Report to the Oregon Processed Vegetable Commission
2006–2007

1. Title: Identification of High Yielding, Root Rot Tolerant Sweet Corn Hybrids

2. Project Leaders: James R. Myers, Horticulture

3. Cooperators: Brian Yorgey, Food Science and Technology
Cindy Ocamb, Botany and Plant Pathology

4. Project Status: Terminating 30 June, 2007

5. Project Funding: $13,521 total

Funds were used for a major portion of the support of a vegetable technician, student labor, supplies, processing plant evaluation of moisture content, and research farm expenses.

6. Objective: Identify sweet corn hybrids released for the processing market for high and stable yields under heavy and light root rot pressure.

7. Report of Progress:

We conducted three trials at two locations to evaluate sweet corn hybrids for performance under root rot conditions. While both sugar/se and supersweet sweet corn hybrids were evaluated, the emphasis was again on identifying supersweet hybrids with improved tolerance to root rot. Two locations (Vegetable Research Farm and Botany Farm) with moderately high root rot incidence were used. Both have had continuous corn for at least the past five years. While the Vegetable Farm field had no additional inoculum added, the Botany Farm field had had direct Fusarium inoculation and roots from infected fields added. Supersweet hybrids were grown in isolation on the Vegetable Farm root rot plots, while sugary hybrids were grown about a quarter mile distant on the Vegetable Farm on ground that has been rotated among various vegetable crops. Root rot severity was expected to be less, and it was, but sufficient root rot was present to evaluate cultivars (mean trial incidence was 93% at the Botany Farm, 96% in the supersweet trial at the Vegetable Farm, and 63% in the sugary Vegetable Farm trial. Trials in isolation at the Vegetable Farm allowed us to evaluate product quality in addition to yield under root rot conditions. At the Botany farm, supersweet and sugary types were grown together, and only yield was evaluated. The Vegetable farm trials consisted of four replicates with two row plots 30 feet in length, while only one row per plot was established at the Botany farm. At the Vegetable farm, one row of each plot was used to determine yield and for processing evaluation, while the other row was used for root rot evaluation and determining ear moisture. Hybrids were planted with a belt planter then thinned to normal stand (nine inch spacing on 30 in. rows). The Vegetable Farm supersweet and Botany Farm trials were both planted on June 22 while the Vegetable Farm sugary trial was planted a day later. Data collected included root rot on the primary, mesocotyl and adventitious roots, browning of the nodes, crown rot at harvest maturity, silking date, kernel moisture, and ear number and weight (including both cull and net weight). Kernel moisture was determined at the OSU Pilot Plant. Raw product evaluation was conducted on those hybrids for which seed company funding was obtained.

Hybrids evaluated in trials are show in table 1. Thirteen were supersweet and eleven were sugary types. Genotype by environment interaction was significant this year, but this was mainly due to the fact that sugary hybrids at the Vegetable Farm had a lower incidence of root rot and higher yields compared to the Botany Farm, whereas supersweet hybrids were subjected to similar levels of root rot and had similar yields at both locations. Average net yields were 7.1, 8.2, and 5.4 T/A, respectively for the Vegetable Farm supersweet, sugary, and Botany farm combined trials. Average yield was closely associated with a root rot incidence at each location. While Coho was the top sugary performer at both locations, GSS 1477 had again this year the highest net yield among supersweet types (Tables 2, 3 & 4, Figure 1) with ear quality superior to Supersweet Jubilee (Table 6).

While primary root infection approached 100% for most hybrids in the overall analysis, there were location differences with sugary hybrids at the Vegetable Farm showing 48-95% primary root infection (Figure 2). Primary root infection at the Botany Farm was not statistically significant, with the lowest value being 82%. For nearly all parameters, the check cultivars Coho (tolerant) and Jubilee (susceptible) showed relative ranking as expected. In the overall evaluation, two hybrids (179A and Protégé) had significantly less adventitious root rot compared to Coho, and 16 were significantly better than Jubilee (Table 7, Figure 4). Eight hybrids had significantly less adventitious root rot than Coho when Botany Farm was analyzed alone whereas 17 hybrids were better than Jubilee in this trial (Table 8). In the Vegetable Farm sugary trial, none of the hybrids were significantly lower in adventitious root rot compared to Coho, and only one was significantly worse (Table 9). Eight hybrids had significantly less adventitious root rot than Supersweet Jubilee in the Vegetable Farm supersweet trial. While primary root rot, mesocotyl root rot, and adventitious root rot appear to be related, they differ from symptoms of internal browning of nodes above the soil (Table 7-10, Figures 2-6). Coho had few symptoms of the latter parameter, but ranking of other hybrids differed compared to other root variables. Root worm damage was generally low this year, with highest readings found in the supersweet trial at the Vegetable Farm.

When root rot and yield parameters were subjected to correlation analysis several moderate to strong significant associations were observed in the analysis of the overall data set. Brown node was only weakly correlated with other root variables whereas crown rot showed stronger associations (Table 11). Other root parameters showed a high degree of correlation with one another. Gross and net yield were correlated with all rot parameters except root worm damage (Table 11). Ear diameter and kernel depth were correlated with yield. When trials were analyzed separately, correlations were weaker (Table 12-14).

Conclusions:

A number of hybrids appear to have better performance under root rot conditions than Jubilee and Supersweet Jubilee. In particular, GSS 1477 appears to be a very promising supersweet replacement. Data from this year exhibits a moderate negative relationship between root rot severity and yield.

Table 1. Sweet corn entries grown in trials on root rot infested ground at the Oregon State University Botany and Vegetable Research Farms in 2006.

Entry	Company	Type	Color
1183	Illinois Foundation Seed	sh2	yellow
1283	Illinois Foundation Seed	sh2	yellow
170A	Illinois Foundation Seed	sh2	yellow
179A	Illinois Foundation Seed	sh2	yellow
GSS 1477	Rogers	sh2	yellow
GSS 2914	Rogers	sh2	yellow
Marvel	Crookham	sh2	yellow
Protégé	Rogers	sh2	yellow
SS Jubilee	Rogers	sh2	yellow
SS Jubilee Plus	Rogers	sh2	yellow
XTH 1174	Illinois Foundation Seed	sh2	yellow
XTH 1182	Illinois Foundation Seed	sh2	yellow
XTH 1377	Illinois Foundation Seed	sh2	yellow
C2-28	Crookham	su	yellow
Coho	Harris-Moran (check)	su	yellow
Conquest	Crookham	su	yellow
Eliminator	Crookham	su	yellow
GH 4927	Rogers	su	yellow
GH 6223	Rogers	su	yellow
GH 6462	Rogers	su	yellow
GH 8267	Rogers	su	yellow
Jubilee	Rogers (check)	su	yellow
Jubilee C	Rogers	su	yellow
Tamarack	Crookham	su	yellow

Table 2. Yield and ear measurements for selected sweet corn hybrids grown in a root rot trial on the OSU botany research farm, Corvallis, 2006.[z]

Entry	Days to Harvest	Plants /Plot (no.)	Gross T/A	Net Ears /Plot (no.)	Ears /Plant	Lb/Ear	Net T/A	Culls/Plot (no.)	Cull T/A
Coho	102	27.5	11.8	32.0	1.17	0.54	7.6	0.3	0.03
GSS 1477	102	26.5	10.0	23.3	0.88	0.68	6.8	1.3	0.24
GH 4927	90	26.8	10.9	24.8	0.93	0.63	6.8	1.0	0.17
GH 8267	102	27.3	10.2	26.3	0.96	0.58	6.6	0.3	0.04
GH 6462	102	28.5	10.0	24.5	0.86	0.60	6.4	1.0	0.15
XTH 1377	91	27.0	10.1	21.5	0.80	0.66	6.2	0.3	0.07
GH 6223	102	25.5	8.8	23.0	0.90	0.61	6.2	0.8	0.13
ILL1283	97	28.3	9.0	25.0	0.88	0.56	6.1	0.0	0.00
179A	97	24.3	8.9	21.0	0.86	0.65	5.9	0.8	0.13
ILL1183	97	27.0	8.8	23.8	0.88	0.58	5.9	0.0	0.00
Marvel	91	24.0	8.6	20.8	0.87	0.64	5.8	0.0	0.00
XTH 1182	102	26.5	8.3	21.8	0.82	0.59	5.7	0.8	0.13
170A	90	26.0	8.9	21.5	0.82	0.60	5.6	1.0	0.12
Protégé	97	25.8	8.9	20.8	0.82	0.60	5.4	0.0	0.00
Tamarack	102	24.8	8.3	19.8	0.80	0.61	5.2	1.8	0.35
C2-28	102	25.3	8.9	20.5	0.81	0.55	4.9	2.0	0.19
XTH 1174	91	26.5	8.1	22.0	0.83	0.51	4.9	0.5	0.08
Eliminator	102	25.3	7.9	19.5	0.77	0.53	4.5	0.5	0.12
Conquest	102	28.0	8.3	18.3	0.65	0.54	4.3	1.0	0.15
SS Jubilee	97	26.0	7.6	16.8	0.65	0.54	3.9	0.5	0.07
Jubilee C	97	27.0	7.8	20.8	0.77	0.42	3.8	1.0	0.15
Jubilee	97	27.3	7.3	16.8	0.63	0.52	3.8	0.5	0.09
GSS 2914	102	26.3	6.3	15.3	0.58	0.50	3.3	3.3	0.51
SS Jubilee Plus	97	27.5	6.4	15.8	0.57	0.48	3.3	0.0	0.00
LSD 0.05	0.00	2.91	1.22	3.84	0.15	0.06	1.03	1.52	0.26

[z]Planted June 22 in rows 30" apart, thinned to 9" between plants. Gross T/A is the weight of all harvested unhusked ears. Plants/plot, Net Ears/Plot and Culls/Plot are the average number of plants or ears per 20' of harvested row. All values shown are means of 4 replications arranged in randomized complete blocks. All data except cull no./plot and cull T/A were obtained from typical husked good ears.

Table 3. Yield and ear measurements for selected sugary sweet corn hybrids grown in a trial on the OSU vegetable research farm, Corvallis, 2006.[z]

Entry	Days to Harvest	Plants /Plot (no.)	Gross T/A	Ears /Plot (no.)	Ears /Plant (no.)	Lbs/Ear	Net T/A	Culls /Plot (no.)	Culls T/A	Ear Length (in.)	Ear Dia (in.)	Kernel Depth (mm)	Tender-ness[y]
Coho	97	25.0	15.9	36.3	1.5	0.6	9.9	0.50	0.07	7.7	2.0	1.4	89.3
GH 6223	97	26.5	14.3	29.5	1.1	0.8	9.7	0.00	0.00	8.1	2.1	1.3	97.4
Eliminator	97	26.8	14.4	28.3	1.1	0.7	9.1	0.50	0.14	8.3	2.0	1.1	119.6
Tamarack	97	25.5	14.0	27.0	1.1	0.8	8.9	0.50	0.15	8.4	2.1	1.2	109.5
Jubilee C	95	25.8	14.3	35.3	1.4	0.6	8.8	0.75	0.13	7.6	2.0	1.3	88.3
GH 4927	87	25.5	12.8	30.3	1.2	0.6	8.2	0.25	0.03	8.2	1.9	1.3	122.9
GH 6462	98	25.8	12.6	25.5	1.0	0.7	7.4	0.75	0.15	7.7	2.1	1.3	71.1
GH 8267	98	27.3	10.8	26.8	1.0	0.6	6.9	0.00	0.00	7.9	2.0	1.2	92.1
C2-28	98	24.3	11.0	24.5	1.0	0.6	6.7	0.25	0.04	7.7	2.0	1.2	100.0
Conquest	98	27.0	12.3	25.0	0.9	0.6	6.6	1.00	0.22	8.2	1.9	1.2	100.9
LSD 0.05	0.00	3.24	1.99	4.90	0.24	0.06	1.32	1.20	0.25	0.20	0.06	0.08	11.82

[z]Planted June 23 in rows 30" apart, thinned to 9" between plants. Gross T/A is the weight of all harvested unhusked ears. Plants/plot, Net Ears/Plot and Culls/Plot are the average number of plants or ears per 20' of harvested row. All values shown are means of 4 replications arranged in randomized complete blocks. All data except cull no./plot and cull T/A were obtained from typical husked good ears. For ear length and ear diameter, the value used for each replication was the average of 10 individual ear measurements. [y]Tenderness value is the average of 10 individual primary ear measurements, determined by a spring-operated puncture gauge; lower numbers indicate more tender pericarp.

Table 4. Yield and ear measurements for selected supersweet corn hybrids grown in a root rot trial on the OSU vegetable research farm, Corvallis, 2006.[z]

Entry	Days to Harvest	Plants /Plot (no.)	Gross T/A	Ears /Plot (no.)	Ears /Plant (no.)	Lbs/Ear	Net T/A	Culls /Plot (no.)	Culls T/A	Ear Length (in.)	Ear Diam. (in.)	Kernel Depth (mm)	Tender-ness[y]
GSS 1477	97	25.3	14.4	33.0	1.30	0.73	10.4	0.00	0.00	9.1	2.1	1.4	103.6
179A	95	26.3	12.3	28.3	1.08	0.70	8.6	0.50	0.10	7.8	2.1	1.3	108.0
XTH 1377	88	26.0	11.4	24.5	0.95	0.71	7.6	0.50	0.11	8.4	2.0	1.2	93.6
Protégé	95	24.5	10.9	27.0	1.10	0.65	7.6	0.25	0.02	8.2	2.0	1.3	111.5
XTH 1174	88	25.3	11.0	28.0	1.11	0.59	7.2	0.50	0.09	7.4	2.0	1.1	94.4
170A	88	24.5	10.8	23.5	0.96	0.69	7.1	0.75	0.14	7.7	2.0	1.2	111.4
Marvel	89	23.8	10.1	23.0	0.97	0.70	7.0	0.25	0.04	8.7	2.0	1.2	103.5
ILL1283	95	25.3	10.4	24.8	0.98	0.64	6.9	0.25	0.05	7.9	2.0	1.2	113.4
GSS 2914	99	25.8	10.6	22.8	0.89	0.65	6.4	1.00	0.24	9.3	1.9	1.2	78.1
ILL1183	95	24.0	9.3	22.3	0.93	0.65	6.4	0.00	0.00	8.1	2.0	1.2	119.5
SS Jubilee	95	25.8	9.4	25.3	0.98	0.55	6.0	0.75	0.12	7.7	1.9	1.1	106.0
SS Jubilee Plus	95	27.0	9.4	25.0	0.92	0.55	6.0	0.25	0.03	7.8	1.9	1.2	103.5
XTH 1182	89	26.3	8.0	20.8	0.80	0.56	5.1	0.00	0.00	7.8	1.9	1.1	113.6
LSD 0.05	0.00	2.95	1.87	4.72	0.16	0.05	1.34	0.94	0.20	0.17	0.05	0.08	9.34

[z]Planted June 22 in rows 30" apart, thinned to 9" between plants. Gross T/A is the weight of all harvested unhusked ears. Plants/plot, Net Ears/Plot and Culls/Plot are the average number of plants or ears per 20' of harvested row. All values shown are means of 4 replications arranged in randomized complete blocks. All data except cull no./plot and cull T/A were obtained from typical husked good ears. For ear length and ear diameter, the value used for each replication was the average of 10 individual ear measurements. [y]Tenderness value is the average of 10 individual primary ear measurements, determined by a spring-operated puncture gauge; lower numbers indicate more tender pericarp.

Table 5. Ear quality evaluations for selected sugary sweet corn hybrids grown in a trial on the OSU vegetable research farm, Corvallis, 2006.[z]

						Uniformity						
Entry	Harvest Date	Shape	Refine-ment	Row Straight-ness	Tip Fill	Ear	Maturity	Kernel	Flavor	Overall Score	Row (no.)	Notes
C2-28	29-Sep	3.5	3.5	3	3.5	3	2.5	3	3	3	20	Variation in size & shape; some curved ears;
Coho	28-Sep	3.5	4	3	4.5	4	3.5	3.5	3.5	3.5	18-22	Tend to bulge in the middle; very good yield--many second ears
Conquest	29-Sep	4.5	4.5	3	2.5	3.5	3	3	3.5	3	20	Some plants without a useable ear; long narrow ears with good shape
Eliminator	28-Sep	3	2.5	3	2.5	2.5	3	3	3	2.5	16-20	Highly variable shape and size; pale color; oval ears
GH 4927	18-Sep	3	3	3	4.5	3	3	3	2.5	3	18	Pleasant flavor but not at all sweet; many curved ears; uneven kernels make ears look rough
GH 6223	28-Sep	4	3.5	3	3.5	4.5	4.5	3.4	3	3.5	18	Excellent yield--many second ears; pale color; good corn flavor but not sweet
GH 6462	29-Sep	3	4.5	4	3.5	2.5	2.5	4	3.5	3	18-20	Some ears bulge slightly in middle; best ears are very nice but highly variable--RR effect??
GH 8267	29-Sep	4.5	4	3	3.5	3	3	3	3.5	3.5	18	Low yield--less than 1 good ear per plant; pale color; small ears; slight tendency for curved ears
Jubilee C	26-Sep	4.5	4	4.5	3.5	4	4	4	3.5	4	16	Typical Jubilee--excellent yield; everything from here on contami-nated with sh2 pollen--from another field??
Tamarack	28-Sep	2.5	3	2.5	3	2.5	3	2.5	2.5	2.5	18	Very tapered shape; not sweet; oval cobs

[z]Planted June 23. Scores based on a 1-5 scale, with 5 = best.

Table 6. Ear quality evaluations for selected supersweet corn hybrids grown in a trial on the OSU vegetable research farm, Corvallis, 2006.[z]

						Uniformity						
Entry	Harvest Date	Shape	Refine-ment	Row Straight-ness	Tip Fill	Ear	Maturi-ty	Kernel	Flavor	Overall Score	Row (no.)	Notes
1183	25-Sep	2.5	3	3	3.5	2.5	3	2.5	3	3	18	Curved ears; best ears look good but too many plants with poor or no ears
1283	25-Sep	2.5	3	3	3	2.5	2.5	3	3.5	3	18	Curved ears; best ears are nice looking but too many small ears with poor tip fill
170A	18-Sep	2.5	2	2.5	4	3	3	2.5	3.5	2.5	16	Most ears curved; coarse kernels
179A	25-Sep	3.5	2	3	3.5	3.5	3.5	2.5	3.5	3	16	Some curved ears and some ears bulge in the middle; oval ears; coarse kernels; very sweet
GSS 1477	27-Sep	4	3.5	3.5	2.5	4.5	4.5	3.5	4	4.5	16-20	Ears slightly curved; excellent yield--many very useable second ears--some indistin-guishable from first ears
GSS 2914	29-Sep	3.5	2.5	4	1.5	2	2.5	3	4.5	2.5	18	Some curved ears; gaps, esp. at the bot-tom of cob; highly variable--some plants with no good ears (RR effect??); terrible tip fill
Marvel	19-Sep	3	2.5	3.5	2.5	3	3	3	3	3	16	Coarse kernels; very large ears
Protégé	25-Sep	3.5	3	3	3	3.5	3.5	3	3.5	3.5	18	
SS Jubilee	25-Sep	4	4	4	2.5	2.5	3	4	4.5	3	18	Same notes as Jubilee SS Plus
SS Jubilee Plus	25-Sep	4.5	4	4	2.5	3	3	4	4.5	3	18	Best ears look typical but many are small with very poor tip fill, or too young--some plants with no ears--RR effect??
XTH 1174	18-Sep	4	3.5	3.5	5	4	4	3.5	4	3.5	18	Attractive, very uniform, small ears; very sweet; yield??
XTH 1182	19-Sep	2.5	4	3	2.5	3	2	3	3	2.5	18	Very poor yield--many plants with no ear; all ears curved, some extreme; oval ears
XTH 1377	18-Sep	2	3.5	3	3	2.5	2.5	2	3.5	2	14-20	Oval ears, some curved; kernels quite va-riable in color with some ears with white kernels; kernels also variable in size with a few ears very jumbled, almost shoepeg; very tender & sweet but no corn flavor

[z]Planted June 23. Scores based on a 1-5 scale, with 5 = best.

Table 7. Overall Root disease ratings of sweet corn hybrids grown at the OSU Botany and Vegetable Research Farms, Corvallis, 2006[z].

		Sign. diff from:[y]			Sign. diff from:			Sign. diff from:			Sign. diff from:			Sign. diff from:			Sign. diff from:	
Entry	Primary root rot (%)	Jub.	Coho	Mesocotyl root rot (%)	Jub.	Coho	Adventitious root rot (%)	Jub.	Coho	Brown Node[x]	Jub.	Coho	Crown rot[w]	Jub.	Coho	Root worm[v]	Jub.	Coho
179A	86.9			82.8		*	23.7	*	*	0.66	*		0.34	*		1.02	*	
Protégé	75.3	*		59.7	*		27.6	*	*	0.12	*		0.16	*		1.10		*
Conquest	91.8		*	80.2		*	29.3	*		0.84	*	*	0.39	*		1.05	*	
GH 6223	81.3	*		43.8	*	*	29.3	*		1.13	*	*	0.35	*		1.09		
C2-28	73.6	*		71.6			29.5	*		0.38	*		0.29	*		1.05	*	
XTH 1174	76.4	*		59.5	*		29.9	*		1.41	*	*	0.70			0.98		
Eliminator	69.2	*		53.6	*		30.6	*		0.89	*	*	0.37	*		0.97	*	
170A	81.5			79.8		*	31.6	*		0.70	*		0.47	*		0.98	*	
XTH 1182	81.5			72.8			33.1	*		0.75	*		0.43	*		1.10		
GH 6462	101.6		*	91.0		*	33.3	*		1.71	*	*	0.85		*	1.05	*	
1183	82.6			63.1	*		33.7	*		1.50	*	*	0.53	*		1.06		
Coho	75.4	*	x	63.9	*	x	35.6	*	x	0.38	*	x	0.37	*	x	0.97	*	x
XTH 1377	87.1		*	79.7		*	37.0	*		1.45	*	*	1.01		*	1.23		*
GH 4927	86.9		*	65.4	*		37.4	*		1.50	*	*	1.02		*	1.05	*	
GH 8267	92.9		*	88.3		*	38.1	*		1.96		*	0.72		*	1.22		*
1283	83.3			58.9	*		39.6	*		1.24	*	*	0.61			1.07		
SS Jubilee	88.1		*	77.9		*	42.2			1.33	*	*	0.74			0.98	*	
GSS 2914	82.7			72.8			43.5		*	0.91	*	*	0.57			0.93	*	
Tamarack	77.5	*		55.9	*		43.7		*	1.09	*	*	0.52	*		1.01		
Marvel	83.1			79.4		*	44.7		*	0.08	*		0.24	*		1.10		*
Jubilee C	91.8		*	83.9		*	46.0		*	1.84		*	1.00		*	1.09		*
Jubilee	92.8	x	*	80.0	x	*	47.6	x	*	2.21	x	*	0.91	x	*	1.22	x	*
SS Jubilee Plus	83.3			77.6		*	49.9		*	1.41	*	*	0.70			0.98		
GSS 1477	84.6			77.3			50.1		*	0.70	*		0.34	*		1.27		*

[z]Combined analysis from three locations.
[y]Least square means calculated because of missing values. * indicates signficantly different from the check cultivar at 95% probability level.
[x]Number of nodes above the soil line with brown discoloration.
[w]Scale of 0-1.5 0=no crown discoloration, 0.5 beginning of discoloration, 1=crown rot present, 1.5=crown rot with black discoloration.
[v]Scale of 1-3, 1=no evidence of feeding, 2=less than 75% adventitious roots with feeding, 3=more than 75% roots with feeding.

Table 8. Root disease ratings of sweet corn hybrids grown at the OSU Botany Farm, Corvallis, 2006.

			Sign. diff from:[z]			Sign. diff from:			Sign. diff from:			Sign. diff from:		
Entry	Primary root rot (%)	Meso-cotyl root rot (%)	Jub.	Coho	Adventi-tious root rot (%)	Jub.	Coho	Brown Node[y]	Jub.	Coho	Crown rot[x]	Jub.	Coho	Root worm[w]
Protégé	91.6	63.6	*	*	31.3	*	*	0.08	*	*	0.17	*		1.00
179A	98.4	99.6			32.1	*	*	1.17	*		0.58			1.00
GH 6223	91.3	55.0	*	*	34.2	*	*	2.25		*	0.63			1.00
C2-28	95.5	81.4			34.6	*	*	0.83	*		0.42			1.00
Conquest	95.9	91.3			36.3	*	*	1.42	*	*	0.58			1.00
Eliminator	88.6	70.8			36.3	*	*	1.33	*	*	0.58			1.00
170A	92.9	97.1			38.3	*	*	1.33	*	*	0.83			1.00
GH 6462	90.8	97.1			40.4	*	*	1.92	*	*	0.88			1.00
XTH 1377	97.2	87.5			41.7	*		2.08	*	*	1.00		*	1.08
XTH 1182	86.3	88.8			41.7	*		0.75	*		0.46			1.00
ILL1183	88.6	79.2			42.5	*		1.67	*	*	0.71			1.00
GH 4927	85.1	77.1			44.1	*		2.07	*	*	0.99		*	1.00
XTH 1174	82.0	79.6			44.7	*	*	1.83	*	*	0.92			1.00
SS Jubilee	98.1	93.8			46.7	*		2.00		*	1.00			1.00
Coho	91.5	85.8		x	47.9	*	x	0.75	*	x	0.50		x	1.00
GH 8267	100.0	91.7			50.0	*		2.08	*	*	0.88			1.17
Marvel	89.0	80.9			52.5	*		0.42	*		0.37	*		1.00
ILL1283	93.2	79.1			56.7		*	1.83	*	*	0.87			1.00
GSS 2914	91.3	74.2			62.5		*	1.67	*	*	0.75			1.00
Jubilee	95.6	86.9	x		62.5	x	*	2.67	x	*	1.04	x		1.00
Tamarack	93.1	78.7			64.6		*	1.83	*	*	0.92			1.00
SS Jubilee Plus	89.5	87.1			65.4		*	2.50	*	*	0.96			1.00
Jubilee C	99.1	97.9			66.7		*	2.25	*	*	1.21		*	1.00
GSS 1477	92.7	89.6			70.0		*	1.42	*	*	0.54			1.00
	ns													ns

[z]Least square means calculated because of missing values. * significantly different from the check cultivar at 95% probability level.
[y]Number of nodes above the soil line with brown discoloration.
[x]Scale of 0-1.5 0=no crown discoloration, 0.5 beginning of discoloration, 1=crown rot present, 1.5=crown rot with black discoloration.
[w]Scale of 1-3, 1=no evidence of feeding, 2=less than 75% adventitious roots with feeding, 3=more than 75% roots with feeding.
ns indicates that entries were not statistically significantly different from one another for the trait in question.

Table 9. Root disease ratings of sugary sweet corn hybrids grown at the OSU Vegetable Research Farm, Corvallis, 2006.

		Sign. diff from:[z]			Sign. diff from:[z]			Sign. diff from:			Sign. diff from:			Sign. diff from:			Sign. diff from:	
Entry	Primary root rot (%)	Jub.	Coho	Meso-cotyl root rot (%)	Jub.	Coho	Adventi-tious root rot (%)	Jub.	Coho	Brown Node[y]	Jub.	Coho	Crown rot[x]	Jub.	Coho	Root worm[w]	Jub.	Coho
Conquest	73.8		*	58.3		*	10.4	*		0.50	*		0.25	*		1.00	*	
Tamarack	49.6	*		23.3	*		10.8	*		0.58	*		0.17	*		0.92	*	
Coho	47.9	*	x	31.3	*	x	11.3	*	x	0.25	*	x	0.29	*	x	0.83	*	x
C2-28	38.0	*		50.8		*	12.5	*		0.17	*		0.21	*		1.00	*	
GH 6223	57.9			21.7	*		12.5	*		0.25	*		0.13	*		1.08		
Jubilee C	71.6	x	*	59.2	x	*	13.3	x		1.67	x	*	0.83	x	*	1.08	x	*
Eliminator	32.9	*		23.7	*		13.6	*		0.67	*		0.20	*		0.83	*	
GH 6462	94.5		*	74.2		*	14.2	*		1.75		*	0.88		*	1.00		
GH 8267	73.5		*	75.2		*	14.2	*		2.08		*	0.63		*	1.17		*
GH 4927	78.3		*	43.4			18.3		*	1.17	*	*	0.33	*		1.00	*	

[z]Least square means calculated because of missing values. * indicates significantly different from the check cultivar at 95% probability level.
[y]Number of nodes above the soil line with brown discoloration.
[x]Scale of 0-1.5 0=no crown discoloration, 0.5 beginning of discoloration, 1=crown rot present, 1.5=crown rot with black discoloration.
[w]Scale of 1-3, 1=no evidence of feeding, 2=less than 75% adventitious roots with feeding, 3=more than 75% roots with feeding.

Table 10. Root disease ratings of supersweet corn hybrids grown at the OSU Vegetable Research Farm, Corvallis, 2006.

Entry	Primary root rot (%)	Sign. diff from:[z] SS Jub.	Meso-cotyl root rot (%)	Sign. diff from: SS Jub.	Adventi-tious root rot (%)	Sign. diff from: SS Jub.	Brown Node[y]	Sign. diff from: SS Jub.	Crown rot[x]	Sign. diff from: SS Jub.	Root worm[w]	Sign. diff from: SS Jub.
XTH 1174	94.2		62.5	*	37.9	*	1.3		0.67		1.0	
179A	98.3		89.6		37.9	*	0.4	*	0.29	*	1.1	
ILL1283	97.1		62.2	*	44.3	*	0.9		0.52		1.2	
Protégé	83.7	*	77.1		46.7	*	0.4	*	0.33	*	1.3	
GSS 2914	95.7		95.1		47.1	*	0.4	*	0.58		0.9	
XTH 1182	98.8		80.1		47.1	*	1.0		0.58		1.3	
170A	91.1	*	84.7		47.5	*	0.3	*	0.29	*	1.0	
ILL1183	98.3		69.2		47.5	*	1.6	*	0.54		1.2	
GSS 1477	98.2		88.1		52.9		0.3	*	0.33	*	1.6	*
XTH 1377	99.1		95.3		55.0		1.1		0.46		1.4	*
SS Jubilee Plus	99.7	x	91.3	x	57.1	x	0.6	x	0.63	x	1.0	x
Marvel	99.8		100.0		59.6		0.0	*	0.29	*	1.3	
SS Jubilee	99.7		84.9		60.4		0.9		0.67		1.0	

[z]Least square means calculated because of missing values. * indicates significantly different from the check cultivar at 95% probability level.
[y]Number of nodes above the soil line with brown discoloration.
[x]Scale of 0-1.5 0=no crown discoloration, 0.5 beginning of discoloration, 1=crown rot present, 1.5=crown rot with black discoloration.
[w]Scale of 1-3, 1=no evidence of feeding, 2=less than 75% adventitious roots with feeding, 3=more than 75% roots with feeding.

Table 11. Correlation among root disease and yield traits for sweet corn hybrids grown at three locations in Oregon in 2006.

	Mesocotyl rating		Adventi-tious root rot		Brown Node		Crow n rot		Root worm		Gross T/A		Net T/A		Ear Length		Ear Diam		Kernel Depth	
Primary root rot	0.82	***	0.71	***	0.30	*	0.38	***	0.37	**	-0.59	***	-0.48	***	0.12	ns	-0.24	ns	-0.09	ns
Mesocotyl rat-ing	1.00		0.71	***	0.28	+	0.42	**	0.30	*	-0.60	***	-0.52	***	0.20	ns	-0.25	ns	-0.12	ns
Adventitious root rot			1.00		0.29	+	0.37	*	0.25	+	-0.65	***	-0.52	***	0.25	ns	-0.25	ns	-0.21	ns
Brown Node					1.00		0.79	***	-0.11		-0.48	***	-0.53	***	-0.35	ns	-0.24	ns	-0.20	ns
Crown rot							1.00		-0.09		-0.40	**	-0.45	**	-0.30	ns	-0.42	ns	-0.16	ns
Root worm									1.00		0.09		0.24	ns	0.36	+	0.10	ns	0.20	ns
Gross T/A											1.00		0.95	***	0.10	ns	0.60	**	0.62	**
Net T/A													1.00		0.20	ns	0.73	***	0.71	***
Ear Length															1.00		0.09	ns	0.04	ns
Ear Diam																	1.00		0.57	ns

Significantly different at + = 90%; * = 95%; ** = 99% and *** = >99.9% probability levels. ns = not significant.

Table 12. Correlation among root disease and yield traits for sweet corn hybrids grown at the OSU Botany Farm in Oregon in 2006.

	Mesocotyl rating		Adventitious root rot		Brown Node		Crown rot		Root worm		Gross T/A		Net T/A	
Primary root rot	0.45	*	0.09	ns	0.18	ns	0.08	ns	0.42	*	0.01	ns	-0.12	ns
Mesocotyl rating	1.00		0.19	ns	0.14	ns	0.22	ns	0.17	ns	0.09	ns	-0.03	ns
Adventitious root rot			1.00		0.43	*	0.24	ns	-0.01	ns	-0.29	ns	-0.27	ns
Brown Node					1.00		0.72	***	0.22	ns	-0.24	ns	-0.29	ns
Crown rot							1.00		0.27	ns	0.12	ns	-0.02	ns
Root worm									1.00		0.31	ns	0.27	ns
Gross T/A											1.00		0.93	***

Significantly different at + = 90%; * = 95%; ** = 99% and *** = >99.9% probability levels. ns = not significant.

Table 13. Correlation among root disease and yield traits for sugary sweet corn hybrids grown at the OSU Vegetable Research Farm in Oregon in 2006.

	Mesocotyl rating		Adventi-tious root rot		Brown Node		Crown rot		Root worm		Gross T/A		Net T/A		Ear Length		Ear Diam		Kernel Depth	
Primary root rot	0.71	*	0.39	ns	0.71	*	0.71	*	0.56	+	-0.31	ns	-0.38	ns	-0.15	ns	-0.23	ns	0.28	ns
Mesocotyl rating	1.00		0.23	ns	0.74	*	0.79	**	0.60	+	-0.68	*	-0.78	**	-0.51	ns	-0.45	ns	-0.05	ns
Adventitious root rot			1.00		0.52	ns	0.31	ns	0.25	ns	-0.25	ns	-0.08	ns	-0.02	ns	-0.23	ns	0.12	ns
Brown Node					1.00		0.87	***	0.56	+	-0.35	ns	-0.33	ns	-0.25	ns	-0.24	ns	0.00	ns
Crown rot							1.00		0.45	ns	-0.19	ns	-0.28	ns	-0.59	+	-0.12	ns	0.30	ns
Root worm									1.00		-0.59	+	-0.44	ns	-0.22	ns	-0.19	ns	0.02	ns
Gross T/A											1.00		0.92	***	0.07	ns	0.41	ns	0.54	ns
Net T/A													1.00		0.13	ns	0.55	ns	0.52	ns
Ear Length															1.00		0.02	ns	-0.55	+
Ear Diam																	1.00		0.31	ns

Significantly different at + = 90%; * = 95%; ** = 99% and *** = >99.9% probability levels. ns = not significant.

Table 14. Correlation among root disease and yield traits for supersweet corn hybrids grown at the OSU Vegetable Research Farm in Oregon in 2006.

	Mesocotyl rating		Adventi-tious root rot		Brown Node		Crown rot		Root worm		Gross T/A		Net T/A		Ear Length		Ear Diam		Kernel Depth	
Primary root rot	0.30	ns	0.39	ns	0.19	ns	0.31	ns	0.10	ns	-0.15	ns	-0.13	ns	0.09	ns	-0.11	ns	-0.34	ns
Mesocotyl rating	1.00		0.58	ns	-0.63	ns	-0.36	ns	0.13	ns	0.16	ns	0.14	ns	0.52	+	0.10	ns	0.20	ns
Adventitious root rot			1.00		-0.23	ns	0.04	ns	0.23	ns	-0.19	ns	-0.15	ns	0.30	ns	-0.29	ns	-0.14	ns
Brown Node					1.00		0.67	*	-0.10	ns	-0.41	ns	-0.40	ns	-0.45	ns	-0.35	ns	-0.57	*
Crown rot							1.00		-0.44	ns	-0.56	ns	-0.63	*	-0.30	ns	-0.79	***	-0.78	**
Root worm									1.00		0.47	ns	0.59	*	0.43	ns	0.37	ns	0.51	+
Gross T/A											1.00		0.98	***	0.41	ns	0.79	***	0.76	***
Net T/A													1.00		0.39	ns	0.83	***	0.84	***
Ear Length															1.00		0.17	ns	0.36	ns
Ear Diam																	1.00		0.73	**

Significantly different at + = 90%; * = 95%; ** = 99% and *** = >99.9% probability levels. ns = not significant.

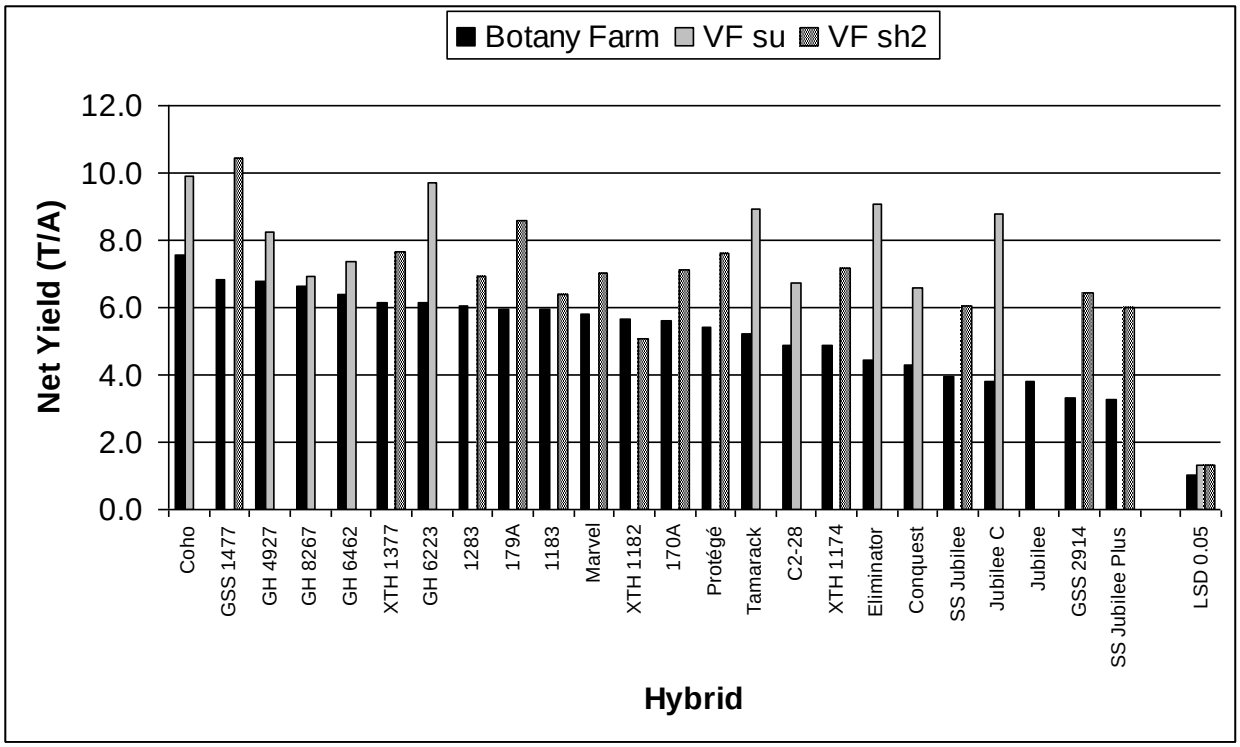

Figure 1. Net yield for sweet corn hybrids grown at three locations at the OSU Botany and Vegetable Research Farms, Corvallis in 2006. Botany = Botany farm where both supersweet and sugary hybrids were grown; VF su = Vegetable Farm sugary hybrid trial; and VF sh2 = Vegetable Farm supersweet trial.

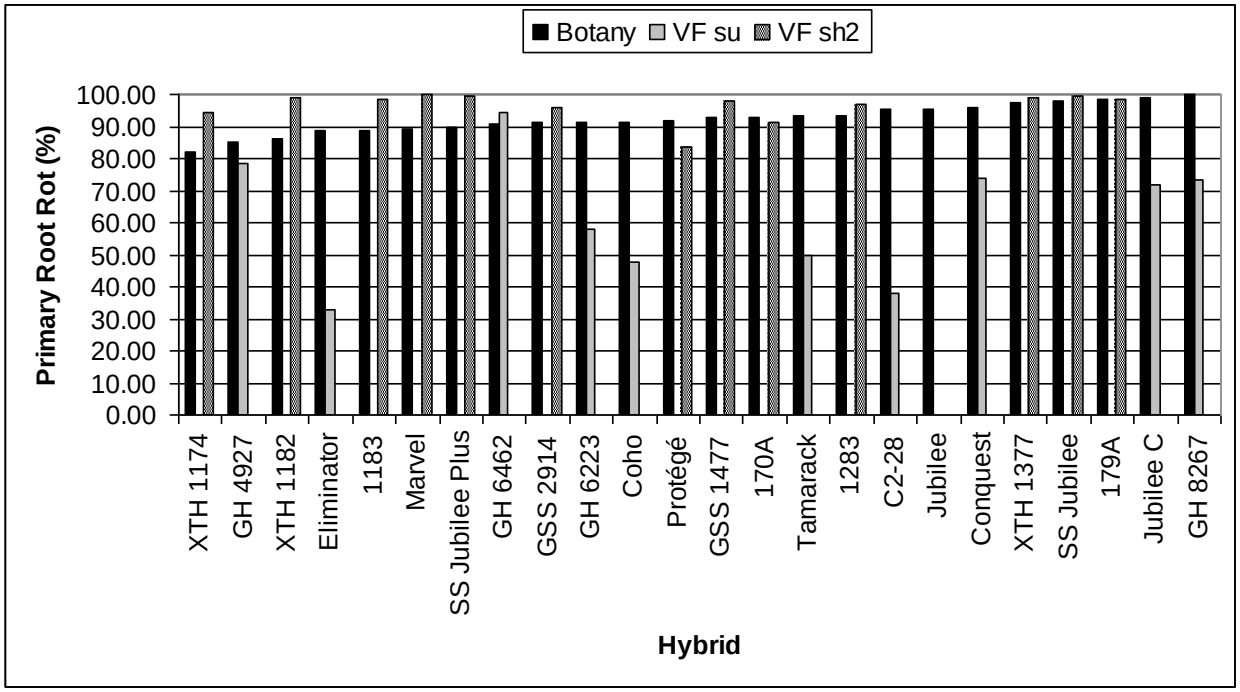

Figure 2. Root rating of the primary roots of sweet corn hybrids grown at three locations on the OSU Botany and Vegetable Research Farms, Corvallis in 2006. Botany = Botany farm where both supersweet and sugary hybrids were grown; VF su = Vegetable Farm sugary hybrid trial; and VF sh2 = Vegetable Farm supersweet trial.

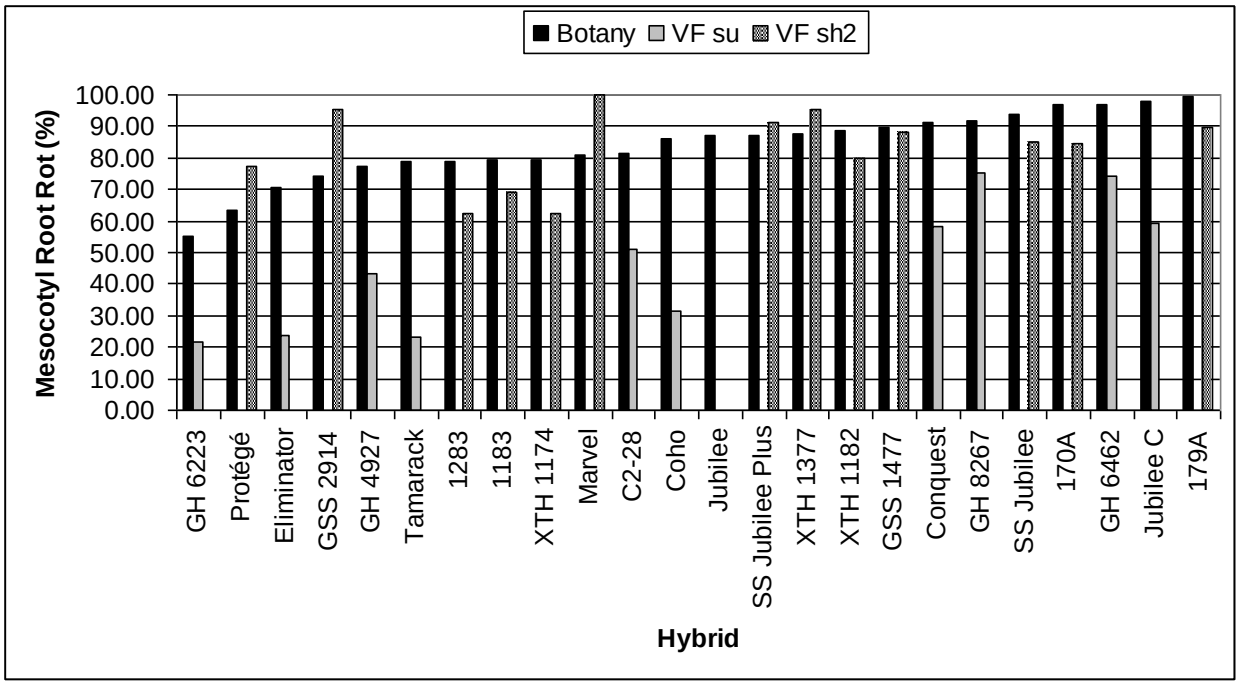

Figure 3. Mesocotyl root rot of sweet corn hybrids grown at three locations on the OSU Botany and Vegetable Research Farms, Corvallis in 2006. Botany = Botany farm where both supersweet and sugary hybrids were grown; VF su = Vegetable Farm sugary hybrid trial; and VF sh2 = Vegetable Farm supersweet trial.

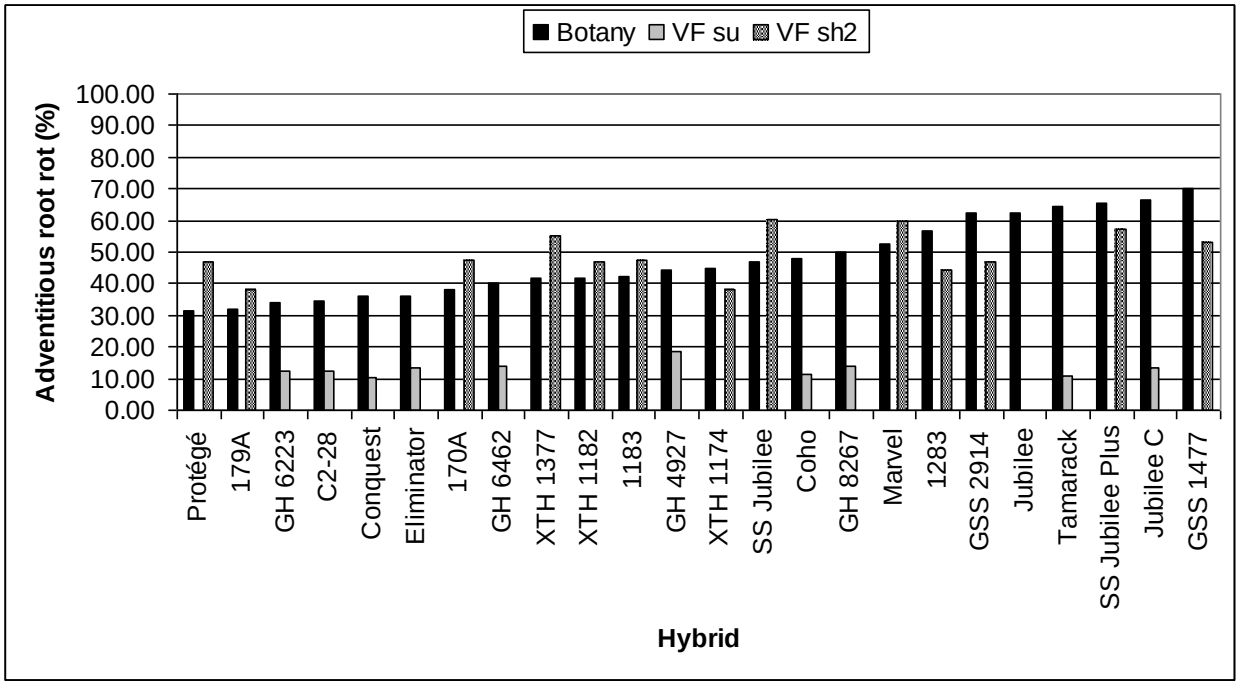

Figure 4. Adventitious root rot of sweet corn hybrids grown at three locations on the OSU Botany and Vegetable Research Farms, Corvallis in 2006. Botany = Botany farm where both supersweet and sugary hybrids were grown; VF su = Vegetable Farm sugary hybrid trial; and VF sh2 = Vegetable Farm supersweet trial.

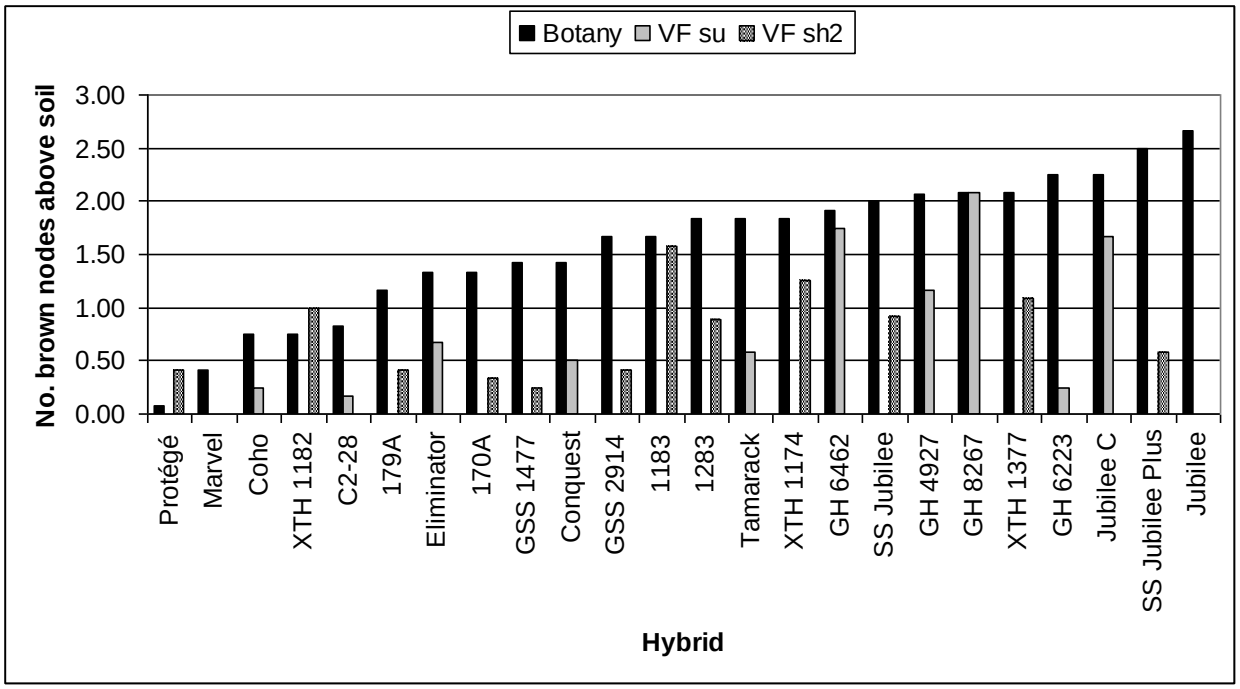

Figure 5. Number of nodes above the soil line with internal browning of sweet corn hybrids grown at three locations on the OSU Botany and Vegetable Research Farms, Corvallis in 2006. Botany = Botany farm where both supersweet and sugary hybrids were grown; VF su = Vegetable Farm sugary hybrid trial; and VF sh2 = Vegetable Farm supersweet trial.

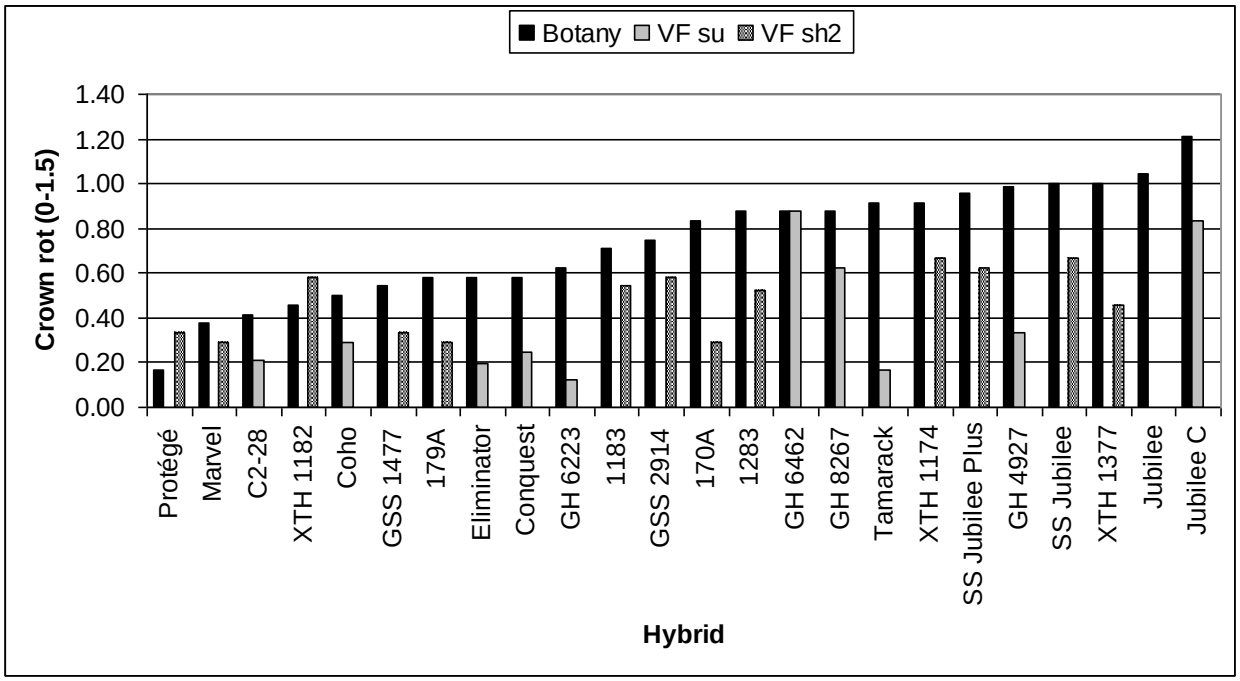

Figure 6. Crown rot rating of sweet corn hybrids grown at three locations on the OSU Botany and Vegetable Research Farms, Corvallis in 2006. Botany = Botany farm where both supersweet and sugary hybrids were grown; VF su = Vegetable Farm sugary hybrid trial; and VF sh2 = Vegetable Farm supersweet trial. See footnote table 7 for explanation of scale.