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SOYBEAN VARIETY CHOICES FOR INCREASED RESISTANCE TO PENDIMETHALIN HERBICIDE

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Stem breakage and lodging near the soil line are reoccurring problems for soybean in Kansas. These are among the symptoms of a condition known as brittle bean syndrome, which is associated with use of pendimethalin herbicide (Prowl, Squadron, and Pursuit Plus) and suitable environmental conditions (wet during and following emergence). Stem breakage/lodging is of economic concern and may occur any time during the growing season.

Soybean varieties vary in resistance to pendimethalin. Varieties less adversely affected should be planted when pendimethalin is used. This study was undertaken to identify varieties with increased levels of resistance.

Procedures

One-hundred eleven soybean varieties were studied at the Agronomy Research Farm near Manhattan, KS, and at the East Central Experiment Field near Ottawa, KS for their response to pendimethalin herbicide-induced stem damage (brittle bean syndrome). Varieties were grown on untreated control plots or treated with 1 and 3 lb/per acre rates of pendimethalin and scored near harvest for percent stem breakage (0=no breakage, 100=all plants broken). Soils were a fine sandy loam at Manhattan and a silt loam at Ottawa, Rainfall and temperatures at Manhattan were normal, with

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adequate precipitation for timely activation of the herbicide. Rainfall at Ottawa was delayed for 14 days; thus, emergence occurred before activation of the herbicide.

Results

Reactions of the public and private soybean varieties tested are given in Table 1. Results are presented for both location and herbicide rates, because the varieties responded differently in the two environments. These data cover released varieties available to the public or experimental lines nearing release and of interest to producers.

The most susceptible varieties included Essex, KS5292, Stafford, Delsoy 4900, and Hutcheson. Some of the most resistant varieties were Probst, Asgow A4715, Flyer, and Agripro AP 3727.

Conclusions

No soybean variety appeared to have complete resistance to pendimethalin. However, many of the commercial varieties expressed little or no damage to pendimethalin under the environmental conditions of our study. These resistant varieties offer increased plant protection and higher yield potential when g-own in a cropping system using pendimethalin herbicide.

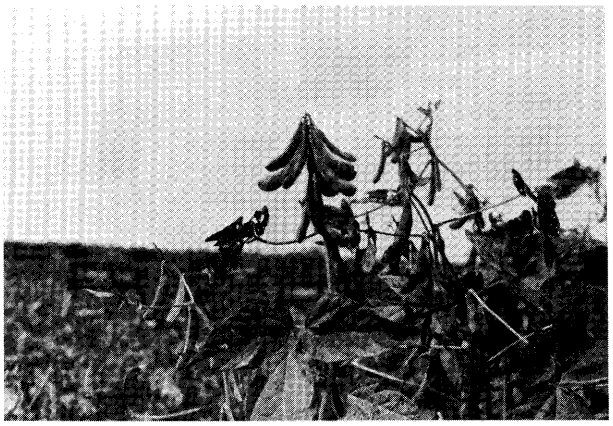

Table 1. Evaluation of soybean varieties grown at two locations and treated with two rates of pendimethalin for percent stem breakage.

		Manhattan		Ottawa	
Brand	Entry	1.0 lb\ac	3.0 lb/at	1.0 lb/at	3.0 lb/at
		%			
AgriPro	AP 3727	0	3	0	3
AgriPro	AP 3800	0	5	1	1
AgriPro	AP 3990	0	8	1	10
AgriPro	AP 4100	0	8	1	18
AgriPro	AP 4510	0	6	2	8
AgriPro	AP 4880	3	4	0	6
Asgrow	A3313	1	3	1	8
Asgrow	A351O	0	5	0	10
Asgrow	A3935	1	5	2	6
Asgrow	A4045	0	4	3	11
Asgrow	A4138	0	9	0	9
Asgrow	A4341	0	4	1	15
Asgrow	A4415	1	5	3	18
Asgrow	A4715	0	1	1	5
Asgrow	A5112	0	4	5	9
Dekalb	CX335	1	5	0	10
Dekalb	CX377	0	5	1	9
Dekalb	CX404	1	6	3	11
Dekalb	CX411	1	1	4	6
Dekalb	CX445	1	4	1	5
Dekalb	CX458	1	4	1	4
Dekalb	CX469c	1	5	2	11
Delta Pine	DP 3375	0	1	3	5
Delta Pine	DP 3456	0	15	0	8
Delta Pine	DP 3478	0	3	1	10
Delta Pine	DPX 3358	1	8	3	13
Delta Pine	DPX 3381	1	12	3	9
Delta Pine	DPX 3388	3	4	1	8
Delta Pine	DPX 3432	0	8	0	14
Delta Pine	DPX 3391	1	10	0	8
ICI	D371	1	5	0	5
ICI	D396	0	4	1	10
ICI	D414	0	14	4	10
ICI	D454	1	10	0	9
ICI	EX4484	4	6	1	9
NC+	3A44	0	4	0	6
NC+	3K84	0	6	1	10
NC+	4A1O	0	4	1	10
NC+	4A27	3	9	1	11
NC+	5A15	0	9	4	16
NC+	5H61	3	10	4	25
Northup King	S29-39	0	5	1	6
Northup King	S30-06	0	3	1	9
Northup King	S35-35	1	6	1	10
Northup King	S39-41	0	4	0	15
Northup King	S42-50	2	5	0	5

Brand	Entry	Manhattan 1.0 lb/at	Manhattan 3.0 lb/ac	Ottawa 1.0 lb/at	Ottawa 3.0 lb/at
		%			
Northup King	S42-60	3	6	1	15
Northup King	S46-44	1	19	3	19
Northup King	S52-25	1	12	4	7
Pioneer	9341	1	1	0	9
Pioneer	9362	1	6	1	3
Pioneer	9381	0	5	0	7
Pioneer	9391	3	9	1	14
Pioneer	9393	0	4	0	11
Pioneer	9394	3	8	3	6
Pioneer	9411	1	14	0	13
Pioneer	9491	5	10	4	28
Pioneer	9521	0	8	3	15
Stine	3260	0	6	0	8
Stine	3470	0	5	8	5
Stine	3490	0	5	0	9
Stine	3510	0	3	3	11
Stine	3630	4	6	0	6
Stine	3660	0	8	1	9
Stine	3680	3	9	1	14
Stine	4340	1	13	1	10
Stine	4350	1	4	3	13
Stine	4680	0	13	3	6
Stine	4390	0	8	1	10
Stine	4322CN	0	8	1	6
	Avery	3	19	8	11
	Corsica	0	5	0	9
	Crawford	0	3	1	6
	Delsoy 4210	3	8	4	8
	Delsoy 4500	3	5	3	13
	Delsoy 4710	0	5	3	11
	Delsoy 4900	0	14	6	38
	Edison	0	5	0	13
	Essex	1	31	8	51
	Fayette	1	9	1	10
	Flyer	0	5	1	4
	Forrest	0	3	2	6
	Hamilton	0	6	0	6
	Hartwig	0	5	0	5
	Holladay	0	12	4	8
	Hutcheson	0	19	5	31
	K1213	2	6	0	12
	K1218	0	5	1	9
	K1231	0	10	3	9
	K1235	3	9	0	6
	K1261	0	3	1	5
	K1262	2	5	1	3
	K87-7-95 EXP.	10	41	9	15
	K88-22-42 EXP.	13	24	4	41
	Kenwood	1	6	1	11
	KS3494	1	5	5	4
	KS4390	0	10	3	26

Brand	Entry	Manhattan 1.0 lb/at	Manhattan 3.0 lb/at	Ottawa 1.0 lb/at	Ottawa 3.0 lb/at
		%			
	KS4694	0	3	3	9
	KS4895	1	3	1	8
	KS5292	1	10	8	49
	KY88-5037	0	4	4	9
	Kunitz	1	6	3	5
	Linford	3	10	1	10
	Manokin	1	5	0	14
	Probst	0	0	0	5
	Resnik	0	6	1	8
	Sherman	0	6	3	8
	Sparks	6	13	3	11
	Stafford	1	25	6	33
	Stressland	0	13	3	5
	Williams 82	1	1	3	6
LSD (5%)		3	10	4	13

Note: Trade names are used to identify products; no endorsement is intended, nor is any criticism implied of similar products not mentioned.

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