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Recent Legume Variety Trials in South Dakota

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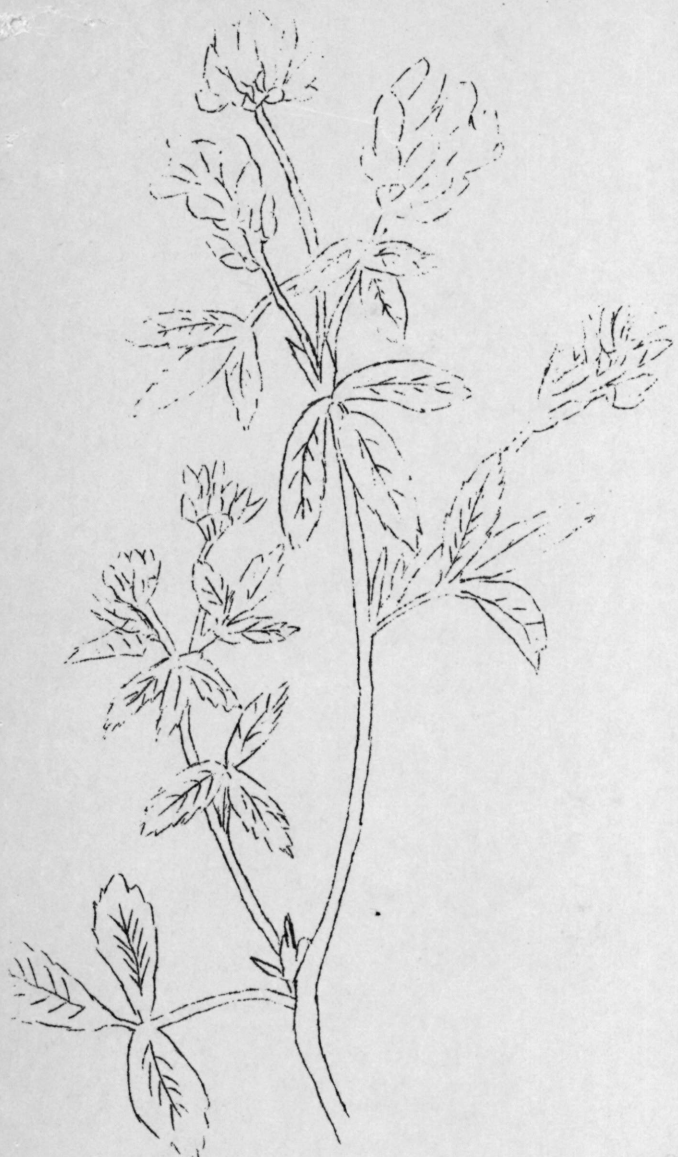
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Pamphlet 51
July, 1959



RECENT LEGUME VARIETY TRIALS

in

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Recent Legume Variety Trials in South Dakota

by

M. D. Rumbaugh and R. A. Moore^{1/2/}

Varietal tests of the more important forage legume species are conducted on a continuing basis as a part of the forage legume breeding project of the Agronomy Department of the South Dakota Agricultural Experiment Station. While these tests are rather restricted in size and distribution, they do attempt to provide impartial evaluation of the varieties most apt to be widely used in the state. Test locations are, for the most part, concentrated in the areas where these species are used most extensively or where they are well adapted.

Recent results with alfalfa, sweetclover, red clover, and birds-foot trefoil are included in this report. The tests were located in the vicinities of Brookings, Highmore, Menno and Watertown.

The data presented should be interpreted with caution. In many cases they are limited to one or a few years. Differences in winter-hardiness, resistance to diseases and insects, and in quality of forage may not be revealed by short term yield figures. These results are of a preliminary nature and inclusion of a variety in the tests does not indicate that it is recommended for use in South Dakota. A list of legume forage varieties eligible for certification and recommended for use within the state will be found in table 21.

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^{2/} The authors wish to extend their appreciation to Dr. M. W. Adams, formerly Agronomist, South Dakota Agricultural Experiment Station, Brookings, for much of the data presented.

Table 1. Alfalfa Variety Test at the Main Experiment Station, Brookings. Seeded 1948.
Harvested 1949, 1951, 1952 and 1953.

Variety	1949		1951		1952		1953 1/	Cumulative Average		Total
	1st cut	2nd cut	1st cut	2nd cut	1st cut	2nd cut		1st cut	2nd cut	
Atlantic	3.88	3.21	1.94	1.18	2.14	1.19	2.26	2.56	1.86	3.95
Buffalo	2.98	2.48	1.78	1.32	1.92	1.20	2.33	2.25	1.67	3.50
Grimm	4.46	2.70	2.03	1.16	1.66	1.23	2.28	2.61	1.70	3.88
Kansas Common	4.08	2.20	1.66	1.22	1.52	1.28	2.29	2.39	1.57	3.56
Ladak	5.11	2.92	2.15	1.31	2.17	1.19	2.49	2.98	1.81	4.34
Narragansett	4.80	3.05	2.23	1.24	2.17	1.02	2.42	2.90	1.77	4.23
Oklahoma Common	3.74	2.61	1.54	1.34	1.57	1.08	2.39	2.31	1.68	3.57
Ranger	4.30	2.39	1.97	1.28	1.91	1.14	2.03	2.55	1.60	3.76
Williamsburg	3.54	2.92	1.73	1.29	1.89	1.06	2.37	2.38	1.76	3.70
Average	4.10	2.72	1.89	1.26	1.88	1.15	2.32	2.55	1.71	3.83

1/ Only one cutting obtained.

Table 2. Alfalfa Variety Test at the Main Experiment Station, Brookings. Seeded 1950. Harvested 1951, 1952, 1953 and 1954.

Variety	$\frac{1951}{1st\ cut} \frac{1}{/}$	Tons of dry forage per acre			$\frac{1953}{1st\ cut} \frac{1}{/}$	$\frac{1954}{1st\ cut} \frac{1}{/}$	Average seasonal Total
		1st cut	2nd cut	Total			
Atlantic	0.78	2.40	1.14	3.54	2.07	1.47	1.96
Du Puits	0.70	2.27	1.21	3.48	1.74	1.38	1.82
Ladak	0.97	2.91	0.95	3.86	2.00	1.73	2.14
Narragansett	0.84	2.52	1.19	3.71	1.98	1.48	2.00
Nomad	0.79	2.12	0.80	2.92	1.87	1.40	1.74
Ranger	0.75	2.36	1.03	3.39	1.92	1.40	1.86
Sevelra	0.77	2.25	1.10	3.35	2.10	1.51	1.93
South Dakota Common	0.74	2.50	1.19	3.69	2.07	1.62	2.03
Talent	0.63	2.00	1.06	3.06	1.81	1.11	1.65
Williamsburg	0.72	2.26	1.13	3.39	1.95	1.48	1.88
Average	0.77	2.36	1.08	3.44	1.95	1.46	1.90

$\frac{1}{/}$ Only one cutting obtained.

Table 3. Red Clover Variety Test at the Main Experiment Station, Brookings. Seeded 1951. Harvested 1953.

<u>Variety</u>	<u>Tons of dry forage per acre</u>
Dollard	1.56
Emerson	0.95
Kenland	0.72
Libel	1.26
Mammoth	1.19
Midland	0.90
Ottawa	1.08
Rahn	0.96
Scott	0.65
Van Fossen	0.79
Wegener	1.10
Average	1.01
L. S. D. (0.05)	0.32

Table 4. Sweetclover Variety Test at the Main Experiment Station, Brookings. Seeded 1952. Harvested 1953.

<u>Variety</u>	<u>Tons of dry forage per acre</u>	<u>Height at Harvest</u>	<u>Blackstem score</u> ^{1/}
Artic	3.15	48"	5.0
Brandon Dwarf	3.56	31"	5.0
Common white	3.47	73"	4.0
Common yellow	3.68	62"	5.0
Evergreen	4.02	85"	3.0
Madrid	3.40	55"	4.0
Spanish	3.90	70"	4.5
Average	3.60	61"	4.4
L. S. D. (0.05)	.47		

^{1/} 1 = resistant
5 = susceptible

Table 5. Yields and Nitrogen Production of Sweetclover Varieties at the Main Experiment Station, Brookings. Seeded 1954. Harvested 1954.

Strain	Tops			:	Roots			: Total
	:Tons :per A.	:Percent :nitrogen	:Lbs. N :per acre	: Lbs.	:Percent :nitrogen	:Lbs. N :per acre	:Lbs. N :per acre	
Spanish	2.28	2.99	136.34	2929	2.99	87.58	223.92*	
Willamette	1.79	2.75	98.45	1861	2.77	51.55	150.00	
Common White	0.81	3.13	50.71	2377	3.04	72.26	122.97	
Common Yellow	0.97	3.09	59.95	2671	2.69	71.85	131.80	
Com.Yel. Sel.	1.32	2.85	75.24	2443	2.76	67.43	142.67	
Madrid	1.70	2.93	99.62	2533	2.48	62.82	162.44	
Evergreen	1.68	2.87	96.43	2604	2.86	74.47	170.90	
Wis. A46	1.48	2.71	80.22	2605	2.58	67.21	147.43	
N1	1.57	3.02	94.82	1627	3.02	49.14	143.96	
N7	1.51	3.09	93.32	1560	3.14	48.98	142.30	
N9	1.30	2.98	77.48	1597	3.14	50.15	127.63	
<u>M. wolgica</u>	1.12	3.39	75.94	984	2.69	26.47	102.41	
<u>M. taurica</u>	0.52	2.97	30.89	798	3.08	24.58	55.47	
Israel	2.41	2.48	119.54	1200	1.02	12.24	131.78	
Hubam	1.80	2.64	95.04	480	0.64	3.07	98.11	

* Data from one replication only.

Table 6. Yields of Tops and Roots of Sweetclover Varieties at the Main Experiment Station, Brookings. Seeded 1954. Harvested 1953.

Strain	1955 data - pounds of dry matter per acre					
	: May 5, 1955		: June 16, 1955		: Sept. 1, 1955	
	: Roots	: Tops	: Roots	: Tops	: Roots	: Tops
Spanish	480.2	828.3*	2040.7*	5653.9*	1320.4*	5161.7*
Willamette	1272.4	822.3	1746.6	4219.7	696.2	5233.8
Common White	1602.5	1320.4	1824.6	3283.1	893.3	4045.4
Common Yellow	2586.9	1776.6	2700.9	5419.8	432.1	4705.6
Com. Yel. Sel.	2022.7	1560.5	1668.6	4909.6	540.2	5779.9
Madrid	1500.5	780.3	1686.6	4003.3	576.2	3577.2
Evergreen	1656.5*	708.2	2808.9*	4033.3*	1656.6*	5701.9*
Wis. A46	1182.4	696.2	2911.0	4867.6	972.3	3841.3
N1	1374.5	636.2	1152.4	1944.6	660.2	3493.2
N7	846.3*	144.0*	642.2*	1080.4*	564.2*	2280.8*
N9	1128.4	444.1	1152.4	1320.4	804.3*	3109.1*
<u>M. wolgica</u>	678.2	654.2	1716.6	4033.3	852.3	4141.4
<u>M. taurica</u>	522.2	702.2	1134.4	1842.6	552.2	2460.8

* Data from one replication only.

Table 7. Sweetclover Variety Test at the Main Experiment Station, Brookings. Seeded 1955. Harvested 1955.

<u>Variety</u>	<u>Tons of dry forage per acre</u>	<u>Tons of dry roots per acre</u>	<u>Height (inches)</u>
Common White	1.00	2.23	22
Common Yellow	1.09	2.26	14
Evergreen	1.02	3.29	29
Madrid	1.09	2.64	23
Spanish	1.08	4.14	28
Average	1.06	2.91	23
Golden (annual)	1.29	0.76	40
Israel (annual)	1.03	0.98	47
Average	1.16	0.87	44

Table 8. Sweetclover Variety Test at the Main Experiment Station, Brookings. Seeded 1958. Harvested 1958.

<u>Variety</u>	<u>Tons of dry forage per acre</u>
Common White	1.77
Common Yellow	1.98
Erector	0.80
Evergreen	2.42
Goldtop	2.04
Madrid	0.38
Spanish	1.93
Average	1.62
Floranna (annual)	7.53
Hubam (annual)	3.04
Israel (annual)	2.72
Average	3.99

Table 9. Birdsfoot Trefoil Variety Test at the Main Experiment Station, Brookings. Seeded 1951. Harvested 1952 and 1953.

<u>Variety</u>	<u>Tons of dry forage per acre</u>	
	<u>1952</u>	<u>1953</u>
Cascade	1.90	1.49
Empire	2.66	1.73
Granger	1.90	1.54
Mandan 1116	2.36	1.36
New York Narrowleaf ^{1/}	1.24	--
Oregon Narrowleaf ^{1/}	1.35	--
Viking	2.01	1.91
Average	1.92	1.61

^{1/} Winterkilled and not harvested in 1953.

Table 10. Alfalfa Variety Test at the Central Substation, Highmore.
Seeded 1956. Harvested 1957 and 1958.

<u>Variety</u>	<u>Tons of dry forage per acre</u>				<u>Average Total</u>
	<u>1957</u>			<u>1958</u>	
	<u>1st cut</u>	<u>2nd cut</u>	<u>Total</u>	<u>Total</u> ^{1/}	
Arizona Chilean	1.32	1.96	3.28	1.19	2.24
Buffalo	1.92	2.50	4.41	1.20	2.80
California Common	1.89	2.23	4.12	1.20	2.66
Cossack	2.34	2.51	4.85	1.16	3.00
Du Puits	2.30	2.65	4.95	1.50	3.22
Grimm	2.06	2.70	4.76	1.32	3.04
Ladak	1.89	2.19	4.08	1.51	2.80
Lahontan	1.41	1.96	3.36	1.24	2.30
Narragansett	2.01	2.70	4.72	1.33	3.02
Nomad	1.63	2.00	3.63	1.23	2.43
Ranger	1.94	2.76	4.70	1.44	3.07
Semipalatinsk	1.85	2.03	3.88	1.70	2.79
Vernal	2.10	2.17	4.26	1.57	2.92
Average	1.90	2.34	4.23	1.35	2.79

^{1/} Only one cutting was obtained in 1958.

Table 11. Alfalfa Variety Test at the Southeast Research Farm, Menno. Seeded 1956. Harvested 1957 and 1958.

Variety	1957			Tons of dry forage per acre			Cumulative Average		
	1st cut	2nd cut	Total	1958		Total	1st cut	2nd cut	Total
				1st cut	2nd cut				
Cossack	2.86	2.42	5.28	0.94	0.58	1.52	1.90	1.50	3.40
Du Puits	3.10	2.27	5.37	0.94	0.68	1.62	2.02	1.48	3.50
Grimm	2.26	2.16	4.42	1.06	0.58	1.64	1.66	1.37	3.03
Ladak	2.85	2.30	5.15	1.01	0.42	1.43	1.93	1.36	3.29
Lahontan	2.37	2.14	4.51	0.88	0.60	1.48	1.62	1.37	3.00
Narragansett	2.77	2.40	5.17	1.22	0.54	1.76	2.00	1.47	3.46
Nomad	2.55	1.89	4.44	0.81	0.42	1.23	1.68	1.16	2.84
Ranger	2.72	2.58	5.30	1.00	0.59	1.59	1.86	1.58	3.44
Rhizoma	3.10	2.16	5.25	1.12	0.56	1.68	2.11	1.36	3.46
Terra Verde	2.72	2.64	5.36	1.06	0.73	1.79	1.89	1.68	3.58
Teton	2.74	2.08	4.83	0.74	0.26	1.00	1.74	1.17	2.92
Vernal	2.78	2.33	5.12	1.32	0.68	2.00	2.05	1.50	3.56
Average	2.74	2.28	5.02	1.01	0.55	1.56	1.87	1.42	3.29

Table 12. Red Clover Variety Test at the Southeast Research Farm,
Menno. Seeded 1957. Harvested 1958.

<u>Variety</u>	<u>Tons of dry forage per acre</u>	<u>Stand (%)</u>	<u>Height (Inches)</u>
Dollard	1.02	92	16
Kenland	0.97	95	16
La Salle	0.92	90	14
Pennscott	0.83	95	18
Stevens	0.82	95	16
Wisconsin Synthetic	0.92	90	16
Average	0.91	93	16
L. S. D. (0.05)	0.25		

Table 13. Sweetclover Variety Test at the Southeast Research Farm, Menno. Seeded 1956. Harvested 1957.

<u>Variety</u>	<u>Tons of dry forage per acre</u>
Common White	3.24
Common Yellow	4.48
Evergreen	3.72
Goldtop	4.41
Madrid	4.08
Spanish	4.42
Average	4.06

Table 14. Sweetclover Variety Test at the Southeast Research Farm, Menno. Seeded 1957. Harvested 1958.

<u>Variety</u>	<u>Tons dry forage per acre</u>	<u>Stand (%)</u>	<u>Height (Inches)</u>
Evergreen	2.63	90	53
Goldtop	2.54	94	47
Intermediate Coumarin	2.57	92	44
Madrid	1.27	90	38
Spanish	2.39	94	46
Average	2.28	92	46
L. S. D. (0.05)	0.28		

Table 15. Birdsfoot Trefoil Test at the Southeast Research Farm,
Menno. Seeded 1957. Harvested 1958.

<u>Variety</u>	<u>Tons of dry forage per acre</u>	<u>Stand (%)</u>
Cascade	0.66	80
Empire	0.82	94
French Imported	0.79	92
Granger	0.77	91
Iowa Empire 2297	0.16	85
Iowa Empire 2306	0.67	91
Italian Imported	0.74	95
Leofoil	0.38	92
Mansfield	0.62	86
South Dakota #9	0.12	92
Tana	0.84	91
Viking	1.01	85
Average	0.63	90
L. S. D. (0.05)	0.27	

Table 16. Alfalfa Variety Tests at the Northeast Research Farm, Watertown. Seeded 1956. Harvested 1957 and 1958.

Variety	Tons of dry forage per acre								
	1957			1958					
	Ist cut	2nd cut	Total	Ist cut	2nd cut	Total			
				Cumulative Average					
	Ist cut	2nd cut	Total	Ist cut	2nd cut	Total			
Cossack	2.58	1.18	3.76	1.62	1.06	2.68	2.10	1.12	3.22
Du Puits	2.88	1.01	3.89	1.44	1.26	2.70	2.16	1.14	3.30
Grimm	3.04	1.02	4.06	1.43	1.20	2.63	2.24	1.11	3.34
Ladak	3.53	1.20	4.74	1.69	1.10	2.79	2.61	1.15	3.76
Lahontan	2.20	0.56	2.76	0.99	0.70	1.69	1.60	0.63	2.22
Narragansett	3.11	1.14	4.25	1.74	1.14	2.88	2.42	1.14	3.56
Nomad	2.93	0.55	3.48	1.40	0.82	2.22	2.16	0.68	2.85
Ranger	2.84	1.22	4.06	1.50	1.07	2.57	2.17	1.14	3.32
Rhizoma	3.00	0.62	3.62	1.48	0.87	2.35	2.24	0.74	2.98
Terra Verde ^{1/}	-----	-----	-----	-----	-----	-----	-----	-----	-----
Reton	3.25	0.93	4.18	1.55	0.91	2.46	2.40	0.92	3.32
Vernal	3.15	1.29	4.44	1.89	1.24	3.13	2.52	1.26	3.78
Average	2.96	0.97	3.93	1.52	1.03	2.55	2.24	1.00	3.24

^{1/} Winterkilled and excluded from averages.

Table 17. Red Clover Variety Test at the Northeast Research Farm, Watertown. Seeded 1956. Harvested 1957 and 1958.

Variety	Tons of dry forage per acre									
	1957			1958			Cumulative average			
	Ist cut	2nd cut	Total	Ist cut	2nd cut	Total	Ist cut	2nd cut	Total	Total
Commercial Common	2.03	0.72	2.75	3.66	1.52	5.18	2.84	1.12	3.96	3.96
Commercial Mammoth	2.51	0.47	2.98	4.52	0.98	5.51	3.52	0.72	4.24	4.24
Dollard	3.12	0.78	3.90	5.61	1.64	7.26	4.36	1.21	5.58	5.58
Kenland	2.23	0.87	3.10	4.02	1.83	5.85	3.12	1.35	4.48	4.48
La Salle	2.68	0.81	3.50	4.83	1.65	6.48	3.76	1.23	4.99	4.99
Pennscott	3.00	0.78	3.78	5.40	1.64	7.04	4.20	1.21	5.41	5.41
Wegener	3.12	0.93	4.05	5.61	1.96	7.58	4.36	1.44	5.82	5.82
Wisconsin Synthetic	2.77	0.84	3.62	4.99	1.52	6.26	3.88	1.18	4.94	4.94
Average	2.68	0.78	3.46	4.83	1.59	6.40	3.76	1.18	4.93	4.93

Table 18. Red Clover Variety Test at the Northeast Research Farm,
Watertown. Seeded 1957. Harvested 1958.

<u>Variety</u>	<u>Tons of dry forage per acre</u>
Dollard	1.74
Kenland	1.14
La Salle	1.60
Pennscott	1.11
Stevens	1.06
Wisconsin Synthetic	1.50
Average	1.36
L. S. D. (0.05)	0.42

Table 19. Sweetclover Variety Tests at the Northeast Research Farm, Watertown. Seeded 1956, 1957, and 1958. Harvested 1957 and 1958.

<u>Variety</u>	<u>Tons of dry forage per acre</u>		<u>Average</u>
	<u>1957</u>	<u>1958</u>	
Brandon Dwarf	2.70	----	----
Common White	4.73	----	----
Common Yellow	5.54	2.06	3.80
Evergreen	4.99	1.96	3.48
Goldtop	5.72	1.83	3.78
Intermediate Coumarin	----	1.73	----
Madrid	5.65	1.54	3.60
Spanish	5.10	1.79	3.44
Average	4.92	1.82	3.62
Hubam (annual)	----	1.10	----
Israel (annual)	----	1.21	----
Average	----	1.16	----

Table 20. Birdsfoot Trefoil Variety Test at the Northeast Research Farm, Watertown. Seeded 1957. Harvested 1958.

<u>Variety</u>	<u>Tons of dry forage per acre</u>
Cascade	0.61
Douglas	0.59
Empire F.C. 32080	1.04
Granger	0.45
Imported	0.46
Iowa Empire 2297	0.70
Iowa Empire 2306	0.99
Mansfield	0.74
Tana	0.64
Viking	0.72
Average	0.69
L. S. D. (0.05)	0.34

Table 21. A listing of those forage legume varieties eligible for certification and recommended for use in South Dakota in areas where they are adapted.

Alfalfa Varieties:

1. Ladak
2. Ranger
3. Teton
4. Vernal

Red Clover Varieties:

1. Dollard

Sweetclover Varieties:

1. Goldtop
2. Madrid

Birdsfoot Trefoil Varieties:

1. Empire