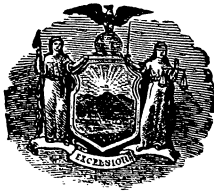


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VARIATIONS IN VARIETIES OF CANNING PEAS. II
F. H. HALL



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VARIATIONS IN VARIETIES OF CANNING PEAS. II

F. H. HALL

SUMMARY

In continuation of work carried on and reported in 1924, comparison studies were made of 51 varieties of peas known to be, or hoped to be, suitable for commercial canning. Of 15 of these varieties, seed was secured from two or more sources, so that the resemblances or differences between seedsmen's strains of these well-known canning peas could be observed and measured.

Weather of the season was very bad for peas, so that only half-crops were secured; but the studies made and the data secured confirmed the conclusion reached in 1924, that "strains" of canning peas of the same variety, as grown by, or for, different seedsmen, differ markedly in practically all characteristics that determine their value for canning. Apparently, only a few years of culture, selection, and "roguing" of a variety, according to any particular seedsman's idea of type, will develop what is practically a distinct pea, so far as canning characteristics are concerned, from that grown by another seedsman in the same or a different locality, but with another type-ideal in mind.

Conditions do not warrant very definite statements regarding the varieties tested for the first time in 1925, but the following ones are at least worth further study: Extra Early, Hustlers, Rice's No. 330, Velocity, Rogers' "12," Acme, Chelsea Rival, and Maincrop. In seasons adapted to good growth of peas Duke's Delight, Home Delight, Richard Seddon, Little Marvel, Lincoln, and Witham Wonder might also be considered. Conditions in 1925 prevented a fair study of these varieties; but all seemed above the average in productivity and with some characteristics of good canning peas.

PLAN AND CONDITIONS OF TEST

In 1924, about 30 comparison plats of canning peas were grown at this Station, and the results reported in Bulletin No. 526. The decided differences shown to exist between pea crops grown from seed of

the same variety obtained from different sources were noted with marked interest by many growers and canners of peas. This manifestation of interest and the knowledge that the tests of 1924 were not sufficiently comprehensive, led to a continuation and extension of the work in 1925. Similar plans were followed and the same conditions were sought by which fair comparisons could be obtained between varieties and "strains;" but 51 varieties were sown, instead of 20 as in 1924. Of these varieties 36 were of unknown value as canning peas, were little known as such, or were new kinds, still in the testing stage. Of each of these varieties seed from only one source was secured; but for the other varieties, those well known to canners, seed was obtained from two or more sources, including the introducer where possible. In case of two well-known varieties six "strains" were compared; so that, in all, 86 plats were sown, ranging in size from $1\frac{1}{4}$ to 5 square rods. In sampling, 4 square yards were taken from each plat if possible, located where the appearance of the vines indicated good average stand and growth for the variety or strain. The smooth-seeded varieties, with Surprise, were sown on April 14, and the wrinkled-seeded kinds ten days later.

SOIL AND WEATHER

The ground used for the trials of 1925 was the same as that used in 1924, with an added adjacent section, of soil of the same type and uniformity, to provide for the increased number of varieties and strains included. The stoppage of a lateral drain at one side of the area selected, joined with weather which imperatively demanded proper drainage, made the soil of a few plats at that side of the field very difficult to work properly for seeding, and kept it cold and soggy during early growth, followed by untoward conditions in the drought and hot weather later. Consequently, growth of the peas on these plats was too poor to justify including data from them in these tables. However, only one prominent canning variety was affected, Perfection, the others being mainly English varieties imported for comparison.¹

¹Selection of the English varieties was left largely to several leading pea growers and pea breeders in England, after an outline had been given them of the special characteristics required in America for a canning pea. Owing to the long season during which peas can be sown in England, and the ease and perfection with which table peas can be grown in the English climate, that country has no pea-canning industry; and the ideas of growers and breeders as to types suitable for American canneries are, apparently, poorly based. Most of the varieties sent, even when they grew as well as American canning types, were lacking in one or

Contrary to the experience in 1924, when admirable climatic conditions succeeded very poor weather previous to sowing and resulted in a splendid crop, the conditions grew worse rather than better after the peas were sown in 1925. A long period of cold weather seriously affected the germination of the peas, even the smooth-seeded ones, and retarded early growth. A short period of normal weather was followed by extreme heat and drought which checked the development of the vines, induced early blossoming, shortened the period of bloom, and later ripened the crops prematurely and rapidly. Growers, generally, about Geneva reported half crops or less; and the same conditions prevailed to a marked extent on the Station plats. The vines of the smooth-seeded varieties, which felt the full effect of the early-season retardation, weighed decidedly less than half as much as those of the same varieties grown in 1924, but the yield of peas was somewhat more than half that of 1924. With the later-maturing, sweet wrinkled sorts, the vine yield was rather more than half that of 1924, and the yield of peas just about half.

GENERAL RESULTS

These abnormal weather conditions made the result of the 1925 trials very unsatisfactory; but it is believed that the comparisons are of value. The strains of any variety were grown under uniform conditions and should have suffered alike from the vicissitudes of the weather. At any rate, the differences between strains were marked in 1925 as in 1924, in many cases where they were checked were in the same directions as in 1924, and various characteristics were usually so correlated as to indicate that the growers or selectors of the strains were guided by different ideals in their stock selections.

As in 1924, the data were secured by hand cutting of the vines on definite areas, actually counting the vines and pods, weighing of both, and of the peas, on accurate scales, sifting the peas by hand thru circular-perforation sieves, accurately made by drilling holes in metal pans, and counting 2, or more, ounce samples of the peas. In 1925, owing to lack of time from premature and "bunched" ripening of the increased number of varieties and strains grown, counts of the peas by grades were not made.

more characteristics necessary to make them good canning peas. Others of these varieties, even when grown adjacent to domestic types that did as well as the weather permitted, grew very poorly.

In case of many of the varieties, germination and growth did not permit regular fixed-area sampling; but where possible, from 100 to 300 vines were selected from sections of the plat where growth appeared most nearly normal. Only partial data can be given in the tables for these varieties.

Tables 1 and 2 correspond to similarly numbered tables in Bulletin No. 526 which show the results for 1924.

NOTES ON VARIETIES

As the weather conditions were so unfavorable to peas, it is thought inadvisable, at this time, to call special attention to differences between particular strains or varieties, or to give descriptions of varieties tested for the first time. For the information of those interested or for other experimenters along these lines, the following very brief notes are given concerning a few varieties which appear to merit consideration.

Extra Early, a selected strain of the well-known cream-seeded smooth pea, gives a product comparable with Alaska when cut at the right stage. Hustlers, a Wisconsin Station introduction, Velocity, an English pea, and Rice's No. 330 are all of the Alaska type, but the last two appear to be decidedly later. The Alaska on Plat 3 was from seed grown in Alaska and appeared to grade somewhat better than most of the other Alaska strains. Horal again gave a heavy yield, but probably because of the poor weather conditions, as explained later, did not grade as well as in 1924, nor quite as well as Winner, with which it must be compared for canners' use, tho later. It outyielded all Winner strains and gave better returns on a grade-price basis than two of the three strains. Rogers' "12," a late pea of Horal and Winner type seed, and tall Alaska-like vine, was the heaviest yielder of any of the smooth or semi-wrinkled starchy peas. No test was made of its canning quality. Of the newer "sweet wrinkled" peas, Acme, another Wisconsin Station pea, Chelsea Rival, from England, and Maincrop, from Michigan, succeeded well enough in the poor season of 1925 to justify recommending them for trial. The yields and other characters of several other varieties of which only vine samples could be taken would indicate that under favorable weather conditions these also might be worth testing. Among the best of these are Duke's Delight, Home Delight, Lincoln, Little Marvel, Richard Seddon, and Witham Wonder, each of which, on smaller vines, gave larger yields per vine than Advancer or Hors-

ford's Market Garden to which they correspond in general canning qualities.

SEASONAL VARIATIONS IN GRADE

The slow and poor germination of the peas, due to unfavorable conditions after sowing, with the consequent decrease in the number of vines per acre giving increased feeding area for the individual vines, and the checking of bloom by drought resulting in fewer pods per vine and fewer peas per pod, so increased the size of the peas in the smooth-seeded varieties, in Surprise, in Horal, and in Badger, that very decided changes in grade percentages were shown from those obtained in 1924, when the pea season, tho late, was normal so far as development of vines, pods, and peas was concerned.

With the smooth-seeded varieties and with Horal, the changes in grade reversed the advantage for sale by grade shown in 1924 to an even more decided advantage for sale by gross weight in 1925. With Badger, the 80 per cent gain for sale by grade in 1924 changed to a 20 per cent gain for sale by gross weight in 1925. With Surprise, as in 1924, the differences in grade between strains were sufficiently great so that the advantage in some cases would be for sale on grade basis and in other cases on gross weight basis.

All of the Admiral strains in 1924 so graded that the advantage was with sale by grade price, altho the amount of difference varied greatly; but in 1925 half of the strains showed larger returns from sale on the gross weight basis, altho the advantage for all the strains grouped as one variety was with the grade price returns as in 1924.

With the larger wrinkled peas, half of the varieties or strains grown in 1924 would have sold for better prices by each of the two methods; in 1925, three times as many strains would have brought better returns on the total weight basis than by the grade-price basis.

GENERAL CONCLUSIONS

Altho weather conditions greatly lessened the crop of all varieties and strains studied in 1925, it is believed that the data secured confirm the conclusion drawn from the work of 1924, that the strain of canning pea selected is, in case of most of the leading varieties, as vital a factor in determining the suitability for canning of the peas harvested and the financial returns to the grower as the variety itself. Climatic influences so shift the variations in characteristics, grading, etc., that only repeated and careful testing will determine the final relative desirability of the various strains.

TABLE 2.—DETAILED DATA OF CROP WEIGHTS, NUMBERS AND RELATIONSHIPS OF VINES, PODS, AND PEAS, AND WEIGHTS OF CLASSIFIED REFUSE FROM STRAINS OF CANNING PEAS GROWN IN 1925.

VARIETY	PLAT NO.	TOTAL YIELD PER ACRE	NO. VINES PER ACRE	NO. PODS PER VINE		NO. PEAS PER POD	WEIGHT OF USABLE PODS	WEIGHT OF USABLE PEAS	RATIO PEAS TO PODS	GREEN PEAS PER OUNCE	DRY SEEDS PER OUNCE	WEIGHTS OF REFUSE MATERIALS:				
				Good	Total							Haulms (vines)	Poor pods	Shells	Trash	Total
Alaska.....	1A	Tons-lbs. 4-1,075	451,330	2.17	2.41	3.08	5,105	2,174	1.23	86	138	1-1,932	38	2,969	19	2-1,802
Alaska.....	1B	3-1,713	451,330	1.71	2.54	3.25	4,397	1,910	2.30	82	123	1-1,316	38	2,439	9	2-1,802
Alaska.....	2A	4-1,680	468,270	2.27	3.30	2.99	5,527	2,401	2.30	85	133	2-1,531	19	3,107	19	3-1,298
Alaska.....	2B	4-16	408,980	2.21	2.42	2.99	3,667	1,854	1.99	88	133	1,757	208	1,757	57	3-1,553
Alaska.....	3	4-1,831	427,130	2.55	2.27	3.07	5,218	2,250	2.32	91	133	2-329	274	2,930	38	3-1,581
Alaska.....	4A	4-470	388,410	2.11	0.09	2.30	3,781	1,730	2.18	93	137	2-651	38	2,031	10	3-750
Alaska.....	4B	4-1,727	481,580	2.35	0.03	3.02	5,672	2,338	2.43	91	137	2-36	19	3,381	19	3-1,392
Eclipse.....	4C			3.97	0.08	2.43			2.19	80	137					
Extra Early.....	4D	4-924	429,550	2.28	0.08	2.37	4,991	2,193	2.27	85	130	1-1,820	113	2,760	38	3-731
Russet.....	5A	4-1,526	405,350	3.13	0.06	3.19	5,073	2,106	2.34	70	149	2-421	38	4,867	29	3-1,346
Late Alaska.....	5B	7-1,125	434,980	2.89	0.13	3.02	3,777	3,500	2.11	77	185	3-1,951	38	5,553	57	5-1,322
Nonpareil.....	6A	4-1,075	476,740	2.04	0.02	2.96	4,802	2,222	2.16	77	151	1-1,916	10	5,571	10	2-1,947
Velocity Impr'v'd.....	6B	4-1,075	467,060	2.35	0.04	2.39	5,218	2,505	2.08	78	167	1-1,819	38	2,703	10	2-570
Rice's No. 330.....	6C	3-1,260	417,450	3.00	0.04	3.04	2,430	2,430	1.99	80	155	1-1,288	151	2,382	10	2-831
Rice's No. 330.....	6D	4-440	473,110	2.70	0.01	2.71	2,822	4,954	2.401	2.06	93	1-1,456	10	2,534	10	3-20
Rice's No. 330.....	7C	3-1,865	427,130	2.45	0.06	2.51	2,651	2,146	2.17	98	161	1-1,176	38	2,496	10	2-1,720
Record Breaker.....	7A	3-1,865	333,960	2.70	0.04	2.74	4,462	2,109	2.11	50	103	1-1,393	10	2,345	10	2-1,737
Superb.....	7B			2.17	0.02	2.19	3,650		1.92	41	86					
Telegraph Imp.....	120	5-1,798	206,910	1.80	0.15	1.95	4,116	6,050	2.46	43	83	2-635	113	573	10	4-1,331
Winner.....	8A	4-168	644,930	2.23	0.01	2.24	4,538	2,307	1.97	105	182	1-1,620	10	2,194	38	2-1,862
Winner.....	8B	3-1,279	619,320	2.19	0.08	2.37	3,052	2,429	1.99	111	179	1-401	57	2,382	10	2-850
Winner.....	9A	3-635	396,380	2.14	0.08	2.22	3,460	1,787	1.94	110	217	1-1,157	38	1,645	38	2-878
Horra.....	9B	7-1,730	516,670	2.35	0.37	2.72	3,045	3,327	2.42	88	203	3-1,307	378	1,645	57	6-403
"12" (Rogers).....	9C	6-251	323,070	4.19	0.18	4.37	3,666	3,583	2.25	81	144	1-555	113	4,764	10	4-442
Surprise.....	9D	3-1,563	332,750	2.48	0.09	2.57	4,273	2,165	1.97	68	137	1-1,252	38	2,099	10	2-1,399
Surprise.....	10A	3-1,260	352,110	2.33	0.03	2.36	4,367	2,059	2.12	69	142	1-872	19	2,287	19	2-1,197
Surprise.....	10B	3-1,260	342,940	1.15	0.13	2.28	3,375	1,797	2.16	67	134	1-328	57	2,041	38	2-1,464
Surprise.....	11A	3-353	379,940	1.71	0.44	2.15	3,592	1,458	2.46	76	155	1-439	322	2,117	19	2-897
Eclipse.....	11B	7-1,563	324,280	2.08	0.29	2.37	3,592	1,419	2.53	78	139	1-1,801	170	2,127	47	3-145
Badger.....	12A	7-520	497,310	2.34	0.12	2.46	3,799	3,602	2.46	78	172	3-996	132	5,048	6	6-233
Green Admiral.....	12B	7-520	533,610	2.15	0.10	2.25	4,811	4,434	1.94	80	158	2-1,814	113	4,131	29	7-549
Green Admiral.....	12C	8-1,310	462,220	2.36	0.50	2.86	3,542	7,203	2.40	80	166	4-1,831	511	4,178	29	5-982
Green Admiral.....	13A	6-1,310	491,260	1.96	0.18	2.14	4,223	3,328	2.00	76	123	3-456	161	3,328	38	4-1,945
Green Admiral.....	13B	6-1,613	542,080	1.75	0.15	1.90	4,011	2,968	2.22	79	168	3-844	189	3,574	38	5-682
Green Admiral.....	14A	7-1,730	439,280	2.27	0.23	2.50	5,334	4,320	1.94	75	168	3-1,138	198	4,046	29	5-1,611
Green Admiral.....	14B	7-520	517,880	1.64	0.53	2.17	4,229	5,974	2.23	86	155	3-1,382	198	3,308	5	5-1,854
White Admiral.....	15A	8-940	549,340	1.50	0.48	1.98	3,827	5,729	2.35	81	172	5-379	832	3,291	19	7-502
Yellow Admiral.....	15B	8-335	514,250	1.70	0.29	1.99	4,886	3,225	2.33	81	169	4-376	397	4,310	38	6-1,111

Abundance.....	16A	609,840	1.23	0.54	1.77	1.82	1,154	4.55	79	140	3-542	964	5,102	19	5-1,546
Acme.....	16B	349,690	2.24	0.17	2.41	3.49	2,174	2.58	78	135	3-448	359	3,402	19	5-228
Advancer.....	6-705	403,330	1.75	0.50	2.25	4.08	5,993	2,22	66	139	3-126	586	3,290	19	5-1,571
Advancer.....	7-1,730	430,760	2.17	0.21	2.38	4.44	4,159	2.15	62	139	3-560	246	4,746	19	5-1,571
Advancer.....	18A	433,180	2.09	0.25	2.34	4.02	8,546	3,29	60	131	3-1,714	378	4,765	57	6-915
Advancer.....	7-218	415,030	2.60	0.32	2.92	3.24	7,147	2.16	65	140	3-806	265	3,782	57	5-910
Allan's Canner.....	7-1,125	429,550	1.44	0.22	1.66	4.99	5,653	1.79	60	151	4-1,018	454	2,439	57	5-1,968
Best of All ¹	19B	—	4.06	0.14	4.20	2.28	—	2.59	36	82	—	—	—	—	—
Chelsea River.....	6-1,310	369,050	2.09	0.49	2.58	2.93	7,443	3,118	66	139	2-1,735	132	4,286	38	5-192
Canners' Gem.....	5-1,798	431,970	1.84	0.26	2.10	3.40	5,672	2,307	73	121	2-1,748	378	3,328	38	4-1,492
Canners' Gem.....	20B	454,960	2.00	0.37	2.37	3.40	6,220	2,996	66	160	3-107	378	3,195	29	4-1,709
Gem.....	21A	4-1,378	395,670	1.97	0.19	2.16	3.07	4,689	58	125	2-500	189	2,118	10	3-817
Premium Gem ⁴	21B	4-1,075	398,090	0.96	1.43	2.42	2,497	1,040	82	125	2-876	1,702	1,438	19	4-35
Little Gem.....	5-890	343,640	2.46	0.57	3.03	3.35	5,143	2,032	60	117	2-839	908	3,101	10	4-858
Duke's Delights ¹	22B	—	2.71	0.14	2.85	3.95	—	—	53	122	—	—	—	—	—
Home Delights ¹	22C	—	2.41	0.06	2.47	5.07	—	—	60	143	—	—	—	—	—
Horsford's M. G.....	7-823	389,620	2.29	0.19	2.48	3.62	6,957	3,064	65	125	3-1,469	397	3,856	38	5-1,760
Horsford's M. G.....	23B	352,110	2.74	0.36	3.10	3.26	8,451	3,422	58	124	3-1,847	340	5,010	19	6-1,206
Horsford's M. G.....	7-1,125	303,710	3.51	0.34	3.85	3.29	7,903	3,554	61	123	3-976	246	4,311	38	5-1,571
Horsford's M. G.....	24A	9-755	294,030	3.61	1.00	4.61	3,01	3,006	66	132	4-735	870	6,125	19	7-1,749
Horsford's M. G.....	6-1,613	312,180	2.65	0.42	3.07	2.90	5,577	2,439	61	139	3-1,678	358	3,119	19	5-1,174
Horsford's M. G.....	25A	9-1,965	388,410	2.37	0.25	2.62	4.50	8,584	72	129	5-776	605	4,992	28	8-401
Kelveton Wonder ¹	26C	—	2.23	0.31	2.54	2.64	—	2.42	59	120	—	—	—	—	—
Lincolnt ¹	26C	—	2.36	0.41	2.74	2.19	—	2.61	62	150	—	—	—	—	—
Little Marvel ¹	26B	—	2.36	0.37	2.73	3.24	—	2.24	40	108	—	—	—	—	—
Little Marvel Imp ¹	25C	—	2.51	0.00	2.51	3.23	—	2.09	45	145	—	—	—	—	—
Maincrop.....	8-1,545	370,260	2.62	0.44	3.06	3.55	8,016	3,147	68	150	4-962	567	4,840	29	7-398
Peter Pan ¹	27C	—	1.79	0.08	1.87	2.57	—	—	40	104	—	—	—	—	—
Pioneer ¹	27D	—	1.22	0.02	1.24	2.50	—	—	36	124	—	—	—	—	—
Perfection.....	28B	100	458,590	1.83	0.17	2.00	3.63	6,542	67	139	2-1,331	227	3,706	19	4-1,283
President.....	5-588	323,070	1.30	0.63	1.93	3.23	3,847	1,538	55	109	2-1,643	1,068	2,299	10	4-1,050
Prince of Wales.....	7-1,428	350,900	2.50	0.09	2.59	2.81	6,542	4,160	37	94	4-791	93	2,364	18	5-1,268
Prince of Wales.....	30A	341,220	2.19	0.19	2.38	3.18	8,773	3,620	41	95	3-1,411	151	5,143	10	6-715
Prince of Wales.....	31A	9-755	350,900	3.01	0.16	3.17	4,04	10,777	54	88	3-1,865	113	5,824	19	6-1,811
Rice's No. 13.....	31B	6-705	363,000	1.37	0.18	1.55	3.75	5,974	2,23	57	3-551	170	3,280	19	5-20
Rice's No. 13.....	32A	8-1,848	458,590	1.79	0.35	2.14	4.31	8,205	61	153	4-132	511	4,405	38	7-86
Rice's No. 13.....	33A	8-940	406,561	2.19	0.23	2.42	4.05	3,763	65	136	4-954	274	4,235	38	6-1,499
Richard Seddon ²	31C	—	2.65	0.12	2.65	3.44	—	—	48	123	—	—	—	—	—
Senator.....	3-1,865	344,650	1.34	0.24	1.58	2.81	4,348	1,880	43	123	1-1,101	410	2,457	10	2-1,984
Witham Wonder ¹	33B	—	2.06	0.21	2.27	4.37	—	2.11	62	137	—	—	—	—	—

¹Plat too uneven for full sampling—100 vines taken where growth seemed normal. An English smooth pea.

²Sample 100 vines only.

³Wrinkled variety similar to, if not identical with, Surprise.

⁴Harvested too early.

⁵Sample 200 vines only.

⁶Sample 300 vines only.