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Anthracnose Resistance
of
Corn Inbreds

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DISCLAIMER

Trade names are given solely to provide specific experimental information and not as an endorsement to the exclusion of other products that may also be suitable.

ANTHRACNOSE RESISTANCE OF CORN INBREDS

D. L. Thompson and K. J. Leonard ^{1/}

ABSTRACT

Over 400 genotypes of corn (Zea mays L.) were evaluated in controlled environment rooms for resistance to anthracnose caused by Colletotrichum graminicola (Ces.) Wils. Corn seedlings two weeks old were inoculated with one local isolate of the fungus and evaluated one week later by measuring a typical lesion on the fourth leaf of each plant. Length of individual lesions ranged from 1 to 10 mm. Mean lesion length for the genotypes ranged from 1.2 mm (shortest; most resistant) to 8.0 mm (longest; most susceptible). Most genotypes were inbreds. Those with lesions averaging 2.5 mm or less were considered resistant and there were 17 different inbreds in this category. These data should serve as an initial appraisal of genotype resistance, as a basis for choosing genotypes for further evaluation, and as a guide for considering genotypes having potential in breeding for resistance.

INTRODUCTION

The disease anthracnose caused by Colletotrichum graminicola (Ces.) Wils. has been present for some time in North Carolina, but it has not been particularly serious on corn (Zea mays L.). A survey (5) involving broken corn stalks collected from 40 counties in North Carolina in 1968 showed that the fungus was present in 18% of the samples from the Coastal Plain and 2% from the Piedmont. In 1972 anthracnose caused premature death of top leaves over a wide area in eastern North Carolina. Stalk infections of C. graminicola caused lodging in some fields in 1972 and 1973 (4).

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Anthracnose on corn occurs over a wide area in the United States and in other countries as well. Anthracnose on corn was found first in South Carolina in 1855 (14) and has been reported in Arkansas (2), Indiana (11), Kentucky (12), Maryland (6), Ohio (13), and in India, Southeast Asia, South Africa and Europe (1, 3, 9, 10, 12). Isolates from the following states readily attacked corn seedlings and further demonstrated the wide occurrence of the disease: Delaware, Georgia, Kansas, Kentucky, Mississippi, and North Carolina (12). In many instances the disease is of little economic importance, but it has caused severe damage in localized areas (2, 11, 13). Isolates from different areas show differences in pathogenicity (8, 12).

Genetic variability for resistance to anthracnose has been reported by Poneleit, Politis, and Wheeler (8) and Nicholson and Warren (7). Most strains were susceptible, but some were resistant. Since the disease is widespread and may increase in severity, evaluation of additional corn strains will help provide resistance information necessary for coping with the problem if it becomes more severe.

The purpose of this research was to evaluate the maximum number of corn strains within the time and resources available and to identify those having potential value in breeding for anthracnose resistance.

MATERIALS AND METHODS

Plants were grown in 4 1/2-inch plastic pots on movable trucks with 16 pots per truck and two plants per pot. Four pots were planted with one genotype to give a total of eight plants; however, fewer plants were realized for some of the genotypes. The growth substrate was a mixture

of Jiffy-Mix (a commercial peat-vermiculite mixture) and No. 16 gravel in a 1:2 ratio by volume. The substrate volume per pot was 0.6 liter. Pots were watered as needed with the standard Phytotron nutrient solution.

All plants were grown in the Phytotron (Southeastern Plant Environment Laboratory, Raleigh, N. C.). Plants were grown in the Phytotron greenhouse for one week after planting and then transferred to the Phytotron controlled environment rooms, which were 2.4 x 3.7 x 2.1 m high. The greenhouse was maintained at day/night temperatures of 30/26 C with seasonal light during the day and a 3-hr dark interruption period from incandescent lamps at night (11 p.m.-2 a.m.). The greenhouse was used for the first week of growth because space was available; controlled environment rooms would have served as well. Successive plantings were made, generally at weekly intervals, during the months of January, February and March, 1974.

The controlled environment rooms were equipped with a combination of cool-white fluorescent and incandescent lamps in an approximate ratio of 100:300 by wattage. There were 84 T-12, 215 w, 1500 ma fluorescent lamps with 225° reflectors (FR96T12/CW/1500) and 48 incandescent lamps of 130 v/100 w each. All lamps were on 9 hr each day (8 a.m.-5 p.m.) and incandescent lamps only 3 hr each night (11 p.m.-2 a.m.) for the dark interruption period. Day/night temperatures were 30/26 C. Illumination was maintained at 400-450 hlx 1 m below the lamps during the day (9 hr) and at 30-40 hlx during the dark interruption period (3 hr). The distance between the lamps and the top of the growth substrate in the pots was approximately 1.3 m. The plants were grown in these rooms for one week prior to inoculation and for one week after inoculation.

The corn plants were inoculated two weeks after planting in about the 5-leaf stage with an aqueous suspension of conidia of C. graminicola. The inoculum consisted of 250,000 conidia/ml and was sprayed on with a hand sprayer attached to an air pump. The inoculum was prepared by flooding 2 or 3-weeks-old cultures with sterile water and scraping the conidia from the surface. The resulting suspension was filtered through four layers of cheesecloth to remove mycelial fragments. The isolate of C. graminicola used for all inoculations was obtained from a diseased corn plant collected near Wallace, N. C. in 1973.

After inoculation plants were placed in a dark moist-chamber at 28 C for 16 hr and then transferred back to the controlled environment rooms with temperatures and lighting as previously described. The moist-chamber was a Phytotron controlled environment room which had been modified by the installation of an overhead mister system for humidity control. Relative humidity was maintained at 100% by time clock activation of the mister system for one minute every 20 minutes.

Genotypes were evaluated one week after inoculation by measuring the length in mm of one typical lesion on the fourth leaf of each plant. Some genotypes were evaluated several times in separate runs. A run consisted of those genotypes planted, inoculated, and evaluated as a group. Generally, a new run or group was initiated each week. Runs were coded 1 to 10 and each required 3 weeks for completion from planting to evaluation. Two genotypes were included as check entries. The hybrid Pioneer Brand 3369A (P3369A) was included as the susceptible check and the inbred NC2A12 as the resistant

check. No comparisons have been made between seedling reactions reported herein and field performance.

EXPERIMENTAL RESULTS

Resistant inbreds

Corn inbreds with a lesion length of 2.5 mm or less were considered resistant. Seventeen different inbreds of about 400 evaluated equaled this definition of resistance and are listed in Table 1. These inbreds merit consideration in breeding programs as sources of resistance to anthracnose of corn. The inbred B37 had a lesion length of 7.2 mm and is included in Table 1 as a susceptible check comparison. Lesion lengths for the experiment, i.e., all plants of all genotypes, ranged from 1 to 10 mm.

Complete listing

A complete listing of all genotypes evaluated for anthracnose is presented in Appendix Table 1A. Genotypes in this table are arranged alphabetically for ease of reference. In some instances state symbols were assigned to a genotype because seed was obtained from that state. In some cases a given genotype was obtained from different seed sources and each was handled as a separate entry and each source is listed separately; e.g., A619 was evaluated from two sources and both are listed. Data for a few genotypes were not considered adequate for reporting; however, the genotype is retained in the listing for completeness.

Eleven entries were evaluated three times and 66 entries were evaluated two times in separate runs. In these cases lesion lengths as averaged for the two or three evaluations are presented in the listing rather than the separate individual evaluations. Correlations between evaluations are shown in Table 2 and were as follows: .69^{**}, .48, and .81^{**}.

TABLE 1: CORN INBREDS RESISTANT TO ANTHRACNOSE

ENT	PEDIGREE	SOURCE	L.NO.	PL.HT.	LESION	S.D.	PLANTS	RUN
189	VA.59	2898(73)	5	15	1.5	1.27	13	40
98	*NYX65	55(71)	5	19	1.6	1.36	16	20
204	33-16	39(71)	5	16	1.6	0.63	16	40
265	*MO.Q67-9	ACC 74054	6	15	1.6	0.74	14	50
	10#*NC2A12	3004(73)	5	19	1.8	0.93	65	2345678890
127	T101	858(72)	6	20	1.8	0.83	12	20
328	T8	ACC 74117	7	18	1.8	0.75	6	6
106	PA887P	27(71)	4	16	1.9	0.99	15	270
125	T8	37(70)	6	16	2.0	1.28	12	20
288	WF9	ACC 74077	5	15	2.0	0.63	6	5
330	*VA.30	ACC 74119	5	17	2.0	0.82	4	6
332	*VA.37	ACC 74121	6	21	2.0	0.82	7	6
37	CI.90C	1282&3(72)	5	18	2.1	1.04	23	150
135	T238	862(72)	5	16	2.1	1.06	15	30
198	WF9	33(70)	6	20	2.1	1.06	16	40
280	T101	ACC 74069	5	16	2.2	1.23	10	50
383	SC55	ACC 74172	6	21	2.3	1.21	6	7
459	ND203	ACC 74209	5	19	2.3	1.38	7	10
205	*NC7HB10	2171(70)	6	13	2.4	1.16	14	40
374	HPR-1	ACC 74163	5	14	2.5	1.05	6	7
1	+B37	35(70)	5	17	7.2	0.71	8	9
5	+P3369A (HYBRID)	2-2-(73)	5	23	6.7	1.34	78	1234567890

* UNRELEASED LINE

SEE TABLE 1A FOR RELATED NC2A12 LINES; LESION LENGTHS WERE AS FOLLOWS 1.2, 1.4, 1.6, 1.6, 1.7, 1.8, 1.8, 1.8, 1.9 2.0, 2.1, 2.3, 3.8, AND 3.9 MM.

‡ SUSCEPTIBLE

ENT: EXPERIMENT ENTRY NUMBER OF GENOTYPE.

PEDIGREE: NAME OF GENOTYPE.

SOURCE: FILE DESIGNATION OF SEED.

L.NO.: NUMBER OF LEAVES ON INOCULATION DATE.

PL.HT.: PLANT HEIGHT IN CENTIMETERS ON INOCULATION DATE; HEIGHT MEASURED FROM SOIL TO INTERSECTION OF TOP TWO LEAVES IN THE WHORL.

LESION: LENGTH IN MILLIMETERS OF ONE TYPICAL LESION ON THE FOURTH LEAF OF EACH PLANT ONE WEEK AFTER INOCULATION. LESION LENGTH FOR THE EXPERIMENT RANGED FROM 1.0 TO 10.0 MM. LESION LENGTH OF 2.5 OR LESS IS DEFINED RESISTANT.

S.D.: STANDARD DEVIATION OF LESION LENGTH.

PLANTS: NUMBER OF PLANTS EXAMINED.

RUN: A RUN CONSISTED OF A GROUP OF GENOTYPES INOCULATED AT ONE TIME. GENERALLY ONE GROUP WAS INOCULATED EACH WEEK. RUNS WERE CODED 1 TO 10. SOME ENTRIES WERE EVALUATED IN TWO OR MORE RUNS AND ALL CODES ARE LISTED. IN THIS CASE "10" IS CODED AS "0" IN COMBINATION WITH DIGITS 2 TO 9 BUT WHEN NO OTHER DIGITS ARE PRESENT, THE DESIGNATION OF RUN 10 IS LISTED AS 10.

Inheritance

Three populations were evaluated to obtain preliminary information on the inheritance of resistance. Each population consisted of the parent, F_1 , and F_2 generations. Anthracnose lesion length, range, standard deviation, and number of plants for each generation of each population are presented in Table 3. A limited number of plants were evaluated for some generations and standard deviations were in general larger for these.

The relative positions of the F_1 and F_2 generation means in relation to parent values along the lesion length scale were as follows: Population 1, in the direction of the resistant parent, NC2A12 (1.8 mm); Population 2, between the midparent value (3.6 mm) and the mean of the more susceptible parent, T232 (5.3 mm); and Population 3, near the midparent value (3.7 mm). The F_2 array for Population 2 had a normal distribution form and covered the entire range from 1 to 10 mm.

Table 2. Correlation coefficients between anthracnose means obtained from separate evaluations (or runs).

<u>Evaluation</u>	<u>N</u>	<u>Correlation Coefficient</u>
First vs. second	66	.69 **
First vs. third	11	.48
Second vs. third	11	.81 **

** : Significant at the 1% level.

Table 3. Mean anthracnose lesion length, range, standard deviation, and number of plants for parent, F_1 , and F_2 generations of three populations.

Genotype	Generation	Plants No.	Lesion length, mm		
			Mean	Range	Standard deviation
Population 1 Intermediate x resistant					
NC2A7	Parent	13	4.9	2-9	1.96
NC2A12	Parent	65	1.8	1-6	0.93
NC2A7 x NC2A12	F_1	12	2.7	1-5	1.37
(NC2A7 x NC2A12)	F_2	131	2.3	1-7	1.28
Population 2 Intermediate x resistant					
T232	Parent	21	5.3	3-7	1.10
NC2A12	Parent	65	1.8	1-6	0.93
T232 x NC2A12	F_1	8	5.1	4-7	0.99
(T232 x NC2A12)	F_2	124	4.1	1-10	1.68
Population 3 (Intermediate x resistant) x intermediate					
NC2A7	Parent	13	4.9	2-9	1.96
NC2A12	Parent	65	1.8	1-6	0.93
SC276Q2	Parent	7	4.1	1-7	1.86
(NC2A7 x NC2A12) x SC276Q2	F_1	8	3.5	1-6	2.00
[(NC2A7 x NC2A12) x SC276Q2]	F_2	31	3.9	1-6	1.39

DISCUSSION

Although the results reported herein are preliminary, they should provide guidance for future evaluations. This was a sustained effort to screen the maximum number of genotypes and as a consequence only minimum rechecking and verification was possible. Standard deviations (Tables 1 and 1A) indicate that a relatively large error is associated with many of the estimates of lesion length.

One typical lesion on the fourth leaf of each plant was chosen and measured for length to provide a relative resistance value. Except for the most resistant plants, there was considerable variation in the size of lesions on a single leaf. Plants with only a few lesions presented the greatest difficulty of choice. If there were enough lesions from which to choose a typical one for measurement, the variation in size of lesions did not cause much difficulty. Although the measurement of lesions is time consuming, this measurement should provide a more accurate evaluation of quantitative differences than could be obtained by the arbitrary classification of genotypes into two or three subjective categories or according to a simple numerical rating scale.

Sixty-six genotypes were evaluated two times and 11 three times. The positive correlations (Table 2) between the same genotypes in different evaluations (or runs) indicate that the results were reasonably consistent. We also had 24 genotypes which were obtained from two or more different locations or seed sources and which were handled as separate entries. The correlation coefficient between the lesion lengths of the 24 genotypes from two sources was significant at the 1% level ($r = .60^{**}$).

Because only one isolate of the fungus was used, these results may not be completely applicable to other areas. For example, our lesion length measurements were not significantly correlated at the 5% level with the anthracnose ratings reported by Poneleit et al (8) for the 17 genotypes in common ($r = .24$). Both studies did agree that the inbred 33-16 was in the resistant category. In another comparison involving 50 inbreds, our data and ratings presented by Nicholson and Warren (7) were significantly correlated at the 5% level ($r = .30^*$). Nicholson and Warren (7) also found that the inbred 33-16 was resistant.

We have not compared the results reported herein with field reaction. Our data were obtained from seedlings in an ideal plant growth environment. We inoculated seedlings two weeks old at about the 5-leaf stage and measured the length of lesions one week later. We do not know if this seedling reaction would be directly comparable with either seedling or mature plant field resistance or with mature plant damage which is often due to stalk rot.

Three inbreds (T8, T101, and NC2A12), which are listed as resistant in Table 1 and which were evaluated from separate seed sources, had one or more mean evaluation scores outside the resistant range, i.e., greater than 2.5 mm (Table 1A). T8 from three sources had lesion lengths as follows: 1.8, 2.0, and 3.0 mm. T101 from three sources had the following lesion lengths: 1.8, 2.2, and 3.9 mm. NC2A12 was included in nine runs as a resistant check and had an average lesion length of 1.8 mm (Table 1). Means for the nine runs ranged from 1.2 to 3.1 with two greater than 2.5, viz., 2.9 and 3.1 mm. Lesion lengths for 14 closely related sublines of NC2A12 ranged from 1.2 to 3.9 mm (Table 1A). Only two of the sublines had lesions longer than 2.5 mm. The comparatively consistent performance of

NC2A12 and the short lesion length for two of the sublimes, which averaged as small or smaller than that of any other genotype, indicate that this line may have good potential as a source of resistance.

Our observations on inheritance were not consistent among the three populations and probably not adequate to draw critical general inferences. This is not to imply, however, that the results were not appropriate but rather that the observations were probably specific for each of the three populations. Population 1 was derived from two inbreds having an average relationship of 88%; Population 2 was generated from two unrelated inbreds; and Population 3 was derived from a 3-way combination involving the two closely related inbreds of Population 1 and an unrelated inbred.

Greater differences among parents undoubtedly would have contributed to more discerning inheritance information. The susceptible parents were intermediate for resistance with lesion lengths of 4.1, 4.9, and 5.3 mm. By contrast B37, a widely used susceptible inbred, averaged 7.2 mm; SCGT 0-159, an unreleased line, averaged 8.0 mm and was the most susceptible one observed; and P3369A, a widely grown hybrid and considered a susceptible check in this research, averaged 6.7 mm. We evaluated Populations 1, 2, and 3 because they were available and because we did not have seed of more desirable combinations.

The range in lesion length among F_2 's included resistant plants in each of the three populations; consequently, the transfer of resistance to presently susceptible inbreds appears possible. Ranges for F_2 plants were as follows for Populations 1, 2, and 3, respectively: 1 to 7, 1 to 10, and 1 to 6 (Table 3).

The data reported herein have limitations, as pointed out, such as minimum rechecking of evaluations, variability between runs, limited number of plants, large error associated with mean estimates, lack of verification

with mature plant and field performance, and the use of only one isolate of the fungus. Nevertheless, these data should serve as an initial appraisal of genotype resistance, as a basis for choosing genotypes for further evaluation, and as a guide for considering genotypes having potential in breeding for resistance.

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APPENDIX

THE FOLLOWING APPENDIX TABLE 1A IS A COMPLETE LISTING OF ALL GENOTYPES EVALUATED FOR ANTHRACNOSE AND INCLUDES THE RESISTANT INBREDS PRESENTED IN TABLE 1 (PAGE 7).

TABLE 1A COLUMN HEADINGS ARE AS FOLLOWS:

ENT: EXPERIMENT ENTRY NUMBER OF GENOTYPE.

PEDIGREE: NAME OF GENOTYPE.

SOURCE: FILE DESIGNATION OF SEED.

L.NO.: NUMBER OF LEAVES ON INOCULATION DATE.

PL.HT.: PLANT HEIGHT IN CENTIMETERS ON INOCULATION DATE; HEIGHT MEASURED FROM SOIL TO INTERSECTION OF TOP TWO LEAVES IN THE WHORL.

LESION: LENGTH IN MILLIMETERS OF ONE TYPICAL LESION ON THE FOURTH LEAF OF EACH PLANT ONE WEEK AFTER INOCULATION. LESION LENGTH FOR THE EXPERIMENT RANGED FROM 1.0 TO 10.0 MM. LESION LENGTH OF 2.5 OR LESS IS DEFINED RESISTANT.

S.D.: STANDARD DEVIATION OF LESION LENGTH.

PLANTS: NUMBER OF PLANTS EXAMINED.

RUN: A RUN CONSISTED OF A GROUP OF GENOTYPES INOCULATED AT ONE TIME. GENERALLY ONE GROUP WAS INOCULATED EACH WEEK. RUNS WERE CODED 1 TO 10. SOME ENTRIES WERE EVALUATED IN TWO OR MORE RUNS AND ALL CODES ARE LISTED. IN THIS CASE "10" IS CODED AS "0" IN COMBINATION WITH DIGITS 2 TO 9 BUT WHEN NO OTHER DIGITS ARE PRESENT, THE DESIGNATION OF RUN 10 IS LISTED AS 10.

TABLE IA. COMPLETE LISTING OF CORN GENOTYPES EVALUATED FOR ANTHRACNOSE

ENT	PEDIGREE	SOURCE	L.NO.	PL.HT.	LESION	S.D.	PLANTS	RUN
452	A68-9	ACC 74202	6	20	6.7	1.37	6	10
373	A71	ACC 74162	6	19	6.1	1.46	7	7
14	A498	29(70)	5	16	7.0	1.16	7	1
453	A554	ACC 74203	6	19	5.1	1.25	8	10
295	A619	ACC 74084	5	13	5.2	2.05	8	5
419	A619	ACC 73161	5	15	6.1	1.96	7	8
296	A632	ACC 74085	6	17	6.0	1.31	8	5
454	A635	ACC 74204	6	20	6.0	1.15	4	10
455	A639	ACC 74205	6	25	4.2	0.96	4	10
456	A641	ACC 74206	6	21	5.9	0.69	7	10
457	A654	ACC 74207	5	18	4.4	0.53	7	10
15	AB28A	1280-81(72)	6	17	4.5	1.69	8	1
25	AKH42	977(70)	5	13	4.7	1.25	7	1
26	AKY 107-2	822(72)	5	13	5.0	0.63	6	1
27	AR200	823(72)	5	15	6.1	0.83	8	1
28	AR202	824(72)	4	14	6.8	1.16	8	1
29	AR204	825(72)	5	15	5.1	0.99	10	16
30	AR206	826(72)	5	16	6.8	0.75	6	1
422	AY515	G2121-1	6	14	5.3	1.03	6	9
375	B10	ACC 74164	6	18	5.0	1.51	8	7
31	B14A	34(70)	6	17	6.2	1.06	12	16
1	B37	35(70)	5	17	7.2	0.71	8	9
368	B37	ACC 74157	5	18	7.0	0.53	8	7
214	B41	ACC 74003	5	19	2.8	0.97	9	460
366	B46	ACC 74155	5	19	5.1	1.13	8	7
317	B49	ACC 74106	6	19	4.3	1.38	7	6
318	B52	ACC 74107	6	18	4.1	1.07	7	6
215	B57	ACC 74004	6	19	3.7	1.01	11	40
216	B65	ACC 74005	6	22	2.9	0.95	13	40
319	B68	ACC 74108	6	20	5.6	0.89	5	6
320	B69	ACC 74109	6	19	5.7	1.11	7	6
32	B73	2907(73)	6	19	5.3	1.37	12	16
321	B75	ACC 74110	6	19	5.2	1.04	8	6
322	B76	ACC 74111	5	18	6.2	0.71	8	6
323	B77	ACC 74112	6	20	7.1	0.85	8	6
324	B78	ACC 74113	7	19	5.4	0.53	7	6
325	B79	ACC 74114	7	18	6.0	1.10	6	6
3	C103	2919(73)	4	16	5.2	0.75	6	9
217	CH9	ACC 74006	5	18	4.4	1.27	7	4
34	CI.3A	2261(70)	4	14	5.6	0.74	8	1
367	CI.7	ACC 74156	4	18	3.9	1.73	8	7
35	CI.21	1258(72)	5	15	5.5	1.31	8	1
36	CI.21E	38(70)	5	17	4.1	2.07	19	150
297	CI.21E	ACC 74086	5	15	5.9	2.04	7	5
371	CI.28A	ACC 74160	5	16	6.6	1.51	7	7
316	CI.31A	ACC 74105	5	15	5.4	0.53	7	6
218	CI.42A	ACC 74007	5	15	3.1	1.52	18	460
423	CI.44	52349(65)	6	17	7.4	0.74	8	9
298	CI.66	ACC 74087	5	15	5.9	0.83	8	5
37	CI.90C	1282&3(72)	5	18	2.1	1.04	23	150
372	CI.91B	ACC 74161	6	18	5.6	0.79	7	7
219	CI.187-2	ACC 74008	5	16	4.1	1.52	9	46
420	CM37	ACC 73162	5	21	6.0	0.76	8	8
38	CM05	28(70)	5	17	4.9	1.73	8	1
39	F6	1372(70)	5	18	6.1	0.64	8	1
40	F44	1381(70)	5	18	4.2	1.16	8	1
48	GA.209	1249(72)	5	17	6.1	0.64	8	1
441	GE70-242-5	G1792A-2	4	14	4.8	1.10	5	9

TABLE 1A (CONTINUED)

ENT	PEDIGREE	SOURCE	L.NO.	PL.HT.	LESION	S.D.	PLANTS	RUN
424	GE82	G1791A-3	5	17	3.8	1.30	5	9
426	GE MEF 156-55-2	G2122-1	5	17	5.8	0.50	4	9
221	GT112 (MO.)	ACC 74010	5	15	3.8	2.73	9	49
49	GT112 (NC)	53(70)	5	16	6.3	1.25	7	1
418	GT154	ACC 73154	6	16	5.1	0.69	7	8
222	H27	ACC 74011	6	11	5.2	0.71	8	9
342	H42	ACC 74131	5	17	5.2	0.75	6	6
223	H49	ACC 74012	6	15	4.4	2.07	5	4
343	H49	ACC 74132	6	21	6.0	1.41	2	6
344	H54	ACC 74133	6	19	4.2	2.36	4	6
345	H60	ACC 74134	4	14	5.4	2.88	5	7
2	H84	2908(73)	6	17	4.9	1.35	7	9
50	H84	AG ALUMNI	5	18	5.7	1.70	7	1
346	H84	ACC 74135	5	18	4.6	1.19	8	7
347	H88	ACC 74136	5	18	6.0	2.00	7	7
224	H89	ACC 74013	5	14	6.4	1.30	8	4
348	H91	ACC 74137	6	19	6.0	1.41	6	7
349	H92	ACC 74138	6	17	5.4	1.30	8	7
225	H93	ACC 74014	5	16	5.7	0.82	6	4
350	H93	ACC 74139	5	20	6.8	0.46	8	7
351	H94	ACC 74140	5	20	5.9	0.83	8	7
352	H95	ACC 74141	5	18	6.8	0.89	8	7
353	H96	ACC 74142	5	17	4.4	0.74	8	7
354	H97	ACC 74143	6	15	5.8	1.16	8	7
355	H98	ACC 74144	5	18	2.9	0.83	8	7
356	H99	ACC 74145	5	18	3.8	1.04	8	7
357	H100	ACC 74146	6	19	5.8	0.71	8	7
374	HPR-1	ACC 74163	5	14	2.5	1.05	6	7
358	HSYN.C-8-1	ACC 74147	5	17	3.3	1.63	6	7
359	HSYN.C-35-1	ACC 74148	5	21	7.0	0.53	8	7
360	HS.SYN.A-103	ACC 74149	6	20	6.0	0.93	8	7
361	HS.SYN.A-124	ACC 74150	5	19	5.0	3.03	6	7
362	HS.SYN.A-148	ACC 74151	5	18	5.4	1.52	5	7
363	HS.SYN.A-163	ACC 74152	6	16	7.3	1.37	6	7
364	HS.SYN.A-355	ACC 74153	6	21	4.0	1.83	4	7
365	HS.SYN.A-364	ACC 74154	5	16	5.0	0.76	8	7
226	HY	ACC 74015	5	17	2.6	1.00	20	490
227	HY2LG1	ACC 74016	5	14	5.6	1.40	7	4
228	HY2LG2	ACC 74017	5	12	6.6	0.92	8	4
229	K4	ACC 74018	5	14	4.3	1.11	7	4
230	K6	ACC 74019	6	16	3.9	1.57	16	40
370	K61-1	ACC 74159	6	18	4.0	0.82	4	7
231	K63	ACC 74020	5	14	3.1	1.44	13	40
232	K148	ACC 74021	6	15	4.1	1.27	9	4
233	KY5	ACC 74022	5	09	6.3	1.22	9	4
234	KY27	ACC 74023	5	14	5.5	1.00	4	4
369	KY36-11	ACC 74158	5	14	4.8	0.84	5	7
58	KY61-2335	827(72)	4	14	5.6	1.19	8	1
59	KY63-56	828(72)	4	16	4.8	1.72	6	1
235	KY128	ACC 74024	5	16	5.5	2.12	2	6
236	KY222	ACC 74025	6	15	5.4	0.55	5	6
55	KY226	839(72)	6	21	5.6	1.13	7	1
56	KY3812	830(72)	5	21	6.1	0.83	8	1
57	KY3833	829(72)	5	14	5.1	1.07	7	1
60	KYB106	832(72)	5	16	2.8	1.15	23	150
61	KYB110	831(72)	5	13	6.0	0.76	8	1
237	L317	ACC 74026	5	12	4.6	1.25	13	46
62	L578	80655-2(68)	5	19	7.8	0.71	8	1

TABLE 1A (CONTINUED)

ENT	PEDIGREE	SOURCE	L.NO.	PL.HT.	LESION	S.D.	PLANTS	RUN
63	M14	43(71)	4	14	4.3	1.98	7	1
238	M14LG1	ACC 74027	4	15	3.4	1.29	11	40
64	MO.5	2163(70)	4	14	5.2	0.71	8	1
299	MO.6	ACC 74088	5	14	4.5	1.31	8	5
239	MO.8W	ACC 74028	5	16	6.5	1.20	8	4
240	MO.9W	ACC 74029	5	15	6.4	1.06	8	4
65	MO.10	51(71)	6	21	6.8	0.89	8	1
4	MO.17	2905(73)	5	14	5.8	0.98	6	9
66	MO.18W	838(72)	5	15	6.4	1.40	7	1
300	MO.18W	ACC 74089	5	15	4.3	1.60	7	5
241	MO.21A	ACC 74030	5	15	4.8	0.71	8	4
301	MO.22	ACC 74090	5	16	5.8	1.10	5	5
290	MO.68:327-1	ACC 74079	5	13	6.9	1.77	7	5
291	MO.68:337-1	ACC 74080	5	17	3.4	0.92	8	5
292	MO.69:3094-1	ACC 74081	5	17	6.1	0.90	7	5
293	MO.69:3124-2	ACC 74082	5	15	5.7	0.95	7	5
294	MO.69:3180-1	ACC 74083	5	15	7.2	0.89	8	5
212	MO.401(B37WX)	ACC 74001	5	14	7.2	1.39	9	4
213	MO.402(B41WX)	ACC 74002	5	18	2.8	1.26	15	40
243	MO.403(MO.3WX)	ACC 74032	6	16	4.4	0.92	8	4
244	MO.501W	ACC 74033	6	09	5.3	0.75	13	46
245	MO.502W	ACC 74034	5	14	4.2	1.33	6	4
246	MO.503W	ACC 74035	5	17	5.1	1.36	8	4
247	MO.504W	ACC 74036	5	15	4.4	0.79	7	5
248	MO.505W	ACC 74037	6	16	6.3	0.76	7	5
249	MO.506W	ACC 74038	5	17	4.0	1.41	2	9
250	MO.507W	ACC 74039	5	18	4.2	1.60	11	50
251	MO.508W	ACC 74040	5	18	4.0	1.69	8	5
252	MO.509W	ACC 74041	5	14	3.7	1.03	6	5
253	MO.510W	ACC 74042	5	13	4.8	1.48	5	50
220	MO.ETD	ACC 74009	5	12	4.8	1.92	5	6
242	MO.G	ACC 74031	5	16	4.5	1.20	8	4
264	MO.Q66-7	ACC 74053	4	14	6.6	0.79	7	5
265	MO.Q67-9	ACC 74054	6	15	1.6	0.74	14	50
266	MO.Q97-10-1-4-1	ACC 74055	5	17	7.7	2.08	3	5
268	MO.Q98-10-1-4-1	ACC 74057	5	11				5
67	MP313	49(71)	6	21	7.4	0.52	8	1
254	MP315	ACC 74043	5	16	5.5	1.72	7	5
68	MP412	1250(72)	5	16	4.0	0.76	8	1
69	MP460	833(72)	6	16	6.0	0.76	8	1
70	MP482	834(72)	5	18	6.4	0.98	7	1
427	MP486	ACC 9001	5	10			1	9
71	MP488	835(72)	6	18	5.7	0.49	7	1
72	MP490	841(72)	6	19	4.6	0.94	14	16
73	MP494 (F-039-1)	843(72)	6	18	6.1	0.64	8	2
74	MS1334	30(70)	5	13	6.5	0.55	6	2
458	MT42	ACC 74208	6	16	5.4	0.52	8	10
255	N6	ACC 74044	5	15	6.0	2.24	7	5
256	N6G	ACC 74045	5	13	5.7	1.11	7	5
326	N6J	ACC 74115	6	18	4.6	0.92	8	6
258	N7A	ACC 74047	6	15	3.8	1.30	5	5
257	N38A	ACC 74046	6	16	3.6	1.27	7	5
199	NC1P	2152(70)	5	15	3.6	1.33	13	40
201	NC2P	2159(70)	5	16	6.0	1.20	8	4
9	NC2A7	1274(72)	6	21	5.7	2.50	6	8
9	NC2A7	3002(73)	6	19	4.0	1.00	7	9
10	NC2A12	3004(73)	5	19	1.8	0.93	65	2345678890
175	NC2A12	3026(73)	5	18	3.8	0.89	8	3
176	NC2A12	3027(73)	5	17	3.9	1.64	8	3
177	NC2A12	3028(73)	6	20	1.8	0.71	8	3
178	NC2A12	3029(73)	5	21	2.0	1.10	6	3

TABLE 1A (CONTINUED)

ENT	PEDIGREE	SOURCE	L.NO.	PL.HT.	LESION	S.D.	PLANTS	RUN
179	NC2A12	3030(73)	6	20	1.4	0.74	15	30
180	NC2A12	3031(73)	5	18	2.1	0.83	8	3
181	NC2A12	3032(73)	5	18	1.9	0.69	7	3
182	NC2A12	3033(73)	5	18	1.2	0.42	10	30
183	NC2A12	3034(73)	5	19	1.6	1.51	7	3
184	NC2A12	3035(73)	5	18	1.6	0.74	8	3
185	NC2A12	3036(73)	5	18	1.7	0.72	15	30
186	NC2A12	3037(73)	6	19	1.8	0.89	8	3
187	NC2A12	3038(73)	5	20	2.3	1.21	6	3
188	NC2A12	3039(73)	6	17	1.8	0.75	6	3
200	NC2A44	1276(72)	6	18	3.3	1.33	14	40
202	NC3L2	1277(72)	5	17	4.0	1.73	7	4
203	NC3P	2173(70)	5	12	3.9	1.24	8	4
75	NC7	1031(72)	5	16	5.6	1.19	8	2
76	NC7, 3D2	715-3(70)	5	14	6.9	0.69	7	2
428	NC7, 5HB10	1214-1(72)	6	15	5.6	1.27	7	9
205	NC7HB10	2171(70)	6	13	2.4	1.16	14	40
77	NC13	2201(73)	5	16	6.9	0.64	8	2
78	NC18	2263(70)	5	15	6.1	1.68	7	2
429	NC33 (5492(62))	1901(64)	5	17	4.8	0.96	4	9
79	NC34	1303(72)	5	18	5.4	1.30	8	2
80	NC44	82446(68)	4	15	6.0	0.00	7	2
81	NC61	73(71)	6	18	6.7	0.95	7	2
82	NC83	1307(72)	5	17	5.5	1.60	8	2
83	NC87	2265(70)	5	14	4.6	1.60	8	2
84	NC89	2202(73)	6	17	5.1	1.46	8	2
85	NC216	2181(70)	5	21	4.9	0.99	8	2
86	NC220	1252(72)	5	19	3.9	1.86	16	20
87	NC222	1253(72)	5	17	4.9	2.19	7	2
88	NC224	1254(72)	5	18	4.9	0.64	8	2
430	NC226	6317(62)	5	18	4.1	1.00	14	90
89	NC230	1255-1(72)	5	19	5.9	0.99	8	2
90	NC232	1256(72)	5	17	5.9	0.64	8	2
91	NC234	1315(72)	5	14	5.3	1.03	6	2
92	NC236	2417-1(70)	4	15	4.4	0.74	8	2
93	NC238	1257(72)	5	16	4.8	0.46	8	2
94	NC240	1299(72)	6	14	5.4	1.51	8	2
95	NC240A	1268(72)	5	16	4.0	1.58	14	290
431	NC601	(1962)	5	12	3.8	1.60	6	9
432	NC602	(1962)	5	12	7.3	0.76	7	9
96	NC605D	1295(72)	5	18	4.4	0.79	7	2
206	NC73L40	2155(70)	5	16	3.6	1.68	15	40
207	NC73L53	2167(70)	5	18	4.8	1.04	8	4
208	NC73L6	2157(70)	5	15	4.9	1.07	7	4
209	NC8HL6	1278(72)	6	16	3.4	1.26	13	40
210	NC8HL8	1279(72)	6	18	4.4	0.98	7	4
211	NC8LP2	2164(70)	4	15	4.5	0.84	6	4
16	NC ACC.1001	1284(72)	5	18	7.1	0.64	8	1
17	NC ACC.1002	1285(72)	5	22	5.5	1.07	8	1
18	NCARG COMP A	1196(72)	5	20	4.8	1.55	17	169
19	NCARG COMP B	1197(72)	6	20	4.7	1.60	8	19
20	NCARG COMP S	1198(72)	5	22	7.1	1.73	8	1
21	NCARG A1	1199(72)	5	20	4.8	0.71	8	1
22	NCARG STI	1200(72)	5	23	6.9	0.64	8	1
23	NCARG P465	1201(72)	5	19	4.3	1.38	7	1
24	NCARG ZN6	1202(72)	6	19	4.4	1.77	8	1
33	NCC5D8	1259(72)	5	15	6.2	0.71	8	1
41	NCF44, 4DSC	1260(72)	5	16	6.0	0.53	8	1
43	NCG2H1	1261(72)	6	17	6.0	0.58	7	1
44	NCG2HN	1770-1(73)	5	15	5.3	0.82	6	9
44	NCG2HN	1262(72)	6	16	6.0	1.29	7	1
45	NCG3N1	1263(72)	5	15	3.6	1.83	12	19

TABLE 1A (CONTINUED)

ENT	PEDIGREE	SOURCE	L.NO.	PL.HT.	LESION	S.D.	PLANTS	RUN
46	NCG5D12	1264(72)	5	15	4.6	1.75	11	19
12	NCG5D15	1771-1(73)	5	16	6.4	1.52	5	9
47	NCG5D15	1265(72)	5	17	6.4	1.85	8	1
306	NCG5	ACC 74095	5	17	5.0	1.22	5	6
307	NCG15	ACC 74096	5	17	6.0	0.53	8	6
308	NCG115	ACC 74097	5	19	3.4	0.74	8	6
309	NCG168	ACC 74098	6	14	5.7	2.52	3	6
310	NCG204	ACC 74099	6	18	6.0	1.22	5	6
311	NCG208	ACC 74100	6	22	4.5	1.20	8	6
312	NCG213	ACC 74101	5	16	7.0	1.41	2	6
313	NCG217	ACC 74102	5	18	6.9	0.64	8	6
314	NCGR12	ACC 74103	4	12	5.5	1.22	6	69
315	NCGR35	ACC 74104	6	13	5.4	1.19	8	6
51	NCJLM1	1266(72)	5	16	6.5	0.53	8	1
52	NCJLMA	2156(70)	6	15	6.3	1.37	6	1
53	NCK5Y2-3	1267(72)	5	18	4.6	1.19	8	1
54	NCK5Y6-B	2441-1(70)	5	14	6.2	0.71	8	1
108	NCRC1	2175(70)	6	16	5.8	0.41	6	2
109	NCRS14	1269(72)	6	19	5.6	1.19	8	2
137	NCT3N4	2182(70)	6	21	7.6	1.19	8	3
138	NCT4HB8	2177(70)	5	17	7.1	0.38	7	3
139	NCT4HB13	2184(70)	5	19	4.6	0.52	8	3
140	NCT4HB15	2179(70)	5	19	5.0	1.07	8	3
141	NCT5HB1	1272(72)	6	21	6.0	0.58	7	3
124	NCT6W	728-3(70)	4	14	4.9	1.77	7	2
142	NCTJ526-2	2266(70)	5	19	6.1	0.99	8	3
143	NCTUX 6	1387(71)	5	16	6.1	0.99	8	3
144	NCTUX 7	1391(71)	6	18	4.6	0.74	8	3
145	NCTUX 7E	1396-1(71)	5	17	4.0	1.51	8	3
146	NCTUX 12	1399-1(71)	5	15	5.0	0.82	7	3
147	NCTUX 15	1403(71)	6	15	4.1	1.62	12	30
148	NCTUX 53	1407(71)	5	14	4.2	0.75	6	3
149	NCTUX 61	1413(71)	5	17	7.4	2.00	8	3
150	NCTUX 62	1415(71)	6	15	3.8	1.34	12	39
151	NCTUX 65	1419(71)	6	21	5.4	0.79	12	39
151	NCTUX 65	1261(70)	6	20	4.5	0.93	8	6
152	NCTUX 66	1424(71)	5	22	6.0	0.93	8	3
153	NCTUX 71	1427(71)	6	22	5.8	1.04	8	3
154	NCTUX 72	1431(71)	6	20	5.9	1.25	8	3
155	NCTUX 73	1436-1(71)	6	20	4.0	1.07	8	3
156	NCTUX 78	1439(71)	6	18	7.0	0.93	8	3
459	ND203	ACC 74209	5	19	2.3	1.38	7	10
97	NY821	57(71)	4	12	3.6	1.51	7	2
98	NYX65	55(71)	5	19	1.6	1.36	16	20
259	OH7A	ACC 74048	6	10				5
99	OH7B	1251(72)	5	11	6.3	0.76	7	2
100	OH43	32(70)	5	16	4.0	1.70	21	290
260	OH43	ACC 74049	5	11	3.0	1.83	4	5
261	OH43LG1	ACC 74050	5	13	4.7	2.00	7	5
433	OH45	4683(73)	6	18	6.0	0.63	6	9
341	OH509	ACC 74130	6	20	6.9	1.13	8	6
101	OH513	849(72)	5	13	6.0	1.00	7	2
102	OH514	2910(73)	6	16	7.7	1.03	6	2
263	OH514	ACC 74052	5	16	7.3	1.70	7	5
103	OH545	41(71)	5	18	3.8	1.48	18	270
262	OH545	ACC 74051	5	12	3.0	1.41	2	5
302	OH545	ACC 74091	6	20				6
104	PA33	31(71)	5	15	5.4	1.06	8	2
434	PA36	G1790A-1	6	16	7.0	0.71	5	9
105	PA70	29(71)	5	18	3.6	1.51	8	2

TABLE 1A (CONTINUED)

ENT	PEDIGREE	SOURCE	L.NO.	PL.HT.	LESION	S.D.	PLANTS	RUN
107	PA91	2911(73)	5	25	4.9	0.83	8	2
106	PA887P	27(71)	4	16	1.9	0.99	15	270
267	R75	ACC 74056	5	14	2.8	1.28	8	59
269	R76	ACC 74058	5	13	5.4	2.19	5	5
271	R78	ACC 74060	4	15	3.8	1.49	8	5
270	R84	ACC 74059	5	13				5
272	R181BLG2	ACC 74061	5	17	5.2	0.89	8	5
273	R801	ACC 74062	6	17	5.9	0.90	7	59
274	R802	ACC 74063	5	12	6.2	0.71	8	5
275	R802A	ACC 74064	5	14	5.5	1.29	4	5
276	R803	ACC 74065	4	15	3.9	1.90	9	50
277	R804	ACC 74066	5	12	5.8	1.26	4	5
384	SC33RS3	ACC 74173	5	19	5.8	1.58	8	7
383	SC55	ACC 74172	6	21	2.3	1.21	6	7
382	SC78RS3#	ACC 74171	5	18	5.9	1.55	8	7
381	SC152	ACC 74170	5	18	6.9	0.99	8	7
110	SC212	850(72)	5	18	3.2	0.80	14	20
111	SC213R	532(72)	5	17	4.8	0.89	8	2
112	SC229	846(72)	6	17	5.4	0.74	8	2
380	SC235	ACC 74169	6	21	2.8	1.50	4	7
113	SC254	851(72)	5	23	4.1	0.90	7	2
8	SC276Q2	869(72)	5	16	4.1	1.86	7	9
114	SC276V	1203(72)	5	23	6.0	1.20	8	2
115	SC276W	1205(72)	5	19	5.9	1.13	8	2
116	SC301	852(72)	4	18	6.8	1.49	8	2
117	SC301D	840(72)	5	20	6.8	0.89	8	2
118	SC343	974(70)	5	21	6.6	0.52	8	2
379	SC359	ACC 74168	4	17	7.3	1.97	6	7
376	SC375	ACC 74165	6	18	5.6	0.53	7	7
377	SC390	ACC 74166	6	18	5.6	0.52	8	7
378	SC392	ACC 74167	5	17	4.4	1.19	8	7
388	SC401	ACC 74177	5	18	5.1	1.13	8	7
119	SC402	853(72)	5	22	5.6	1.60	8	2
120	SC403	854(72)	5	20	4.6	1.27	7	2
121	SC413	855(72)	5	22	4.6	2.07	8	2
387	SC415RS3	ACC 74176	5	17	5.3	0.52	6	7
386	SC419	ACC 74175	5	21	4.6	1.51	7	7
122	SC441	856(72)	6	22	4.6	1.41	8	2
385	SC443RS5#	ACC 74174	6	22	4.2	0.46	8	7
123	SC444	857(72)	6	22	6.1	1.13	8	2
400	SC448RS3	ACC 74189	6	19	4.3	0.76	7	7
399	SC451RS5	ACC 74188	6	23	2.7	2.08	3	7
398	SC453RS5	ACC 74187	5	18	2.8	1.94	6	7
397	SC455RS5	ACC 74186	6	24	4.9	1.95	7	7
396	SC456RS5	ACC 74185	6	19	4.4	0.92	8	7
395	SC457RS5	ACC 74184	6	18	4.6	1.30	8	7
394	SC459RS4	ACC 74183	6	22				7
393	SC463RS4	ACC 74182	6	18	5.0	1.00	5	7
392	SC469RS5	ACC 74181	6	17	3.5	1.29	4	7
391	SC482RS5	ACC 74180	6	18	4.8	0.75	6	7
389	SC488RS5	ACC 74178	6	23	6.0	0.76	8	7
390	SC483RS5	ACC 74179	5	18	2.8	1.47	6	7
407	SC491	ACC 74196	6	19	5.7	1.11	7	8
403	SCGT 0-159	ACC 74192	5	19	8.0	2.24	7	8
411	SCGT 0-538A	ACC 74200	6	20	5.3	1.25	7	8
401	SCGT 0-909	ACC 74190	5	16	6.4	1.06	8	8
406	SCGT 0-956	ACC 74195	5	17	3.0	0.93	8	8
408	SCGT 0-1836	ACC 74197	6	19	4.1	0.90	7	8
402	SCGT 1-919	ACC 74191	5	17	5.2	1.56	8	8
404	SCGT 9-338	ACC 74193	5	17	7.9	1.36	8	8

TABLE 1A (CONTINUED)

ENT	PEDIGREE	SOURCE	L.NO.	PL.HT.	LESION	S.D.	PLANTS	RUN
405	SCGT 91549-38A	ACC 74194	5	15	6.2	0.46	8	8
409	SCGT B539	ACC 74198	6	17	3.2	2.05	5	8
410	SCGT WPT4	ACC 74199	6	19	4.9	0.99	8	8
437	SD PURPLE	G2123-1						9
438	SD5	4684(73)	6	20	5.1	1.46	8	9
125	T8	37(70)	6	16	2.0	1.28	12	20
278	T8	ACC 74067	6	12				5
303	T8	ACC 74092	6	19	3.0	0.82	4	6
328	T8	ACC 74117	7	18	1.8	0.75	6	6
417	T13	ACC 73153	6	14	3.4	1.72	7	8
279	T61	ACC 74068	5	15	6.1	1.35	7	5
126	T61W.C.	842(72)	5	17	5.3	0.76	7	2
127	T101	858(72)	6	20	1.8	0.83	12	20
280	T101	ACC 74069	5	16	2.2	1.23	10	50
128	T101VR	859(72)	5	19	3.9	1.04	13	26
129	T105	847(72)	6	19	5.1	2.03	8	2
281	T115	ACC 74070	4	14	3.8	1.10	5	5
304	T115	ACC 74093	5	18	4.1	0.83	8	6
282	T129	ACC 74071	5	17	5.9	1.07	7	5
283	T133	ACC 74072	5	14	4.0	0.76	8	5
130	T143	860(72)	4	16	6.1	0.90	7	2
131	T204	1291(72)	5	20	6.4	0.52	8	3
286	T204	ACC 74075	5	20	5.6	1.06	8	5
305	T204	ACC 74094	5	16	5.2	0.84	5	6
284	T206	ACC 74073	5	12	6.2	1.28	8	5
132	T220A	861(72)	5	20	4.2	0.89	8	3
133	T226	2154(70)	5	20	2.7	1.42	10	30
134	T232	1248(72)	5	20	5.3	0.99	14	38
285	T232	ACC 74074	4	13	5.3	1.38	7	5
135	T238	862(72)	5	16	2.1	1.06	15	30
136	T240	863(72)	5	19	3.0	2.31	13	30
287	T315	ACC 74076	5	16	3.9	0.64	8	5
157	TX29A	864(72)	6	22	5.5	0.76	8	3
158	TX76	865(72)	5	21	5.1	1.46	8	3
159	TX601	1247(72)	6	22	5.4	1.85	8	3
160	TX5855	867(72)	5	19	5.7	1.37	12	39
161	TX7159	868(72)	5	26	4.9	1.73	8	3
460	V3	ACC 74210	5	14	4.8	1.33	6	10
162	VA.14	2886(73)	5	18	5.4	1.40	7	3
163	VA.16	2887(73)	5	22	5.1	1.07	7	3
164	VA.17	2888(73)	5	16	5.0	1.00	7	3
165	VA.18A	2889(73)	5	20	3.8	1.39	8	3
166	VA.21A	2890(73)	5	18	2.9	1.44	16	30
329	VA.21C	ACC 74118	5	18	2.9	0.83	8	6
167	VA.22B	2891(73)	4	16	5.5	1.07	8	3
168	VA.23	2892(73)	5	17	5.8	0.75	6	3
169	VA.24	2893(73)	5	19	3.9	0.64	8	3
170	VA.26	2894(73)	5	19	5.6	1.19	8	3
330	VA.30	ACC 74119	5	17	2.0	0.82	4	6
171	VA.33	2895(73)	6	20	5.4	0.52	8	3
172	VA.35	2896(73)	6	19	5.0	1.07	8	3
173	VA.36	2897(73)	5	18	5.6	0.79	7	3
331	VA.36	ACC 74120	5	17	4.8	0.71	8	6
332	VA.37	ACC 74121	6	21	2.0	0.82	7	6
333	VA.38	ACC 74122	6	21	6.2	1.04	8	6
334	VA.39	ACC 74123	6	22	5.4	0.74	8	6
335	VA.46	ACC 74124	5	20	3.6	1.19	8	6
336	VA.50	ACC 74125	6	23	6.0	0.89	6	6
337	VA.52	ACC 74126	6	19	4.9	0.69	7	6
174	VA.58	2904(73)	5	14	6.4	0.74	8	3

TABLE 1A (CONTINUED)

ENT	PEDIGREE	SOURCE	L.NO.	PL.HT.	LESION	S.D.	PLANTS	RUN
189	VA.59	2898(73)	5	15	1.5	1.27	13	40
338	VA.60	ACC 74127	5	13	3.2	0.50	4	6
339	VA.60	ACC 74128	5	17	4.8	1.04	8	6
190	VA.61	2900(73)	4	14	3.8	0.96	4	4
191	VA.84	2901(73)	5	19	3.0	1.26	13	40
192	VA.85	2902(73)	5	18	5.1	1.34	7	4
193	VA.91	2903(73)	4	16	5.9	1.36	8	4
340	VA.91	ACC 74129	6	22	6.2	0.71	8	6
327	VA.W6	ACC 74116	6	19	5.4	0.92	8	6
194	W59M	27(70)	5	14	5.8	0.71	8	4
195	W64A	31(70)	6	18	3.6	1.26	16	40
196	W103	25(70)	5	16	7.6	1.19	8	4
461	W182B	ACC 74211	5	16	7.2	1.04	8	10
197	WD	26(70)	6	13	5.4	1.41	8	4
198	WF9	33(70)	6	20	2.1	1.06	16	40
288	WF9	ACC 74077	5	15	2.0	0.63	6	5
204	33-16	39(71)	5	16	1.6	0.63	16	40
412	NC2A7X2A12 F1	941X42(72)	6	21	2.7	1.37	12	80
413	(NC2A7X2A12)#F2	G1690#	6	20	2.3	1.28	131	8
462	(2A7X12)SC276Q2	875X6(72)	6	20	3.5	2.00	8	10
414	(2A7X12)SC276Q2	F2MAC3-72	6	21	3.9	1.39	31	8
415	NC2A12XT232 F1	1245X8(72)	6	23	5.1	0.99	8	8
416	(NC2A12XT232)F2	3869#(72)	5	21	4.1	1.68	124	8
7	B37XH84	AG ALUMNI	5	19	5.9	0.64	8	9
463	NCG2HNX85D15	247X6(70)	6	20	5.2	0.75	6	10
13	NOGASPE	G2202X2199	5	20	4.8	0.84	5	9
6	NC7617	425X26(70)	5	19	4.0	1.41	8	9
5	P3369A	2-2-(73)	5	23	6.7	1.34	78	1234567890
425	IQANA	MAR 1971	6	17	5.7	1.63	6	9
436	SENECA CHIEF	MAC3-22-73	6	20	7.4	1.06	8	9
421	ALLISON-POPCORN	ACC 73155	5	12	5.6	1.06	8	9
42	FLA SYN 5B N	2549X-1(73)	5	21	5.9	1.55	8	1
435	SATHI	G2116-1	6	24	6.3	1.98	7	9
439	TEHUA	FIKE	6	22	5.2	1.48	5	9
440	TUXPEND	PLY(1966)	6	20	4.3	1.75	6	9
289	ZAPALOTE CHICO	ACC 74078	6	21	5.8	1.16	8	5
442	COAH. 36	4005(73)	6	16	7.7	1.51	6	9
443	GRO. 194	4001(73)	6	18	5.2	1.75	8	9
444	JAL. 187	4007(73)	6	25	2.9	1.46	7	9
445	OAX. 75	4004(73)	6	26	7.6	0.79	7	9
446	PUE. 75	4003(73)	6	23	5.4	0.98	7	9
447	PUE. 203	4002(73)	5	23	3.6	1.41	8	9
448	QRO. 49	4006(73)	6	25	5.0	1.00	7	9
449	SLP. 46	4008(73)	6	23	5.4	1.14	5	9
450	SLP. 58	4009(73)	5	21	5.5	1.31	8	9
451	SLP. 72	4010(73)	6	24	3.8	2.14	6	9