

Potassium Sources for Soybeans.

Dr. Joe Omielan, Nova Scotia Agricultural College, Truro, NS B0N 1C0. (902) 893-6032
First annual report to PPI, March, 1999

Little Ontario research has been done on soybean potassium (K) needs. The relative chloride sensitivity of Ontario cultivars has not been tested. The objectives of this project were to determine whether chloride or magnesium applied with K fertilizers influence soybean response to K, and to determine whether Ontario soybean varieties differ in response to K and sources of K. Ten selected soybean cultivars were evaluated for response to muriate of potash, sulfate of potash, and sulfate of potash magnesia in an on-farm trial in Rodney, Ontario. The field selected had a high level of K fertility. The sulphate sources of K tended to produce higher yields, but the differences were not significant. We conclude that chloride sources do not pose a problem for soybeans, but further research is needed to optimize K nutrition of soybean on soils of lower fertility.

For 1999, the project is to be transferred to Agriculture and Agri-Food Canada at Harrow, Ontario. A similar experiment will be carried out on soil with a lower potassium status.

S77: Evaluation of Soybean Responses to K Fertilizers

Rodney, 1998

Main Plot Means

	n	kg/ha	Stand (pl/m ²)	Height	100 Seed	% Oil	% Protein
Check	40	2153	46	71	18.5	21.2	42.5
Muriate of Potash (90 lb/ac K ₂ O)	39	1764	43	61	17.7	21.2	42.7
Muriate of Potash (180 lb/ac K ₂ O)	39	1940	43	67	18.5	21.3	42.1
Sulfate of Potash (90 lb/ac K ₂ O)	39	2162	44	62	18.0	21.2	42.2
Sulfate of Potash-Magnesia (90 lb/ac K ₂ O)	35	2071	43	66	18.1	21.2	42.1
F-Test		<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>

Variety Means

S 19-90	19	1891	44	64	19.4	21.2	42.9
OAC Bayfield	18	1835	40	63	19.0	21.4	42.6
OAC Shire	19	1701	45	58	15.6	21.6	42.7
S 18-11	19	2657	45	67	22.5	20.0	44.3
Westag 97	20	2118	44	63	18.4	21.7	40.1
Sterling	20	2225	43	70	16.2	21.7	41.2
CX232	18	2210	43	61	17.4	21.0	43.2
HS 3168	19	1808	42	62	18.2	21.2	42.9
A1923	20	2019	47	65	17.9	21.6	41.7
9242	20	1712	43	78	17.0	20.7	42.1
F-Test		*	*	*	*	*	*
K Fert. X Variety		<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>

Variety

Variety	n	kg/ha	Stand (pl/m ²)	Height	100 Seed	% Oil	% Protein
S 19-90	4	1855	48	74	19.2	21.2	42.8
OAC Bayfield	4	1761	42	63	18.7	21.6	42.5
OAC Shire	4	1788	45	53	16.0	21.5	43.1
S 18-11	4	2777	47	71	23.5	19.7	45.2
Westag 97	4	2603	49	74	18.4	21.9	39.9
Sterling	4	2359	45	76	16.5	21.7	41.1
CX232	4	2569	48	67	18.0	21.0	43.5
HS 3168	4	1942	44	72	18.4	21.1	43.0
A1923	4	2088	47	70	18.4	21.7	41.7
9242	4	1784	44	86	17.6	20.6	42.5
S 19-90	4	1370	44	56	18.8	21.3	43.4
OAC Bayfield	3	1809	40	60	18.7	21.4	43.0
OAC Shire	4	1295	44	66	14.4	21.7	43.0
S 18-11	4	2806	42	62	22.8	20.0	44.6
Westag 97	4	1875	42	60	18.4	21.2	41.4
Sterling	4	1669	42	62	15.5	21.9	41.3
CX232	4	1882	41	60	17.6	21.1	43.4
HS 3168	4	1599	42	53	17.5	21.0	43.6
A1923	4	1530	46	57	17.2	21.6	42.2
9242	4	1811	43	77	16.5	21.2	41.4

S 19-90	Muriate of Potash (180 lb/ac K2O)	4	1791	42	68	19.5	21.2	42.9
OAC Bayfield	Muriate of Potash (180 lb/ac K2O)	4	2073	40	68	19.9	21.2	42.7
OAC Shire	Muriate of Potash (180 lb/ac K2O)	4	1853	41	67	16.0	21.6	42.7
S 18-11	Muriate of Potash (180 lb/ac K2O)	3	2200	45	67	23.6	19.9	44.1
Westag 97	Muriate of Potash (180 lb/ac K2O)	4	1814	41	60	19.2	22.0	39.4
Sterling	Muriate of Potash (180 lb/ac K2O)	4	2717	43	82	17.0	21.7	40.8
CX232	Muriate of Potash (180 lb/ac K2O)	4	2014	40	60	17.2	21.0	43.0
HS 3168	Muriate of Potash (180 lb/ac K2O)	4	1439	41	59	17.8	21.5	42.5
A1923	Muriate of Potash (180 lb/ac K2O)	4	2165	50	70	18.3	21.5	41.6
9242	Muriate of Potash (180 lb/ac K2O)	4	1398	44	74	17.4	20.8	41.9
S 19-90	Sulfate of Potash (90 lb/ac K2O)	4	2210	43	57	19.6	21.2	42.7
OAC Bayfield	Sulfate of Potash (90 lb/ac K2O)	4	1761	38	61	18.9	21.6	42.2
OAC Shire	Sulfate of Potash (90 lb/ac K2O)	4	1793	45	52	15.6	21.6	42.7
S 18-11	Sulfate of Potash (90 lb/ac K2O)	4	2918	46	68	20.9	20.0	43.5
Westag 97	Sulfate of Potash (90 lb/ac K2O)	4	2221	43	59	18.2	21.8	39.8
Sterling	Sulfate of Potash (90 lb/ac K2O)	4	2353	44	68	15.7	21.6	41.5
CX232	Sulfate of Potash (90 lb/ac K2O)	3	2227	45	53	16.6	20.9	43.3
HS 3168	Sulfate of Potash (90 lb/ac K2O)	4	1915	42	58	19.6	21.0	43.3
A1923	Sulfate of Potash (90 lb/ac K2O)	4	2477	47	70	17.6	21.4	41.7
9242	Sulfate of Potash (90 lb/ac K2O)	4	1765	45	71	17.1	20.5	42.2
S 19-90	Sulfate of Potash-Magnesia (90 lb/ac K2O)	3	2342	42	67	20.3	21.1	42.8
OAC Bayfield	Sulfate of Potash-Magnesia (90 lb/ac K2O)	3	1741	41	64	18.5	21.4	42.5
OAC Shire	Sulfate of Potash-Magnesia (90 lb/ac K2O)	3	1799	50	55	15.9	21.8	42.1
S 18-11	Sulfate of Potash-Magnesia (90 lb/ac K2O)	4	2470	44	69	22.0	20.2	43.9
Westag 97	Sulfate of Potash-Magnesia (90 lb/ac K2O)	4	2076	44	63	17.8	21.9	40.0
Sterling	Sulfate of Potash-Magnesia (90 lb/ac K2O)	4	2026	41	64	16.2	21.5	41.5
CX232	Sulfate of Potash-Magnesia (90 lb/ac K2O)	3	2413	43	61	17.5	21.1	42.5
HS 3168	Sulfate of Potash-Magnesia (90 lb/ac K2O)	3	2257	41	69	17.6	21.6	41.9
A1923	Sulfate of Potash-Magnesia (90 lb/ac K2O)	4	1833	45	60	18.2	21.6	41.5
9242	Sulfate of Potash-Magnesia (90 lb/ac K2O)	4	1800	38	83	16.5	20.3	42.8

Preplant Soil Analysis

NH4 (mg/kg)	11.06
NO3 (mg/kg)	4.34
P (mg/L soil)	21
K (mg/L soil)	190
Mg (mg/L soil)	163
pH	6.8
Organic Matter (%)	3.6
S (%)	0.028

Nematode Analysis (No./kg soil)

J2 Cyst	ND	Soybean Cyst	(No./100 g soil)
Dagger	ND	Cyst	4
Lance	ND	Eggs	332
Root Lesion	ND		
Pin	ND		
J2 Root Knot	50		
Stem & Bulb	ND		
Spiral	90		
Stunt	60		
Other	ND		