

Varieties: When the three dates of planting are averaged the yield in tons of roots per acre for the German Commercial, U. S. 200 x 215 and the hybrid are almost identical. The yield of the American commercial variety was approximately a ton per acre greater. This difference is just short of statistical significance. In quality the German and American commercial varieties are approximately equal. While U. S. 200 x 215 is slightly higher in quality than either of the commercials the difference is less than that required for statistical significance. As usual the hybrid exhibits slightly lower percent sucrose accompanied by lower purity. The differences are statistically significant. The yield of sugar per acre from the hybrid is probably significantly less than that from the American Commercial. None of the other differences in yield of sugar per acre reach the level of statistical significance. From other tests it appears possible that the selection of the hybrid used in this test in 1939 is not quite the equal of the selection used in the 1938 test although both were selected $F_{4,5}$.

Agronomic Test of Leaf-Spot-Resistant Varieties

Varieties:

U. S. 200 x 215 was compared with the parent variety U. S. 215 and six other leaf-spot-resistant varieties as well as with Synthetic Check and a local variety. The latter was the American commercial ~~variety~~ which extensively used in this locality; seed of the local variety as issued to growers was used. (See following page for list of varieties and pedigree.)

General:

This test was planted as a 10 x 10 Latin square. The plots were eight rows, 30 feet long and the spacing in the row was 12 inches. Good to excellent stands were secured. On most of this test top growth was unusually scanty. In September a trace of leaf spot developed; the infection was so late and the development of the disease so light that leaf spot readings were not attempted. Yield variability within replications and varieties was unusually great, resulting in a relatively high standard error. Plot and general summaries follow.

AGRONOMIC TEST OF LEAF SPOT RESISTANT VARIETIES
 FORT COLLINS, COLORADO, 1939

No.	Variety	Description
1	U.S. 215	From Seed Committee increase 1937
2	U.S. 200 X 215	1938 Com'l seed from A.C.S.
3	S-1919-0	F ₂ , U.S. 200 X 215; 1 : 1
4	S-1913-00	Cross of F ₁ 's: 200 X 215 X 215 X 30604-0
5	S-55-00	Double cross: 200 X 30541-0 X 215 X 30604-0
6	S-1903-02	Top cross, Syn. Var. X Resist. Inbr.
7	S-1901-00	Compound cross of progenies of 4 F ₁ 's
8	U.S. 217	Com'l 1937
9	Synthetic Check	F ₁ from Las Cruces
10	Local variety	

AGRONOMIC TEST OF LEAF SPOT RESISTANT VARIETIES
FORT COLLINS, COLORADO, 1939

PLOT SUMMARIES.

Variety Number	Plot	Beets	T. Beets	%	App. Coef	Lbs. Sug. per A.	
	No.	Harv.	Per A.	Sucr.	of Pur.	Gross	Ind. Av.
1. U.S. No. 215	219	168	17.78	17.10	92.95	6081	5652
	221	170	16.44	16.80	92.25	5523	5095
	234	171	12.15	16.75	92.90	4071	3782
	250	164	15.37	17.85	92.70	5487	5086
	255	165	13.15	17.25	94.25	4536	4275
	267	172	12.70	17.75	94.10	4510	4244
	273	169	9.77	16.75	93.50	3274	3061
	282	168	11.11	17.05	92.85	3788	3517
	298	160	8.31	16.65	92.75	2766	2565
	306	157	14.19	16.60	94.65	4712	4460
	Mean		166	13.10	17.06	93.29	4475
2. U.S. 200 X 215	214	173	20.94	16.55	90.05	6930	6240
	226	172	16.52	17.65	93.35	5833	5445
	238	166	14.48	18.00	92.50	5214	4823
	243	172	12.35	17.75	92.70	4384	4064
	260	162	11.69	17.65	93.50	4126	3858
	269	172	10.23	16.90	93.30	3458	3226
	277	169	11.76	17.25	92.95	4058	3772
	281	161	10.52	16.95	92.35	3566	3293
	295	156	6.98	15.50	92.90	2163	2009
	302	163	14.86	17.40	91.65	5172	4740
	Mean		167	13.93	17.16	92.52	4490
3. 81919 - 0	212	165	18.34	17.20	92.35	6309	5826
	228	165	15.83	17.50	92.20	5542	5110
	233	165	12.89	17.20	93.25	4433	4134
	249	165	12.60	17.65	92.15	4446	4097
	257	166	12.83	16.70	94.10	4285	4032
	261	163	11.13	16.85	94.35	3751	3539
	280	152	12.41	17.10	93.50	4246	3970
	285	159	7.35	15.95	94.30	2346	2212
	296	157	10.45	17.15	92.85	3586	3330
	304	161	12.75	16.30	93.05	4156	3867
	Mean		162	12.66	16.96	93.21	4310

<u>Variety Number</u>	<u>Plot No.</u>	<u>Beets Harv.</u>	<u>T. Beets Per A.</u>	<u>% Sugar.</u>	<u>App. Coef of Pur.</u>	<u>Lbs. Sug. per A.</u>	
						<u>Gross</u>	<u>Ind. Av.</u>
4. 81913 - 00	215	157	17.92	17.30	93.65	6202	5808
	229	171	18.52	17.25	93.45	6389	5971
	231	168	11.99	16.95	93.30	4066	3794
	244	170	13.71	17.30	93.55	4743	4437
	258	167	11.05	17.05	93.50	3768	3523
	262	172	14.32	17.75	94.00	5085	4780
	276	172	9.92	16.65	93.05	3305	3075
	287	158	9.34	17.05	93.45	3186	2977
	293	162	9.20	16.90	92.55	3109	2877
	310	162	13.07	16.65	93.00	4352	4047
	Mean		166	12.90	17.08	93.35	4420
5. 8 - 55 - 00	216	159	17.58	17.70	94.10	6225	5858
	222	155	16.89	17.60	93.05	5944	5531
	239	149	15.82	17.70	93.60	5600	5242
	241	155	11.32	16.75	93.45	3792	3544
	254	162	12.32	17.35	92.40	4275	3950
	270	156	15.22	17.05	91.35	5191	4742
	275	165	10.28	16.20	93.95	3331	3129
	288	182	8.79	15.65	91.70	2752	2524
	297	172	13.39	17.55	91.15	4699	4283
	303	145	13.29	17.20	93.20	4570	4259
	Mean		160	13.49	17.08	92.80	4638
6. 8 - 1903 - 02	211	169	17.09	17.75	92.60	6067	5618
	225	169	16.69	18.00	94.15	6009	5657
	240	169	16.02	17.95	92.55	5752	5323
	242	179	13.18	18.00	93.40	4746	4433
	253	166	13.09	17.95	93.80	4699	4408
	268	176	11.16	17.65	93.35	3939	3677
	274	167	9.11	16.95	94.70	3089	2925
	286	168	7.26	15.60	93.30	2265	2113
	299	164	10.36	17.55	92.45	3636	3361
	307	164	15.53	16.95	92.70	5264	4880
	Mean		169	12.95	17.44	93.30	4947

<u>Variety Number</u>	<u>Plot No.</u>	<u>Heats Hary.</u>	<u>T. Heats Per A.</u>	<u>% Sugar.</u>	<u>App. Coef of Pur.</u>	<u>Lbs. Sug. per A.</u>	
						<u>Gross</u>	<u>Ind. Av.</u>
7. 8-1901-00	218	166	18.80	17.75	92.85	6675	6198
	224	174	19.25	17.85	92.20	6871	6335
	236	173	15.10	17.85	93.15	5391	5022
	247	164	14.01	17.55	94.55	4918	4650
	259	161	10.55	17.40	93.45	3671	3431
	265	174	13.42	17.10	92.50	4588	4244
	272	171	13.44	18.10	93.65	4865	4556
	283	172	9.19	16.26	93.20	2987	2784
	300	167	8.71	17.35	93.70	3023	2833
	301	133	12.52	17.00	91.45	4258	3894
	Mean		166	13.50	17.42	93.07	4725
8. U.S. 217	217	163	16.40	17.55	92.85	5757	5345
	230	169	17.09	17.20	92.95	5879	5465
	232	165	12.99	17.35	94.05	4507	4239
	245	160	12.80	17.40	93.20	4454	4151
	256	172	12.96	16.90	92.10	4380	4034
	263	171	11.59	17.05	92.85	3951	3669
	279	166	11.04	17.10	93.25	3774	3519
	284	176	8.03	16.00	95.05	2569	2442
	291	159	12.84	17.20	93.80	4418	4144
	308	160	12.26	16.55	92.60	4059	3759
	Mean		166	12.80	17.03	93.27	4375
9. Synthetic check	213	174	18.86	16.25	91.15	6130	5587
	227	172	16.75	17.55	92.10	5879	5415
	235	170	14.72	17.00	93.65	5006	4688
	246	172	13.25	16.80	93.75	4452	4174
	251	156	12.41	16.15	92.65	4008	3713
	264	166	12.76	15.90	91.15	4056	3697
	278	166	11.43	17.00	93.35	3888	3629
	290	169	9.21	15.40	91.80	2835	2603
	292	169	12.52	16.95	92.85	4243	3940
	309	165	15.96	16.20	94.00	5173	4863
	Mean		168	13.79	16.52	92.64	4567

<u>Variety Number</u>	<u>Plot No.</u>	<u>Beets Harv.</u>	<u>T. Beets Per A.</u>	<u>\$ Sucr.</u>	<u>App. Coef of Pur.</u>	<u>Lbs. Sug. per A.</u>	
						<u>Gross</u>	<u>Ind. Av.</u>
10. Local commercial	220	168	19.57	17.20	93.15	6733	6272
	223	169	20.12	17.25	91.75	6941	6368
	237	161	14.95	16.90	91.90	4933	4533
	248	165	14.39	16.85	94.05	4849	4560
	252	166	15.25	17.20	93.10	5245	4883
	266	166	12.98	16.05	92.65	4167	3861
	271	164	12.19	17.05	94.35	4157	3922
	289	165	8.02	15.65	93.55	2511	2349
	294	164	7.72	16.20	93.10	2503	2330
	305	163	14.43	16.30	93.65	4703	4404
	Mean		165	13.96	16.62	93.12	4674

AGRONOMIC TEST OF LEAF SPOT RESISTANT VARIETIES
FORT COLLINS, COLORADO, 1939

GENERAL SUMMARIES

Variety	T. Beets		ADD. Coef of Pur.	Lbs. Sug. Per A.		Beets Harv.
	Per A.	% SUG.		Gross	Ind. Av.	
U.S. 215	13.10	17.06	93.29	4175	4174	166
U.S. 200 x 215	13.03	17.16	92.52	4190	4147	167
8-1919-0	12.66	16.96	93.21	4310	4012	162
8-1913-00	12.90	17.08	93.35	4120	4129	166
8-55-00	13.49	17.08	92.80	4638	4306	160
8-1903-02	12.95	17.44	93.30	4547	4210	169
8-1901-00	13.50	17.42	93.07	4725	4395	166
U.S. 217	12.80	17.03	93.27	4375	4077	166
Synthetic check	13.79	16.52	92.64	4567	4231	168
Local Commercial	13.96	16.62	93.12	4674	4348	165
Mean	13.22	17.04	93.06	4522	4206	165
F	†	4.74**	1.19	†	†	1.99
Standard Error - mean.	.44	.134	.272	167.6	154.2	1.92
Standard Error - mean in % of the mean.	3.32	.79	.29	3.71	3.67	1.16
Twice S.E. of a Diff.	1.24	.38	.77	474	436	5.0

† Variance for varieties less than variance for error.

** F exceeds 1% point.

Discussion:

None of the differences in yield of either roots or sugar per acre approached statistical significance. The leaf-spot-resistant varieties had consistently higher percentage sucrose than that of the checks. The differences slightly exceeded the amount needed for statistical significance in all cases in comparison with Synthetic Check and in all except one case in comparison with the local variety. Of the leaf-spot-resistant varieties No. 7 was highest in yield of roots and second in sucrose percentage. This variety stands first in the test in sugar per acre; slightly exceeding the local variety in this respect.

STAND AND SPACING TEST

This test duplicated that of 1938. (See 1938 report for discussion) Only the four inside rows of each plot were harvested in 1939. The results of this test tend in general to confirm those of the previous two years. Differences in yield are relatively small for stands of about 70 to about 140 beets per 100 feet of row. As stands fall below about 70 beets per 100 feet of row yields tend to decline till at a stand of about 30 beets per 100 feet of row the yield is approximately two thirds that of the optimum stands. Very thin stands produce beets of lower sucrose percentage, but there appears to be a considerable range in the stand in which sucrose percentage varies only slightly. Plot and general summaries for 1939 and a general summary for 1937, 1938, and 1939 follow.