Hay + After. 2 yr. Ave. Tons D.M./Ac.	Hay Quality 1955			Seed Yield 100 Seed Lbs./Acre Weight 1955 mgms. 1955	
		% Leaf	Coarse- ness Rating*	% Crude Protein		
Lyon	5.03	38.5	3	8.4	518	302
Southland	4.98	37.9	4	7.7	616	327
Achenbach	4.68	39.7	4	7.4	483	322
Parkland	3.68	41.2	1	8.3	324	275
Can. Brome	3.76	37.7	2	8.1	500	307

* 1 (fine) to 4 (moderately coarse)

Table 3:- Brome Regional Strain Trials. Tons D.M. per Acre

Strain	Hay ¹⁹⁵³			Aftermath ¹⁹⁵⁶			Hay + Aftermath ¹⁹⁵⁶		
	1954	1955	Mean	1954	1955	Mean	1954	1955	Mean
Kemptville, 1953 seeding									
Achenbach	2.55	2.76	2.66	1.00	0.78	0.89	3.55	3.54	3.54
Fischer	2.49	2.91	2.70	0.94	0.78	0.86	3.43	3.69	3.56
Common	2.18	2.49	2.34	0.88	0.55	0.72	3.06	3.04	3.05
Mean	2.41	2.72		0.94	0.70		3.35	3.42	
Hespeler, 1954 seeding									
Achenbach	-	1.62	-	-	0.29	-	-	1.91	-
Fischer	-	1.61	-	-	0.28	-	-	1.89	-
Manchar	-	1.24	-	-	0.26	-	-	1.50	-
Southland	-	1.64	-	-	0.28	-	-	1.92	-
Common	-	1.18	-	-	0.20	-	-	1.38	-
Mean		1.46			0.26			1.72	

Brome Strain Trials Seeded in 1955

<u>Hay-Pasture</u>			<u>Pasture</u>		
Achenach 10 + Vernal 8			Achenbach 10 + Vernal 6 + Ladino 2		
Lyon	"		Lyon	"	"
Saratoga	"		Saratoga	"	"
Southland	"		Southland	"	"
Can. Brome	"		Can. Brome	"	"

Table 1:- Fescue Strain Trial at Kemptville (1953). Tons D.M. per Acre.

Strain	Hay			Aftermath			Hay + Aftermath		
	1954	1955	Mean	1954	1955	Mean	1954	1955	Mean
Ensign	1.53	2.02	1.78	0.76	0.51	0.64	2.29	2.53	2.41
Mefon	1.57	1.93	1.75	0.74	0.47	0.60	2.31	2.40	2.36
Ottawa 39	2.15	3.02	2.58	1.22	0.78	1.00	3.37	3.80	3.58
Common	1.84	2.13	1.98	0.70	0.53	0.62	2.54	2.66	2.60
Mean	1.77	2.28		0.86	0.57		2.63	2.85	

Table 2:- Fescue Strain Trial, 1953. Tons D.M. per Acre.

Strain	Hay			Aftermath			Hay + Aftermath		
	1954	1955	Mean	1954	1955	Mean	1954	1955	Mean
Mefon	3.05	2.95	3.00	0.26	0.40	0.33	3.32	3.34	3.33
Ensign	3.02	3.28	3.15	0.35	0.37	0.36	3.37	3.64	3.50
S-215	3.38	3.05	3.22	0.33	0.36	0.34	3.71	3.42	3.56
S-53	2.91	2.80	2.86	0.28	0.42	0.35	3.19	3.22	3.20
Commercial	3.40	3.21	3.30	0.23	0.31	0.27	3.63	3.52	3.58
Ky-31	3.83	3.29	3.56	0.45	0.60	0.52	4.28	3.89	4.08
Alta	3.87	3.45	3.66	0.73	0.72	0.72	4.60	4.17	4.38
Ottawa 39	4.40	3.91	4.16	0.53	0.62	0.58	4.93	4.52	4.72
Medon	3.88	4.13	4.00	0.57	0.48	0.52	4.45	4.61	4.53
Mean	3.53	3.34		0.42	0.48		3.94	3.82	
L.S.D. (0.05)	0.49	0.47		0.14			0.54		
Mean									
Meadow	3.16	3.15	3.15	0.28	0.36	0.32	3.43	3.50	3.47
Tall	4.03	3.55	3.79	0.57	0.65	0.61	4.60	4.19	4.39

Alfalfa

Strain Trials

B.E. Twamley

R.P.O.: F.H. 10-14

Year Initiated: 1953.

1953-1954 Seedings

The yields of both hay and aftermath in experiments conducted over a period of 2 - 3 years at Guelph, Kemptville, Hespeler and Lynn are shown in the accompanying table. These tests are being continued and are being supplemented by an additional one at Guelph. Vernal, DuPuits and Narragansett are in the lead in yield production but the lead is not pronounced.

Very considerable varietal differences were found in winter hardiness at Guelph. This is shown in the accompanying table along with data on height in spring and fall.

	Height in inches:		Winter-kill percentage Apr. 22, 1955	Yield tons/acre 1955
	Apr. 21 1954	Oct. 20 1955		
Vernal	2-3	6	3	6.5
Grimm	1-2	5	6	5.6
Ranger	2-3	6-7	11	6.2
Narragansett	1-2	6	3	6.7
Du Puits	3-4	12	45	6.3
Ladak	1-2	3	5	5.7
Rhizoma	1-2	4	4	5.7
Ont. Varieg.	1-2	5	7	5.7

Summary:- Performance of Alfalfa Varieties

	Ave. 4 trials 1st har. yr.* Hay + After.	Guelph 2 yr. ave. Hay + After.	Mean Guelph & Kemptville 2 yr. ave. Hay After. Hay + After.		
-Vernal	3.3	5.5	3.1	2.2	5.3
Du Puits	3.1	5.4	2.8	2.4	5.2
Narragansett	2.9	5.3	2.8	2.3	5.1
Ranger	2.7	5.0	2.6	2.1	4.7
Ladak	3.0	4.8	2.8	1.9	4.7
Rhizoma	2.9	4.7	2.7	2.2	4.9
Can. Variegated	-	4.5	-	-	-
Grimm	2.7	4.4	2.5	2.1	4.6

* trials at Guelph, Hespeler, Kemptville, Lynn.

Alfalfa Strain Trial, Kemptville, 1953.

Tons D.M. /Ac.

	Hay	Aftermath 1	Aftermath 2	Aftermath Total	Total	Lynn Hay 1955
Vernal	2.97	1.05	1.47	2.52	5.49	1.40
Grimm	2.61	1.14	1.29	2.43	5.04	0.99
Ranger	2.62	1.15	1.36	2.51	5.13	1.26
Narragansett	2.78	1.04	1.50	2.54	5.32	1.24
Du Puits	2.72	1.26	1.50	2.76	5.48	1.16
Ladak	2.87	0.90	1.24	2.14	5.01	1.44
Rhizoma	2.74	1.16	1.40	2.56	5.30	1.03

It is seen that although Du Puits suffered very heavy damage and Ranger considerable damage, there was no apparent effect on yield.

1955 Seedings

R.P.O.: F.H. 10-13.

Year Initiated: 1955.

A new seeding was established on section 16C. It consisted of 16 strains replicated four times in a randomized block design. The light companion crop of oats was harvested before maturity, irrigation was provided and the seedlings were cut back on Sept. 2. Establishment was good. A list of the varieties used follows:

Ont. Var.	Buffalo	Narragansett	Du Puits
Rhizoma	Ranger	A 225	Socheville
Ladak	Vernal	A 226	Danish
Grimm	Atlantic	de la Yona	Caliverde

Nurseries

R.P.O.: F.H. 10-14

Year Initiated: 1955

The plants selected in 1954 from the selection nursery on 8B were vegetatively propagated and transplanted to 1A. The parent plant and two good cuttings were used for each clone.

Summary of D.M. Data on Alfalfa Strains. Tons per Acre

Strain	First Harvest Year					Second Harvest Year		
	Guelph 1953++	Kemptville 1953	Hespeler 1954	Lynn 1954	Mean	Guelph 1953	Kemptville 1953	Mean
Hay (June cut)								
Vernal	2.64	2.94	2.02	1.40	2.25	3.72	2.97	3.34
Grimm	1.70	2.71	1.67	0.99	1.77	2.95	2.61	2.78
Ranger	2.18	2.13	1.72	1.26	1.82	3.38	2.62	3.00
Narragansett	2.05	2.59	1.73	1.24	1.90	3.83	2.78	3.30
DuPuits	2.83	2.56	1.78	1.16	2.08	3.38	2.72	3.05
Ladak	2.20	2.59	1.98	1.44	2.05	3.38	2.87	3.12
Rhizoma	2.14	2.75	2.00	1.03	1.98	2.98	2.74	2.86
Ont. Var.	1.86					3.18		
Aftermath (Cut 2 + Cut 3)								
Vernal	1.92	1.64	0.57	0	1.03	2.80	2.52	2.66
Grimm	1.47	1.77	0.48	0	0.93	2.61	2.43	2.52
Ranger	1.52	1.47	0.46	0	0.86	2.83	2.51	2.67
Narragansett	1.75	1.82	0.48	0	1.01	2.89	2.54	2.72
DuPuits	1.78	1.99	0.48	0	1.06	2.88	2.76	2.82
Ladak	1.71	1.48	0.58	0	0.94	2.32	2.14	2.23
Rhizoma	1.66	1.70	0.44	0	0.95	2.68	2.56	2.62
Ont. Var.	1.54							
Total = Hay + Aftermath								
Vernal	4.56	4.58	2.59	1.40	3.28	6.52	5.49	6.00
Grimm	3.17	4.48	2.15	0.99	2.70	5.56	5.04	5.30
Ranger	3.70	3.60	2.18	1.26	2.68	6.21	5.13	5.67
Narragansett	3.80	4.41	2.21	1.24	2.92	6.72	5.32	6.02
DuPuits	4.61	4.55	2.26	1.16	3.14	6.26	5.48	5.87
Ladak	3.91	4.07	2.56	1.44	3.00	5.70	5.01	5.36
Rhizoma	3.80	4.45	2.44	1.03	2.93	5.66	5.30	5.48
Ont. Var.	3.40					5.68		

Alfalfa Management

B.E. Twamley

R.P.O.: F.H. 10-7

Year Initiated: 1954

The history of this experiment during 1955 was as follows:

March 19. Commercial fertilizer applied by hand.

April 11. Farmyard manure applied.

F₁: - 0

F₂: - 8 - 10 tons per acre. Composition approximately 10-5-10.

F₃: - 116 lb. per acre of 60% muriate of potash = 1 lb. per plot.

F₄: - 174 lb. per acre of 20% superphosphate - $1\frac{1}{2}$ lb. per plot

F₅: - F₃ + F₄

F₆: - 2(F₃ + F₄)

June	Cut 1	Oct. 7	Cut 3
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Sept. 2	Cut 2	Nov. 11	Cut 4
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April 22	Stand counts
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July 25	" "
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Sept. 13	Fertilizer applied as on April 11.
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The yield in this experiment was low. The rather light soil combined with the dry summer were probably the limiting factors. At the time of the October cutting the Grimm and Vernal plots were about 4" high, the Ranger plots about 5" and the DuPuits plots 6". No weights were taken for this cutting which included only one third of the plots. Very little growth occurred between Oct. 7 and Nov. 11. Weights were taken on replicate 1 only on Nov. 11. The dry weights ranged from about 40 lbs. per acre to about 700 and averaged about 160 lb. They are presumed to correspond fairly

closely with those that would have been obtained if the Oct. 7 cutting had been weighed.

In the accompanying table some data are given on yields and stands.

Alfalfa Management Study

Yield in Tons/Acre of Dry Matter for Cuts 1 and 2 Combined, 1955

<u>Fertilizer</u>	<u>Du Puits</u>	<u>Ranger</u>	<u>Vernal</u>	<u>Grimm</u>	<u>Mean</u>
Check	2.40	2.27	2.15	1.90	2.18
F. Manure	2.33	2.63	2.85	2.43	2.68
Potash	2.47	2.40	2.25	2.03	2.29
Phosphorous	2.62	2.04	2.43	1.96	2.26
P + K	2.54	2.29	2.63	2.17	2.41
2P + 2K	2.57	2.26	2.72	2.43	2.50
Mean	2.57	2.31	2.50	2.16	2.39

Stands expressed as Number of Plants per Square Foot
1955

	<u>Du Puits</u>	<u>Ranger</u>	<u>Vernal</u>	<u>Grimm</u>	<u>Mean</u>
October, 1954	22.8	23.8	23.6	21.8	23.0
April, 1955	17.1	14.8	19.9	17.0	17.2
July, 1955	14.6	12.7	14.5	14.2	14.0

Red Clover Screening Trial

R.P.O.: F.H. 10-2

B. E. Twamley

Year Initiated: 1953

The purpose of this experiment was to test out under Ontario conditions varieties of red clover of red clover of foreign origin and unnamed local strains against improved Canadian varieties.

The group included nine American, three English and five Canadian varieties as well as Ontario grown commercial seed and two selected strains originating at the O.A.C. It was seeded on May 9, 1953 on 18C as a randomized block with four replicates under a light cover crop of oats. The latter were removed in June. Very satisfactory stands were obtained.

The plots were harvested twice in 1954 and in June 1955. Data obtained on earliness, longevity and disease resistance as well as on yield are shown in the accompanying tables.

Comments:

The English group - Dorset Marl, English Broad, Essex Late.

Inferior to practically all North American strains in hay yield, aftermath and longevity.

The American group

Pennscott - a high yielding early biennial type excelling in production in the first harvest year both for hay and for aftermath. Unfortunately there are but few plants left for the second harvest year. It is susceptible to mildew and to anthracnose.

Wisconsin - The Wisconsin "1/100 Acre" strain performed very well in yield, longevity and disease resistance. The "Mildew-Resistant" strain, although outstanding in resistance to mildew was mediocre

Table 1:- Red Clover Screening Strain Trial. Yield of Dry Matter
in Tons per Acre.

Variety	June 1954	August 1954	Total 1954	June 1955	Total 1954-5
Wisconsin Comp.	2.74	0.64	3.38	1.38	4.76
Dollard	2.84	0.49	3.33	1.38	4.71
Lasalle	2.84	0.49	3.33	1.17	4.50
Wisconsin 1/100	2.67	0.58	3.24	1.24	4.48
Ottawa	2.60	0.54	3.14	1.16	4.30
Emerson	3.01	0.58	3.59	0.69	4.28
Pennscott	2.88	0.63	3.51	0.68	4.19
Common Sel.	2.91	0.51	3.42	0.71	4.13
Redon	2.75	0.41	3.16	0.92	4.08
Kenland	2.55	0.58	3.13	0.89	4.02
Midland	2.52	0.61	3.14	0.80	3.94
Leon	2.60	0.29	2.89	0.94	3.83
Wisconsin M.R.	2.69	0.49	3.18	0.52	3.70
Delaware Sel.	2.57	0.40	2.97	0.62	3.59
Cumberland	2.30	0.55	2.85	0.45	3.30
Wegener	2.69	0.43	3.12	0.17	3.29
Commercial	2.30	0.58	2.88	0.37	3.25
Dorset Marl	2.69	0.45	3.14	0.10	3.24
English Broad	2.40	0.38	2.78	0.10	2.88
Essex Late	2.38	0.14	2.52	0.15	2.67
L.S.D. - 5%	0.32		0.40		
1%	0.43		0.53		
C.V.	8.5		9.0		

Table 2:- Red Clover Screening Strain Trial. Gradings in Characters of Agronomic Importance.

Maturity	Longevity	Mildew Resistance	Anthracnose Resistance
<u>Early</u>	<u>Good</u>	<u>Excellent</u>	<u>Good</u>
Pennscott	Dollard	Wisconsin	Redon
Wisconsin M.R.	Ottawa	Wisconsin 1/100	Leon
Commercial	Wisconsin 1/100		Delaware
	Lasalle	<u>Good</u>	Dollard
<u>Medium Early</u>	Kenland	Essex Late	Commercial
Wegener	Redon	Dollard	Common Sel.
Cumberland			
Emerson	<u>Fair</u>	<u>Fair</u>	<u>Medium</u>
Midland	Leon	Commercial	Wisconsin 1/100
	Common Sel.	Lasalle	Lasalle
<u>Medium</u>	Midland	Pennscott	Ottawa
English Broad	Emerson	Midland	
Wisconsin 1/100	Pennscott	Cumberland	<u>Fair to Poor</u>
Dorset Marl	Wisconsin M.R.	Ottawa	Wisconsin M.R.
Ottawa	Cumberland	Delaware Sel.	Midland
Kenland		Emerson	Emerson
Lasalle	<u>Poor</u>	English Broad	Pennscott
	Delaware Sel.		
<u>Medium Late</u>	Wegener	<u>Poor</u>	<u>Poor</u>
Dollard	Commercial	Kenland	Cumberland
	English Broad	Redon	Kenland
<u>Late</u>	Essex Late	Dorset Marl	
Essex Late	Dorset Marl	Leon	<u>Unknown</u>
Delaware Sel.		Common Sel.	English Broad
Common Sel.		Wegener	Essex Late
Redon			Dorset Marl
Leon			

in other respects. The strain labelled "Composite was a mixture of the above two strains.

Kenland and Midland - Mediocre in yield, longevity, and showing only a limited resistance to anthracnose and mildew.

Emerson - comparable to Pennscott.

Wegener, Cumberland - below average in yield, longevity and disease resistance.

O.A.C. Selections - Common Selection showed good yield potential but rather poor longevity. While very susceptible to mildew it was quite resistant to anthracnose. The Delaware Selection showed considerably less promise.

Commercial - In yield and longevity the showing made was very poor. See Comments in the Regional Strain Trials.

The Canadian group - Some very encouraging results were obtained in this group. Leon, however, was below average. For notes on Dollard, Ottawa, Lasalle and Redon refer to the Regional Strain Trials.

General Conclusion (based only on this test)

- A. The varieties considered worthy of further testing are: Dollard, Ottawa, Lasalle, Redon, Pennscott, Wisconsin.
- B. Varieties appearing to be unworthy of further testing are:
English varieties, Midland, Cumberland, Wegener, Delaware, Leon.
- C. Borderline cases: Emerson, Common Selection, Kenland.

Rod Clover Regional Strain Trials

R.P.O.: F.H. 10-3

Year Initiated: 1953, 1954

For a description of these tests and for data collected previously see the 1954 issue of Progress Report, Forage Crop Investigations. The tables that are presented in the present report include some of these data as well as data collected in 1955.

Discussion

Yield:- No one variety is consistently superior to any other one over the entire province or indeed in any particular area. As an example the two lowest yielding strains in the hay harvest of the plots seeded at Guelph in 1953 were the two top yielding ones of the trials seeded in 1954.

The two items that show a relatively high degree of consistency are, first, that aftermath yields of Redon are low and second, that second year harvest yields of commercial red clover are low.

The variable results obtained with Redon and with commercial seed may be attributed in part at least to variability in seed lots.

Table 3:- Observations on Red Clover Strains in Regional Trials.

Variety	Spring vigor placings 18C	Percentage flowering				
		June 15/54 18C	June 10/55 18C	June 10/55 17D	June 15/55 Hespeler	Aug. 13/54 18C
Pennscott	1	30-35	50-70	30-50	40-60	60-80
Commercial	2	20-25	50-65	15-25	50-70	70-90
Lasalle	4	15-20	23-35	15-25	35-45	50-70
Ottawa	4	10-15	25-40	20-30	- -	20-40
Dollard	4	5-10	10-20	5-10	- -	15-25
Redon	6	0- 2	0- 5	5-15 10-30	25-40	0-10

Variety	Aftermath recovery July 14/54 18C	Ground cover May 5/55 18C	Mildew resistance Aug. 13/53 18C	Anthracnose resistance June 10/55 18C	Protein Percentage June '54 18C
Pennscott	Good	40-65	Fair	Poor	14.4
Commercial	Good	25-55	Fair	Good	15.0
Lasalle	Fair to Good	70-80	Fair	Fair	16.0
Ottawa	Good	65-90	Fair	Fair	15.4
Dollard	Fair	65-85	Good	Good	16.0
Redon	Poor	65-85	Poor	Good	16.7

Table 4:- Regional and Screening Strain Trials in Red Clover,
Seeded 1953 in 18C, O.A.C.

Yield of Dry Matter in Tons per Acre

Variety		June 1954	August 1954	Total 1954		June 1955	Total 1954-5
Dollard	R*	2.80	0.66	3.46		1.60	5.06
	S	2.84	0.49	3.33	3.40	1.38	4.71
Lasalle	R	2.70	0.63	3.33		1.36	4.69
	S	2.84	0.49	3.33	3.33	1.17	4.50
Ottawa	R	2.45	0.71	3.16		1.60	4.76
	S	2.60	0.54	3.14	3.15	1.16	4.30
Pennscott	R	2.85	0.70	3.55		0.86	4.41
	S	2.88	0.63	3.51	3.53	0.68	4.19
Redon	R	2.41	0.40	2.81		1.27	4.08
	S	2.75	0.41	3.16	2.99	0.92	4.08
Common	R	2.56	0.78	3.34		0.78	4.12
	S	2.30	0.58	2.88	3.11	0.37	3.25
L.S.D. 5% R		0.21	0.11	0.30		0.15	
1% R		0.30	0.15	0.41		0.21	

*R - Regional

S - Screening

Table 5:- Regional and Screening Strain Trials in Red Clover, 1954.
Yield of Dry Matter in Tons per Acre, or Rating in 1955

Strain	Hay-June Cutting			Aftermath Rating*
	17D	Hespeler	Lynn	17D
<u>Double Cut</u>				
Redon B	3.30	1.65	1.54	B-8
Kenland	3.27			A-2
Commercial	3.13	1.63	1.65	B-9
Wisconsin	3.10			B-6
Dollard	3.08			A-4
Pennscott	3.07	1.93	1.62	A-1
Ottawa	3.06			A-4
Redon I	3.04			B-7
Lasalle	2.94	1.50	1.71	A-2
<u>Single Cut</u>				
Leon	3.25			C-10
Thomas	3.18			D-12
Altaswede	3.14	1.42		D-11
Alaskland	2.50			D-12

* AI is slightly superior to A2, considerably superior to B6, etc.

Table 6:- Summary. Tons D.M. per Acre of Red Clover Strains.

Variety	Seeded at Guelph 1953			Average of 5 trials in first har. yr.* Hay (June)
	Hay + Aftermath 1954	Hay (June) 1955	2 Year Total	
Dollard	3.5	1.6	5.1	-
Lasalle	3.3	1.2	4.5	2.2
Pennscott	3.5	0.7	4.2	2.3
Kenland	3.1	0.9	4.0	-
Can. Commercial	3.1	0.4	3.3	2.2
Dorset Marl (English)	3.1	0.1	3.2	-
English Broad (English)	2.8	0.1	2.9	-

* 2 trials at Guelph and one at Kemptville, Hespeler and Lynn.

Table 7:- Tons D.M./Acre of Red Clover Strains seeded in 1953.
Average Over Guelph and Kemptville.

	<u>Hay + After.</u> <u>1954</u>	<u>Hay</u> <u>(June) 1955</u>	<u>Total</u>
Dollard	3.6	1.8	5.4
Lasalle	3.4	1.5	4.9
Pennscott	3.6	1.2	4.8
Can. Commercial	3.3	1.0	4.3

Table 8:- Red Clover + Timothy Trial - 10A, 1954.

	Yield in Tons per Acre June 1955	Estimated Average Percent Legume Sept. 1955
Pennscott + Timothy	3.46	42-50
Common "	3.28	23-30
Redon "	3.16	32 -40
Lasalle "	3.14	35-45

Comments:

The aftermath growth was so little that weights were not taken.

Seedings in 1955

R.P.O.: F.H. 10-15, 16, 17. Year Initiated: 1955

Three strain trials and one observational plot were seeded in section 16C. The strain trials were laid down in four replicates according to a randomized block design. A list of varieties follows.

10-15 Double cut type - 14 strains.

Pennscott	Bogle I	Wisconsin Mildew Resistant
Emerson	Bogle II	Wisconsin Polycross
Lasalle	Redon	Commercial I
Dollard	Purdue	Commercial II
Ottawa		Kenland

10-16 Single cut type - 7 strains

Mammoth	Thomas	N. Ontario I
Redon	Leon	N. Ontario II
Alaskland		

10-17 Redon - 7 strains

Idaho 1952	Brampton 1953 - second cut
Dunbar 1954	Brampton 1954 - first cut
Commercial	Brampton 1954 - early second cut
	Brampton 1954 - late second cut

The observational section consisted of 30 European strains or varieties including a number from Russia. Two replicates were sown for most strains and the plots were about 5' x 5'.

All seedings were made with a light cover crop of oats which were cut before maturity. The plots were irrigated during the summer and were cut back about Sept. 1. Establishment in general was good but a few plots were somewhat patchy. Some washing occurred at the lower side of the field.

Red Clover Nurseries

Three types of nurseries were established on 9D and two at the Isolation Farm.

1. Polycross nursery, 9D, using plants selected in 1954 from the nursery on 8B.
2. Clonal reserve nursery, 9D, for parental plants selected in 1954 from 8B.
3. Selection nursery 9D, of about 2600 plants of the varieties La salle, Pennscott and Commercial.
4. Increase and selection nursery, de Vos farm. The variety was Common Selection, a strain developed by Dr. McConkey. About 500 plants were planted.
5. Nectar and seed study, de Vos farm. About a dozen clones with 3-8 plants each were planted.

White Clover

B.E. Twamley

Strain Trials

R.P.O.: F.H. 10-11

Year Initiated: 1954

The white clover - ladino strain trial established on section 17D in 1954 suffered considerable damage during the winter of 1954-5. Two factors contributed. Some strains were not winter-hardy while many of the strains were damaged by ice cover which was the result of randomly distributed numerous small topographical irregularities. Variability within strains was thus very great.

Volunteer grasses invaded all plot but especially the less competitive strain. Morso and Lodi were particularly susceptible to this invasion. Separations were made where necessary in the yield trials.

In the accompanying tables the yields for the four cuttings are shown along with estimates of winter-kill.

Nurseries

R.P.O.: F.H. 10-19

Year Initiated: 1955

A selection nursery of about 300 individually spaced plants was set out on section 9D. Very heavy damage was caused by white grub attacks, mortality in some rows being over 80%. The varieties used were:

Pilgrim (Pennsylvania)

S100 (Aberystwyth)

POC 3 (Quebec)

Lodi (Denmark)

Common White (Idaho)

Kersey (England)

Polyploid (Vermont)

Ladino (Idaho)

White Clover Strain Trial 1954. 1955 Data

Strain	Yield in tons per acre					*Winter kill percentage	
	Cut 1	Cut 2	Cut 3	Cut 4	Mean	Range	Mean
West. Composite	0.94	0.78	0.53	0.78	3.03	1-50	20
Iowa ladino	1.06	0.81	0.36	0.51	2.74	2-20	8
Pilgrim-Penn.	0.97	0.78	0.28	0.66	2.69	1-15	6
Oregon ladino	1.03	0.82	0.26	0.55	2.66	2-10	4
California ladino	0.88	0.70	0.45	0.56	2.59	1-60	20
Idaho ladino	0.96	0.79	0.31	0.48	2.54	1-3	2
Montana ladino	0.94	0.78	0.32	0.45	2.49	2-40	17
POC3-Quebec	0.93	0.73	0.19	0.56	2.41	0-5	2
Kersey-England	0.94	0.60	0.31	0.47	2.32	2-30	14
Polyploid	0.74	0.60	0.34	0.55	2.23	0-25	10
Morso-Denmark	0.79	0.62	0.09	0.60	2.10	2-4	3
New Zealand	0.87	0.58	0.23	0.42	2.10	2-10	6
Lodi-Denmark	0.82	0.54	0.19	0.40	1.95	1-8	3
S-100 Aberyst.	0.82	0.59	0.17	0.37	1.95	1-10	3
Commercial	0.85	0.63	0.14	0.33	1.95	1-3	2
Common	0.73	0.60	0.12	0.17	1.62	2-10	4
Pathfinder	0.84	0.50	0.18	0.18	1.50	0	0
Louisiana	-	-	-	-	-	50-90	70
Mean	0.83	0.67	0.26	0.47	2.30		

* In the main damage was due to ice cover rather than to low temperature. However Louisiana was not winter hardy. Western Composite, California ladino and Kersey suffered more than the average.

Birdsfoot Trefoil

B.E. Twanley

Regional Strain Trials

R.P.O.: F.H. 9-1

Year Initiated: 1953

Seedings were made at Guelph and Kemptville. Stands at the O.A.C. were quite thin and so badly infested with grasses as to be useless for a yield trial. The Kemptville stands were satisfactory and yields were taken that same year and in 1954 and 1955. The results are shown in the accompanying table.

R.P.O.: F.H. 9-2

Year Initiated: 1954

Seedings were made at Guelph, Hespeler and Lynn. Stands were variable. The Guelph plots were cut three times, those at Lynn in June only. The plots at Hespeler established poorly and soon became very weedy. They were not harvested. The results of the Guelph and Lynn cuttings are shown in the tables.

Birdsfoot Trefoil Varieties at Kemptville
Tons D.M. per Acre. Two Year Average

	<u>Hay</u>	<u>Aftermath</u>	<u>Total</u>
Viking	1.66	1.54	3.20
Empire	1.59	1.50	3.09
European	1.83	1.29	3.12

Observation Plots

These plots seeded on 10A in 1954, were not replicated and neither in 1954 or 1955 received irrigation water. The V-belt was used for seeding and stands were good. Yields taken on some of the rows are shown in the tables.

Some of the characteristics of the varieties are listed below:

Viking - early, upright, medium tall, sturdy, dark green.

French, Italian - early, upright, tall.

Montour - early, upright, medium tall, light green.

Roskilde - medium early, upright, medium tall.

Jokioinen - medium early, upright, tall.

Empire - late, semi-decumbent.

Narrow leaf - late, decumbent.

The four strains of Empire were true to type but strain 360 was somewhat more upright than the others.

Observation Plots - 18C

R.P.O.: F.H. 9-1

Year Initiated: 1953

Early

Medium-early

Medium

Late

European

Viking

Cascade

Empire

Zoor

Vermont

Granger

Narrow leaf

Guilderland

New Seeding - Strain Trials

R.P.O.: F.H. 9-3

Year Initiated: 1955

A variety strain trial was seeded on May 5 in section 16C under a light cover crop of oats. The trial included 10 varieties replicated four times and the design was a randomized block. Irrigation was used and establishment in general was quite satisfactory except in the varieties Empire and Hudson which were rated as fair and poor respectively. A list of varieties follows along with gradings on establishment based on number and vigor of seedlings as of May 30.

<u>Variety</u>	<u>Establishment</u>	<u>Variety</u>	<u>Establishment</u>
Granger	Excellent	Viking	Good to excellent
Italian	"	Zoar	" "
Montour	Good	Roskilde	Fair to good
Guilderland	"	Empire	Fair
French	"	Hudson	Poor

Selections

About 50 plants were selected from 1, 2 and 3 - year old plots. The basis was purely one of vigor and size relative to the neighbouring plants. These were transferred to the greenhouse where studies in self-fertility will be conducted during the winter.

Sweet Clover Strain Trial, 1954

B.E. Twamley

R.P.O.: F.H. 10-12

Year Initiated: 1954

A strain trial was seeded on 17D in 1954. Establishment was poor and only small sample strips were harvested. Some data follow:

<u>Variety</u>	<u>Tons D.M. per acre</u>	<u>Stem Size</u>
Spanish	2.34	very coarse
Common yellow	2.17	medium
Evergreen	2.15	medium coarse
A 46	2.11	medium
S 65	2.10	coarse
Brandon Dwarf	2.09	fine
Madrid	1.89	medium
Erector	1.84	coarse
N 1	1.44	fine
Arctic	--	fine

Miscellaneous Legume Projects

B.E. Twamley

Seeding Date

Alfalfa, red clover, sweet clover and birdsfoot trefoil were seeded on section 1A at two different dates in 1954. Although no yield data were collected in 1955 the plants on the plots seeded in May, 1954, were very considerably more vigorous than those on the plots seeded in August, 1954.

Establishment of Birdsfoot Trefoil by Band-seeding

Stands of birdsfoot trefoil seeded in 1953 and 1954 were unsatisfactory. In 1955 the strain trial was broadcast in the normal fashion. In addition two varieties were band-seeded with a shoeless V-belt on top of 3-24-12 fertilizer drilled in at the rate of 300 lb./acre. Both types of seeding were irrigated and cut back in the same way.

Mulching for Establishment

The addition of straw to broadcast plots of legumes provided superior establishment to that provided by raking alone or by raking followed by the addition of straw. The data indicate that where irrigation is not possible the addition of a straw mulch may assist in the establishment of birdsfoot trefoil.

Table 1:- Introductions, Birdsfoot Trefoil at Hespeler, 1949.

G.L.I. No.	Strain	Source	Relative Worth*	Ave. 3 yrs. 1949-51	Remarks
40-39	F.C. 23, 417	Beltsville	6.5	6.6	
-40	F.C. 23, 429	"	5.0	5.7	
-41	Kaellingstand	Roskilde	7.0	6.7	Early & good 2nd growth
-80	Bunker	Cornell	6.0	6.2	
-81	Empire	"	6.5	6.2	
-82	V-102	"	7.0	6.1	
-83	E-491	"	6.5	5.9	
-84	E-492	"	5.5	5.5	
-85	E-493	"	5.5	5.5	
-86	E-494	"	5.5	5.5	
-97	E-495	"	5.5	5.5	
-101	Wienstephan	Germany	5.5	5.5	
49-93	B.N. 5489	Beltsville	6.5	6.0	
-102	uliginotus	Sweden	2.0	3.0	
-94	B.N. 5233 uliginotus	Beltsville	1.0	2.5	

* relative worth 1 (poor) to 10 (good)

Table 2:- Introductions, Grass Nurery, Hespeler, 1952

G.G.I. No.	Strain	Source	Bloom June 27	R.W. Ave. 3 yr. 1953-56	Remarks
<u>Timothy</u>					
-	Common		50	4.7	
-	Medon	Danish Plot 10	15	6.7	
-	Paton	Boyd's #1 Plot 7	15	7.0	
-	Medon	21 A 10 '50	5	6.7	
-	Paton	3 A 10 '50	2	7.4	
-	F.C.I. 15, 167	4 A 6 '50	2	6.0	
-	F.C.I. 19, 499	6 A 9 '50	1	6.1	
-	Hopkins Very Late	10 A 13 '50	1	6.5	
-	Hopkins Very Late	10 A 7 '50	0	7.2	Very late & leafy
-	Paton	3 x 7 '49	10	7.0	
-	Omnie P.I.162,582	4 A 4 '49	1	6.4	
-	Hopkins F.C.23,137	7 A 13 '49	0	6.9	
-	Climax	17 A 20 '49	40	6.9	
-	Drummond	18 A 10 '49	5	7.0	
-	F.C.I. 28, 119	22 A 12 '49	2	6.5	
51-221	French	Strasbourg	75	4.7	(Productive but weak stem)
52-246	Omnia	Svalof, Sweden	5	6.7	
-255	T.41	" "	4	5.2	
-256	Kampe II	" "	15	6.0	Low type
-264	Engmo	Oslo, Norway	0	3.0	
-265	Alpin Type	" "	0	2.7	
-266	F364	" "	10	4.5	
-267	Bodin	" "	10	4.3	
-268	Vagones	" "	20	4.6	
-277	Otofte IIa	Roskilde, Denmark	10	4.9	
-	Gartons		0	?	Low past. type
-307	Itasca	St. Paul, Minn.	40	5.5	
-333	Syn. 1A	Cornell	40	6.7	More leafy
-334	Syn. 1B	"	25	6.4	
-335	Syn. 1C	"	0	6.0	More stock
<u>Orchard</u>					
-	Common			5.0	
-	Oron	Corstorphine CCl		6.2	
-	Oron	15A 21 '50		6.4	
50-166	Isolation, Plot 3	16A 20 '50		5.3	
-168	Isolation, Plot 5	18A 9 '50		5.3	

G.G.I. No.	Strain	Source	R.W. Ave. 3 yr. 1953-45		Remarks
50-174	Gartons' Eng. Leafy #337	2A '50	6.5	Good basal leaves	
-175	Garton's Eng. Leafy #333	22A 9 '50	6.6	" " "	
-176	Garton's Eng. Leafy #913	23A 4 '50	6.5	" " "	
49-21	Tardus	32A 12 '49	6.3		
-145	S143	40A 11 '49	5.8		
-145	S143	40A 20 '49	5.4		
-120	S26	41A 13 '49	5.6		
51-219	Germany	Earlingan, Germany	5.2		
-236	Hispahica	Florence, Italy	0.7	Winter killed	
52-247	Brage	Weibull, Sweden	6.7	#4 plant sel.	
-257	Tardus II	" "	6.6	#7 " "	
-262	Aschersoniana	Canberra, Austrailia	4.0		
52-273	Aschersoniana	Hungary	3.7		
-302	Gartons	England	6.3	Good basal leaves	
-285	S 26 (Pasture Hay)	Aberystwyth	6.3	" " "	
-286	S 37 (Hay)	"	6.3	" " "	
-287	S143 (Pasture)	"	6.3		
-312	Wisconsin	Madison, Wisc.	4.9	Coarse stemmy	
-278	Roskilde	Denmark	5.9	(Basal leaves	
-336	Syn. 1A	Cornell	5.5	(remains green	
-337	Syn. 1B	Cornell	5.6		
<u>Meadow Fescue</u>					
-	Common		4.7		
-	Mefon	Norway Plot 80 '35	6.3		
-	M.A.C.	34 A 9 '50	6.7		
-	Tammisto II	35 A 11 '50	6.7		
50-177	Garton's Eng.	38 A 5 '50	7.5	Very leafy	
-	Mefon	53 A 8 '49	6.7		
49-45	Otofte I	56 A 19 '49	6.7		
-46	Mimer (Weibull)	57 A 3 '49	6.5		
-49	Steinbacher	59 A 13 '49	6.1	Coarser than Mefon	
52-263	Elatior	Canberra, Australia	3.7	(Very tall & coarse-persistent	
-280	Otofte	Denmark	6.3		
49-99	Ensign	C.E.F.	5.9	Stemmy	
51-240	Tabou	Czeckoslovakia	5.8	Stemmy prostrate	
52-248	Sena	Svalof, Sweden	5.7	Stemmy upright	

G.G.I. No.	Strain	Source	R.W. Ave. 3 yr. 1953-45	Remarks
52-259	Mimer	Svalof, Sweden	5.8	Fairly leafy
-261	Prague	Czechoslovakia	5.6	Tall, coarse
-288	S.53 (Pasture)	Good Aberystwyth	6.0	Shorter, leafier
-289	S.215 (Hay)	)basal "	5.9	Stemmy
-303	Garton's	)leaves England	6.7	Very leafy
<u>Red Fescue</u>				
-	Common		5.0	
-	Refon	Svalof, 121 Plot 82, '35	6.7	
-	Refon	41 A 10 '50	6.7	
-	U.S.D.A.	42 A 5 '50	6.6	Fine stems
-	Aberystwyth	43 A 8 '50	4.7	" " low leaf
-	M.A.C. 150	44 A 3 '50	5.9	Tall, fair leaf
-	Duraturf	45 A 15 '50	5.3	Leafy at base
50-193	Wisconsin 84	46 A 17 '50	6.0	Leafy at base
51-239	French	Verrienes, France	5.1	Fine
52-249	Viking	Svalof, Sweden	5.5	Fine
-290	Aberystwyth S59	Wales	5.3	Fine & spindly
<u>Bromegrass</u>				
-	Common		5.3	
-	O.A.C. #1	Increase Block '36	6.7	
50 -171	Martin	29 A 16 '50	6.0	Coarser
-	Syn. F32A	31 A 5 '50	6.8	Leafy
-	Moscow	5 A 1 '49	6.8	Good plants
-	Ukraine	6 A 1 '49	6.2	
-	N. Caucasus	7A 6 '49	5.7	Not so productive
51-337	Tabou	Czechoslovakia	5.7	Tall stemmy
52-311	B 86	Madison, Wisc.	5.5	" "
-313	Lyon, FC 23842	Bureau Entomology, Wash.	4.8	" "
-314	Lancaster, F.C. 23843	" " "	4.9	" "
-315	Bl2, F.C. 23844	" " "	5.2	" "
-316	Mandan 404, F.C. 23847	" " "	5.1	More leaf
-317	Homesteader, F.C. 23849	" " "	5.0	Tall stemmy
-318	Oko. #1, F.C. 23955	" " "	5.0	" "
-319	Sanburg, F.C. 24209	" " "	5.3	" "
-320	Can. Com. F.C. 24481	" " "	5.0	" "
-321	Martin, F.C. 24342	" " "	5.5	More leaf
52-322	Fischer, F.C. 24365	Bureau Entomology, Wash.	5.0	Tall coarse
-323	Elsberry, F.C. 24366	" " "	5.1	More leaf
-324	Achenbach, F.C. 24341	" " "	4.3	Very coarse
-325	Lincoln, F.C. 24466	" " "	4.7	Tall stemmy
-326	Manchar, F.C. 24469	" " "	5.6	Finer, leafy
-327	Okla, Syn., F.C. 24465	" " "	5.3	Fair leaf
-328	Syn. 2A	Cornell	5.0	Tall stemmy

G.G.I. No.	Strain	Source	R.W. Ave. 3 yr. 1953-56	Remarks
52-329	Syn. 2B	Cornell	5.3	More leaf
-330	Syn. 2E	"	5.3	Finer
-331	Syn. 2H	"	5.0	Tall stemmy
-332	Syn. 2G	"	5.2	More leaf
<u>Reed Canary Grass</u>				
-	Common		5.0	
-	O.A.C.		6.0	
-	Common	61 A 19 '50	5.7	
-	O.A.C.	62 A 3 '50	5.7	
-	F.C. 23008	63 A 3 '50	5.7	
f1-241	Tabou	Czechoslovakia	4.7	
52-338	Syn. 1A	Cornell	5.3	More leaf
-339	Syn. 1B	"		)Leafy. All 3
-340	Syn. 1C	"		)are good.
-341	Syn. 1D	"		)
<u>KentuckyBlue Grass</u>				
-	Common		4.7	Early, wire stems
-	Kenon	Danish, Plot 46, '35		Mixed with common
-	Kenon	43 A 10 '49	"	" " "
-	Kenon	43 A 14 '49	5.7	Uniform leafy
49-29	Primo	46 A 18 '49	5.3	" "
-140	Wiesenripe	48 A 19 '49	4.0	Upright, pale col.
-140	Wiesenripe	48 A 13 '49	4.9	rusty - some
50-183	McGill-Smith	51 A 7 '50	5.8	Wide leaved plants
51-209	Polish	Warsaw, Poland	4.0	Leafy
52-243	French	Verrienes, France	4.0	Wire stems
-244	Tylking	Svalof, Sweden	5.3	" "
-245	Skandia, II	" "	4.0	Leafy
<u>Canada Blue Grass</u>				
-	Common		5.0	
-	Canon	Common, Plot 42, '35	5.8	
-	Canon	48 A 12 '50	5.8	
-	Chieftain	50 A 3 '50	6.1	
52-279	Otofte	Sweden, Svalof		This is Kentucky
51-233	Pumila	Goteborg, Sweden	2.0	Dwarf Alpine type
-235	Versicolor	" "	2.0	Fine, upright, green
-232	Alpina	" "	1.0	Rosett, broad leaves
-210	Polish	Warsaw	3.0	dark green
				Wide basal leaves
				few coarse stalks.

G.G.I. No.	Strain	Source	R.W. Ave. 3 yr. 1953-56	Remarks
<u>Red Top</u>				
-	Common		5.0	
-	Reton	Common, Plot 121 '35	5.8	
-	Reton	81 A 21 '49	6.0	Leafy
-	Common	80 A 21 '49	6.0	Leafy
49-81	Oberhaunstadter	82 A 20 '49	5.3	Pale leafy
51-227	French	Verrieres, France	4.7	
<u>Tall Oat</u>				
-228	French (gigantea)	Verrieres, France	5.0	
52-271	Tenuis	Oslo, Norway	6.8	(Dark green leaf (Very early & good
<u>Perennial Rye Grass</u>				
-	Common		5	
-	Peron	Jaedersk, Plot 125 '34	7	
-	Peron	55 A 8 '50	5	
-	Common	54 A 5 '50	7	
50-178	Hunsballe	56 A 16 '50	6.2	Leafy
-179	Kent Indigenous	57 A 15 '50	6.5	Leafy
52-250	Viktoria	Svalof, Sweden	5.6	
-258	Weibull El	" "	7	
-276	Hungarian	edgreccen-Pallag	6.7	
-281	Otofte II	Denmark	6.7	
-	Garton's		8	Very leafy, best
-292	Hay-Pasture	Aberystwyth	6	
-293	Hay	"	5.5	
-291	S 23 Pasture	"	7	
<u>Italian Rye Grass</u>				
-	Common		0	Killed 80%
50-187	Garton's Leafy	52 A 16 '50	6	
-188	Garton's Perennialized	53 A 11 '50	5	
-	Garton's		3	
<u>Agropyron Spp.</u>				
49-86	Elongatum	58 A 11 '49	5	Coarse
-108	Elongatum BN 5197	59 A 7 '49	4	"
-111	Trackyculeum	63 A 8 '48	5.5	Finer
<u>Elymus Junceus</u>				
59-95	340-47	80 A 9 '49	3	Tuft of basal leaves
-157	Sask. S 114	81 A 5 '49	2	"

G.G.I. No.	Strain	Source	R.W. Ave. 3 Yr. 1953-56	Remarks
<u>Inter-Specific Crosses</u>				
49-43	Vernal EXA. inter	68 A 12 '50	6	Fairly leafy
-44	Vernal XA. elongatum	69 A 19 '50		
-45	T.Torgidum x Intermedium	70 A 10 '50	5	some good plants
-46	Kharkov X A.	71 A 12 '50	4.5	
-47	Kharkov X A elongatum	72 A 9 '50	4	Leafy & bearded
-49	Chinese X elong. x Yarslof	73 A 3 '50	6	
-48	Minturki x Inter X Minturki	74 A 3 '50	5	Good heads
-50	D.G.C. x elong. x Comp. Plot	75 '50	5	Good heads
<u>Canada Lyme Grass</u>				
-	Mandan F.C. 23308	77 A 7 '49	6	Leafy
-	Mandan B.N. 5277	78 A '49	5	Stemmy-basal leaf
<u>Virginia Lyme Grass</u>				
-	BN 5202	79 A 8 '49	7	Very leafy. A good selection very uniform.

Table 3:- Grass Introductions, 1954. Section D., Range 8.

Species	Source	% Rust	% Bloom	Leaf	R.W.	Remarks
		30/6/55	27/6/55			
<u>Timothy</u>						
Grin.E422 Syn.	Wexelsen, Norway	45	2	5	5	
Grin.E536 Syn.	"	40	10	6	7	
Grin.E543 Syn.	"	50	15	5	5	
Otofte II	Roskilde	5	5	5.5	6	
Kampe II	Weibull	20	40	5	5	
T 41	"	2	0	5	5.2	Broad leaves
Omnia	Svalof	2	2	7	7.1	
Common	Comp. 4 lots of Ont	25	40	4.5	5	
Medon	O.A.C	2	25	6.5	6	
Tarmo	Jokioinen	25	5	5.5	5.2	
Tammisto	"	40	20	6	6	
Leafy Past.	Gartons	0	10	9	8	Late & leafy
1952-1	Hoffddorp	0	1	8	7	Late, leafy
1952-2	"	0	0	8	7	late, leafy more upright than Gartons
<u>Bluegrass</u>						
Otofte 1	Roskilde	20	10	3	2	
Atlas	Svalof	25	8	3	2	Very interesting
*Tyking	"	2	16	6	5	contrast in
Common	Doughty McFarlane	25	7	3	2	these strains
*Kenon	O.A.C.	5	14	7	6	"Kenon" and "Tyking" are best.
Skandia II	Svalof	5	8	3	2	
Primo	Weibull Seeds	4	12	6	4	
Gunson	London, Eng.	10	8	5	4	
Merion	Penn. State	25	5	4	3	
<u>Orchard</u>						
Rosk. Late II	Roskilde	5	9	5	5	Leaf spot
Roskilde II	"	5	10	5	5	
*Jo-D-70A	G-168 Jokioinen	5	12	7	8	Late leafy
Garton's Leafy	Garton's Eng.	4	12	7	5	Not winter hardy
Aschersoniana	Upsula	5	12	7	7.5	
Common	Comp. 4 lots of Ont.	15	9	6	6	
*1949-8	Hoofddorp	5	13	8	7.8	Fine, late, leafy
1949-17	"	4	12	7.5	7.5	" " "
1949-18	"	4	11	7	7.2	" " "
1949-26	Hoofddorp	5	12	7.5	7.2	
1948-3	"	5	11	7.3	7	

Species	Source	% Rust 30/6/55	% Bloom 27/6/55	Leaf R.W.	Remarks
<u>Fescue</u>					
Otofte 2 M.F.	Roskilde	2	Late	6	7
Otofte Early II	"	10	Early	6	7
Mimer	Weibull	4	Early	6.5	7
Sena	Svalof	7	Early	6	6
Common	Comp. 4 lots of Ont.	10	Early	6.5	6.5
* Mefon	O. A.C.	4	Late	7	7.5
Paave	Jokioinen	5	Late	6.5	7
* Tammisto	"	6	Late	7	7
* Garton's Leafy	Garton	2	Late	8	8
<u>Perennial Rye Grass</u>					
* Otofte Late	Roskilde		Late	8	9
Otofte Early	"		M. Early	6	5
Viktorina	Svalof		Late	6	5
Viris	Weibull		M. Early	6	7
* Garton's Leafy Pas.	Garton's		M. Early	7	8
Garton's Dua-Purp.	"		M. Early	5	7
Common	Doughty-McFarlane		Early	4	5
Com. Italian	"		1 Plant	6	- 99% winter killed
N.Z. Cert.	McGill-Smith		Early	4	4
Westerwoldicum	"		-	-	- 100% " "
1949-1 Hay	Hoofddorp		M. Late	6	7
1949-4 Hay	"		M. Late	6	7
1949-5 Past.	"		Late	7	8.7
1949-8 Past.	"		Late	7	8.6
<u>Sweet Clover</u>					
* O.A.C. #1	S.C. (Yellow)	June 13-'55	15% bloom	8	9
* O.A.C. #1	S.C. (White)	July 4-'55	5% " "	7	8 Very late

* best strains

Table 4:- Clover Introductions, 1954. Section D, Range 8.

Species	Source	Per Cent Bloom	R.W.	Remarks
Molstad	Vollebekk, Norway	Late	5	Rabbits defoliated
R.T.E. Tetraploid	"	"	7	" "
Otofte III, Early	Roskilde, Denmark	M. Early	5	" "
Otofte III, Half late	"	Late	6	" "
R-11	Weibull	"	6	" "
Resistanta	"	"	7	" "
Weibulls' Tetra.	"	"	6	" "
Common	Doughty McFarlane	June 20	4	" "
Redon	O.A.C.	Early 30%	7	" "
* Lasalle	C.E.F., Ottawa	M. Early	7.2	" "
Thomas G-241	Fredericton N.B.	Late	6.5	" "
S-123	Aberystwyth	"	6	" "
Morker	Svalof	"	5	" "
Tammisto	Jokioinen	"	5	" "
<u>Alsike</u>				
20/6/55				
Otofte	Roskilde	50	7	
Weibull's Tetra	Weibull	20	8	
Common	Doughty McFarlane	50	7	
Alon	O.A.C.	55	7	
* Polycross O.A.C.		55	9	
Tammisto	Jokioinen	20	6	
<u>White Clover</u>				
Morso-Otofte	Roskilde	20	6	
Wild-Eng. Otofte	"	25	6	
Nora	Weibull	40	7	
Robusta	"	30	7.5	
Common	Doughty McFarlane	30	5	
* Tammisto	Jokioinen	40	9	Good strain
Pasture 50-3	Hoofddorp	30	8	
Pilgrim	Beltsville	25	7	
<u>Alfalfa</u>				
Jokioisten	Jokioinen	5	7	
* Alfa	Weibull	5	6.9	Promising
Grimm	Doughty McFarlane	5	6	
* Vernal	Madison, Wisc.	10	7	Best
Mitteldeutsch	Beltsville	2	6	

* best strains