

Report to the Oregon Processed Vegetable Commission

1987

1. Project Title: Corn head smut resistance
2. Project Leader: J. R. Baggett
3. Project Status: Terminating June 30, 1988
4. Project Funding for Reporting Period: \$3,000.00
5. Objectives:
 - a) Test Plant Introduction lines and other germplasm sources for high field resistance to head smut.
 - b) Determine if immunity or true seedling resistance exists in germplasm sources.
 - c) Test commercial F₁ hybrids and inbreds for head smut resistance.

6. Report of Progress:

A total of 150 lines and varieties of corn, including 32 commercial varieties and 118 Plant Introduction lines, were tested for resistance to head smut. Infection ranged from 2% to 52% in commercial varieties, with Jubilee averaging 37% in clipped plots (Table 1). Plant Introduction lines ranged from 0 to 100% infection (Table 2). Eleven PI lines were 0% infected. Of the 11 uninfected lines, 2 were repeats of lines having 0% in 1986. Two lines which were 0% in 1986 had some infection in 1987. Further testing of all lines having 0% infection in 1987 should be done to determine if they include lines more resistant than previously known material. It should be noted that N6, our standard control and previously the most resistant line we had, was 1.3% infected in 1987.

Six of the more resistant lines tested in 1986 were grown for seed in 1987 to provide an ample supply of seed for larger scale tests. Additional lines will be increased in 1988 because the Plant Introduction Station cannot supply the extra seed needed.

7. Summary:

None out of 32 commercial varieties and 11/118 plant introduction lines were uninfected when tested in 1987 in inoculated head smut plots. Seed increases were made of lines which need retesting, but two of the lines which were uninfected in 1986 contained infected plants in 1987. Jubilee had 37% infection and P.I. line infection was as high as 100%.

8. Signatures:

Submitted by:

Redacted for Privacy

Project Leader

Date

Approved by:

Redacted for Privacy

Department Head

Date

TABLE

Head Smut Infection in Sweet Corn Inbreds and Hybrids, Corvallis, Oregon, 1987¹

Code no.	Clipped					Not Clipped					Overall % AV Infection
	Total Plants		% Infection			Total Plants		% Infection			
	Rep 1	Rep 3	Rep 1	Rep 3	AV	Rep 2	Rep 4	Rep 2	Rep 4	AV	
1	27	41	33	71	52	36	31	50	32	41	47
2	33	30	18	30	24	25	29	4	31	18	21
3	15	17	20	24	22	24	31	29	48	38	29
4	25	35	16	34	25	25	36	16	8	12	19
5	28	15	57	20	38	14	23	21	17	19	29
6	38	28	24	25	24	35	37	20	16	18	21
7	26	36	4	3	4	27	34	4	0	2	3
8	31	22	26	45	36	23	32	30	12	21	28
9	24	21	17	38	28	10	8	30	38	34	31
10	21	27	33	15	24	28	17	20	18	19	23
11	23	24	9	21	15	21	15	5	27	16	15
12	26	23	4	0	2	25	35	12	0	6	4
13	19	21	0	5	2	22	17	9	6	8	5
14	29	34	14	6	10	26	29	4	0	2	6
15	42	34	5	6	6	31	35	3	0	2	4
16	32	40	16	8	12	20	36	5	3	4	8
17	26	27	12	11	12	28	39	7	10	8	10
18	28	24	29	38	34	23	27	30	48	39	36
19	34	30	26	23	24	21	21	19	24	22	23
20	28	24	29	12	20	26	31	19	52	36	28
21	27	24	11	25	18	25	30	16	30	23	21
22	30	28	17	7	12	25	30	8	13	10	11
23	28	21	11	48	30	24	28	17	7	12	20
24	30	26	43	38	40	20	27	30	22	26	34
25	26	30	8	17	12	28	36	14	19	16	14
26	28	30	11	13	12	25	30	24	3	14	13
27 Jubilee ²	36	38	42	32	37	32	37	12	16	14	26
28 Sugar Buns ²	37	34	3	6	4	31	30	6	3	4	5
29 Miracle	32	33	9	9	9	40	35	5	0	2	6
30 How Sweet It Is	27	29	41	55	48	30	36	23	14	18	33
31 Phenomenal	27	38	7	13	10	30	27	7	11	9	10
32 N6 ²	34	36	0	3	2	32	37	0	3	2	1
33 Earliglow	25	23	84	91	88	22	30	64	83	74	81

¹Planted May 27; rows 3 feet apart; plots 20 feet long. Mean infection for all varieties: clipped 22%, not clipped 18%. LSD at 5%: for overall variety means, 14%; for comparison of varieties within clipping or non-clipping, 20%; for comparison of clipping and non-clipping, all varieties combined, 3%. Interaction between clipping and varieties was not significant.

²Values shown (and included in analyses) for Jubilee, Sugar Buns, and N6 are averages of 2 plots in each replication.

TABLE 2

Head Smut Infection in Corn Plant Introduction Lines
Corvallis, Oregon, 1987¹

OSU #	PI #	Cultivar	Source	Type ²	Plant ³ Height (DM)	Total Plants	% ⁴ Infection
P101	162573	Black Mexican	Argentina	ST	18	39	10
P102	167947		Turkey	PP, RP	15	35	51
P103	168017		Turkey	RP	18	38	39
P104	168018		Turkey	FT	18	28	29
P105	168027		Turkey	RP, PP	13-18	35	34
P106	168032		Turkey	RP	13-16	33	42
P107	168033		Turkey	RP	12-15	38	39
P108	168055		Turkey	DT	18	31	32
P109	168056		Turkey	FT	15	39	33
P110	168062		Turkey	FT	21	16	94
P111	172330	Hickory King-Lg. Kernel	Australia	DT	19-24	30	7
P112	173830		Turkey	RP	15	41	37
P113	175976	Italian	Turkey	RP	14-16	34	12
P114	175981	Darisi	Turkey	FT	9-21	28	11
P115	177621		Turkey	FT, DT	12-18	29	34
P116	179566	Diken Dari	Turkey	RP, PP	8-15	39	41
P117	208473		Nepal	FT	21	40	12
P118	213734	Hopi Tribe		FR	10-15	39	8
P119	213737	Navajo Tribe		FR, FT	15	16	6
P120	213738	Navajo Tribe		FR	11-17	17	0
P121	213739	Navajo Tribe		FT, DT, FR	18	31	0
P122	213743	Cherokee Tribe		FR	18-24	28	25
P123	213746	Cheyenne Tribe		FR	18	27	0
P124	213749	Cheyenne Tribe		FR	19	35	17
P125	213761	Blackfeet	North Dakota	FT, FR, DT	17-23	19	26
P126	213762	Blackfeet	North Dakota	FT	10	29	59
P127	213769	Shoshoni Tribe	Idaho	FT, FR	10-13	31	6
P128	213770	Sioux Tribe	South Dakota	FR	13-17	33	0
P129	213775	Rainbow Flint	North Dakota	FT, FR	11-19	29	21
P130	213776	Northwestern Dent	North Dakota	DT	14-20	23	74
P131	213779	Blue Flour	South Dakota	FR	15	28	21
P132	213784	Dakota White	South Dakota	DT	13	38	34
P133	213786	Early Murdock	South Dakota	DT	18-24	39	8
P134	213787	Rainbow Flint	South Dakota	FT, DT	13	20	15
P135	213789	Wimples Yellow	South Dakota	DT	19	34	26
P136	213790	Dakota White Flint	North Dakota	FT	13-19	31	35
P137	213791	South Dakota Rainbow	North Dakota	FT, DT, FR	18	40	25
P138	213799	Zuni Blue	North Dakota	FR	12-16	39	3
P139	213800	Mandan Yellow Flint	North Dakota	FT, FR	9	18	22
P140	213801	Bear Island Chippewa	North Dakota	FT	12-15	36	22
P141	213802	Mandan White Flint	North Dakota	FT	9-12	37	5
P142	213805	Wild Goose	North Dakota	FT, DT	12-17	40	0
P143	213808	Mandan Red Flour	North Dakota	FR	12-18	20	90
P144	214203	Twitchells Pride	Canada	FT	14-16	27	70
P145	217464	Eight Row	New York	FT	12-18	27	89
P146	217475	Northern Wonder	New Jersey	DT	24-33	47	36

TABLE 2 (cont.)
 Head Smut Infection in Corn Plant Introduction Lines
 Corvallis, Oregon, 1987¹ (cont.)

OSU #	PI #	Cultivar	Source	Type ²	Plant ³ Height (DM)	Total Plants	% ⁴ Infection
P147	217477	Red Robin	New York	DT	18-24	36	47
P148	217482	Amber Flint	Colorado	FT	15	34	9
P149	218043		Netherlands	FT	13	35	63
P150	218161	Navajo Tribe	Arizona	FR	16-22	20	10
P151	218163	Navajo Tribe	Arizona	FR	9-18	34	26
P152	228183	Early Pearl	USSR	ST, FT	12-16	33	33
P153	231228	Dwarf Gaspe	Canada	FT	5-6	24	12
P154	231299	Oregon Evergreen	Minnesota	ST, FT	18	29	7
P155	233313	SD 176 Gold, Sunshine Sel	South Dakota	ST, FT	15	31	6
P156	233317	D592 Bloomcross Sel	South Dakota	ST, FT	12	32	9
P157	239107	Milicevicev	Yugoslavia	DT	21	29	45
P158	245130	Rhode Island Sweet	Arizona	ST, FT	15	33	9
P159	245131	Rhode Island Flint	Arizona	FT	21	34	41
P160	251653	Maximir Early	Yugoslavia	PT	16	26	4
P161	251881	Milovakaya	USSR	FT	9-15	28	68
P162	251894	Flint 98	USSR	FT, DT	8-11	23	65
P163	253811	K919	Iraq	FT	9-11	36	100
P164	254007	K1134	Syria	FT, DT	16	37	14
P165	255983	Pease Crosby	Maine	ST, FT	15	48	27
P166	262474	Sel. Far East Region	USSR	DT	18	28	29
P167	266968	Line 133A N. Cascasu	USSR	DT	18	28	7
P168	270090		Pakistan	FT, DT	17-19	39	8
P169	270092		Pakistan	FT, DT	15	36	39
P170	270288		USSR	FT	15	34	21
P171	279028	Norte Gordo Race	Spain	FT, DT	15	32	34
P172	279037	Pejo de Cuna	Spain	FT	16	36	53
P173	291387	Early Variety	China	FT, DT	16-24	33	12
P174	303854	Chernovitsky Dent	USSR	DT, FT	15	36	33
P175	303865	Angel of Midnight	Japan	FT	15-22	17	53
P176	303872	Sa Ka Shita	Japan	FT	12-18	30	23
P177	303879	White 8-row	Japan	FT	15	36	69
P178	303881	Black Corn	Japan	FT	12	13	23
P179	303882	Longfellow	Japan	FT, DT	15	26	4
P180	303884	Masuke Zai Rai	Japan	FT	12	36	81
P181	311249	Spanish Pop	Iowa	FT, PP	10-15	37	46
P182	311250	White Rice	Iowa	RP	15-19	29	0
P183	317680	Black Beauty	South Dakota	FR	9	34	15
P184	357118		Ethiopia	FT, DT	19-31	36	0
P185	358271	Domasen	Yugoslavia	RP	12-20	23	9
P186	358272	Mistna	Yugoslavia	RP, PP, DT	16-18	31	19
P187	358273	Bela	Yugoslavia	FT, PP, DT	16-22	27	33
P188	358275	Pukanka	Yugoslavia	RP, DT	18-22	29	7
P189	358276	Srpska Pukanka	Yugoslavia	FT, RP, DT	13-24	31	10
P190	358278	Bela Lokalna	Yugoslavia	PP, RP	12-18	34	29
P191	358279	Crvena Lokalna	Yugoslavia	RP, PP	11-19	26	65
P192	358281	Crvena Pukanka	Yugoslavia	RP	14-19	31	26

TABLE 2 (cont.)
 Head Smut Infection in Corn Plant Introduction Lines
 Corvallis, Oregon, 1987¹ (cont.)

OSU #	PI #	Cultivar	Source	Type ²	Plant ³ Height (DM)	Total Plants	% ⁴ Infection
P193	358546	Queixalet	Spain	DT, FT	15-21	31	39
P194	358547	Norteno	Spain	DT, FT	10-21	27	19
P195	358551	Emano Levantino	Spain	DT, FT	13-21	21	19
P196	358557	Cincantin	Rumania	PP, FT	9-17	28	36
P197	358560	Hinganesc	Rumania	FT, DT	11-18	28	93
P198	358563	Alb Moldovenesc	Rumania	FT	13-17	37	8
P199	358574	Dinte de Cal Tipi	Rumania	DT	17-25	38	18
P200	358579	Dinte de Cal Alb	Rumania	DT, FT	15-22	35	23
P201	411138	Small Seed	PRC	DT, FT	14-23	33	9
P202	411139	Small Seed	PRC	DT, FT	14-20	36	11
P203	414185	Old Wisconsin Red	Wisconsin	DT	15-19	45	4
P204	419225		South Carolina		27-31	39	10
P205	420051	Pozo Colorado Argentina I	Argentina	FT	27-36	45	16
P206	420244	Reventador	Arizona	PP	22-31	40	32
P207	420245	Chapalote	Arizona	FT	14-20	36	33
P208	420246	Blue Corn	Arizona	FR	12-16	25	12
P209	420247	Tawa °Ktci	Arizona	ST, FT	12-22	31	0
P210	420248	Pala °qua 3	Arizona	FR	10-18	32	81
P211	420249	Koko °ma	Arizona	FR	13-20	36	0
P212	420951		Jordan	PP		36	22
P213	213714	Papago Flour	Arizona	FR	21-27	24	8
P214	213730	Apache Tribe	Arizona	FR	15	20	0
P215	217410	Papago Flour Corn	Arizona	FR	21-27	16	38
P216	218130		New Mexico	FR	27	29	10
P217	340837		Iowa	RP	12-19	34	0
P218	358568	Romanesc	Illinois	FT, DT	12-21	28	25
N6						139	1
Jubilee						143	26
Earliglow						100	81

¹Planted May 27; rows 3 feet apart; plots 20 feet long. Values shown for N6, Jubilee, and Earliglow are totals of 4 plots.

²Seed type, shown in order of their predominance in the seed samples: DT = dent, FT = flint, FR = flour, ST = sweet, RP = rice pop, PP = pearl pop, PD = pod, SH = shrunken, and WS = waxy.

³Listed catalogue height.

⁴Seedlings clipped to increase % infection.