KENTUCKY

AGRICULTURAL EXPERIMENT STATION

OF THE

STATE COLLEGE OF KENTUCKY.

BULLETIN No. 50.

I. FRUIT GROWING IN KENTUCKY.
II. NOTES UPON VEGETABLES.

LEXINGTON, KENTUCKY
APRIL, 1894.

KENTUCKY

Agricultural Experiment Station

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Correspondents will please notify the Director of changes in their post-office address, or of any failure to receive the bulletins.

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KENTUCKY AGRICULTURAL EXPERIMENT STATION,
LEXINGTON, KY.

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BULLETIN NO. 50.

I. FRUIT GROWING IN KENTUCKY.

By C. W. Mathews, Horticulturist.

During the fall and early winter of 1893 an effort was made to obtain through the farmers of the State a better understanding of the actual condition of the fruit-growing industry in Kentucky.

Circulars of inquiry relative to the extent of fruit culture, the most profitable varieties, the most injurious insect and fungous enemies, and other conditions of fruit growing, were sent to several hundred of the leading fruit growers of the State, including all whose names and addresses could be obtained from the county officers and from other sources. Some of these officers failed to respond to our request for names of fruit growers in their respective counties, so that a number of counties were wholly unrepresented in the replies, but as these sections are for the most part among those which give but very little attention to fruit growing, it is believed that the information obtained from the remaining counties gives us a fairly comprehensive view of the present condition of this industry in the State.

While these inquiries were sent out primarily to inform ourselves upon the conditions and requirements of fruit growers, in order to enable us to make the horticultural work of the Station of more value to them, the replies

have seemed of such general interest, representing as they do the opinions and observations of the best cultivators in all parts of the State, that a portion of the information thus obtained is published in the hope that it may prove of some use to the established fruit growers, and perhaps encourage others to undertake fruit culture who have made but little effort in this direction.

This State probably cannot as yet lay claim to being one of the great fruit producing States of the Union, as the attention of its cultivators has been more largely given to other crops; but the success which is attending the efforts of some of its fruit growers may well lead us to question if Kentucky may not obtain an enviable distinction in this respect when proper attention is given to fruit culture.

Complaint is often made that fruit growing cannot be successful in this State owing to the changeable climate and late spring frosts This drawback, it must be admitted, is not wholly imaginary; but at the same time there is but little doubt that this difficulty has been so greatly magnified as to deter many farmers from undertaking the cultivation of orchards for profit, and many others from producing an abundance of the most delic ious and healthful kind of food for their own families.

These climatic conditions, moreover, are only such as are found to prevail to a greater or less extent over a large portion of the neighboring States; yet some of these States, notably Illinois, Indiana, and Ohio, are taking front rank among the fruit producing sections of the eastern United States.

But to turn to what is of much greater significance to us; our nearly two hundred correspondents in Kentucky affirm by a large majority, as a result of their observation and experience, that the soil and climate of this State also, are favorable to fruit culture. Of those who

made a definite reply to an inquiry upon this subject, 85 per cent. gave a distinctly affirmative answer.

A second inquiry, the replies to which are of still further encouragement, was the following: "Are orchards more or less profitable than other crops in your vicinity?" 36 per cent. of the entire number of correspondents or 54 per cent. of those giving unconditional answers, reply that they are more profitable than other crops, while many others admit that they are profitable when properly cared for.

At first glance the latter report may appear to make a rather unfavorable showing, but it is to be remembered that many counties of the State have no local market, and many even have no railroad as a means of shipping to the large markets, so that while 85 per cent. of our correspondents treating of these subjects can produce fruit with a good degree of success, only two-thirds of that number are so situated as to make its cultivation for market profitable.

The fact that 36 per cent. of the fruit growers corresponded with, are able to produce orchard fruits with greater profit than other crops, seems to prove conclusively, that in most parts of the State, at least, the difficulties due to climatic influences are not so great that good judgment combined with good care and cultivation cannot readily overcome them.

It would seem, therefore, that with such evidences of the practicability of raising fruit in this State, every farmer ought to be supplied from his own farm with an abundance of fruit for his own household, at least, and it is undoubtedly true that upon a carefnl examination of the conditions prevailing in their own neighborhoods, many would find an opportunity for the growing of profitable crops for market also.

The replies to our inquiries, however, show that in

comparatively few of the counties heard from do even three-fourths of the farmers produce orchard fruits sufficient for their own use; and in not a few cases our correspondents report that not one in twenty of the farmers in their vicinity raise enough of these fruits for a family supply.

Concerning small fruits, it seems evident that not one in thirty of the farmers of the State supply their own tables even with strawberries, the most easily grown of them all.

These facts ought not be true in a State so well adapted to fruit growing as Kentucky, and farmers who neglect to raise these fruits for their own families miss one of their highest privileges.

In regard to the relative profits in different orchard fruits, apples naturally take the lead, 65 per cent. of our correspondents finding them the most profitable fruit, while 30 per cent. obtain a greater profit in peaches.

That this result is largely a matter of locality is shown by the fact that in the counties adjacent to the Ohio river, and the large markets of Louisville and Cincinnati, which are most favorably situated for growing and marketing peaches, this fruit is found by more than two-thirds of the growers heard from, to be more profitable than apples. In all other portions of the State, however, the apple is uniformly pronounced to be the most profitable orchard crop grown.

Treatment of Orchards.

In the treatment of apple orchards, widely varying practices are followed, some growing corn, tobacco, potatoes, wheat, or oats, while others pasture their orchards with hogs, sheep or other farm stock.

As a general rule any crop which requires cultivation during the first portion of the season, is far preferable to

any grain crop, and especially is this true in newly planted orchards. In either case, the soil, if not already fertile, should be liberally treated with manure or fertilizer so that the trees may not be robbed of their necessary support. In other words, if two crops are to be grown together upon the same ground, plant food for two crops must be at hand, or one or both crops will suffer.

In mature orchards, pasturing with hogs or sheep is a practice which gives almost universally good results. By this plan at least two important objects are attained; the fertility of the soil is kept up to a considerably degree by the droppings of the animals, and most of the imperfect and wormy fruit is eaten as soon as dropped, thus preventing the escape and development of the various larvæ, and the consequent re-infesting of the tree.

Varieties of Apples for Kentucky.

In response to our request to name the best apples for their several localities, our correspondents give a long list of varieties both for market and for home use, although comparatively few varieties are very generally named. These varieties, moreover, appear to be the favorites over all parts of the State, and those who plant orchards from this list, which has been shown by the experience of Kentucky fruit-growers to be adapted to our conditions, cannot go far wrong in their selection.

Among apples recommended for a succession for home use the following varieties lead:

Name of Variety.	Season of Maturity.	No. Times Named
Early Harvest	Summer	83
Wine Sap	Winter	62
Ben Davis	Winter	52
Rome Beauty	Winter	45
Maiden's Blush	Late Summer	33
Rawle's Janet	Winter	25
Red June	Summer	17
Summer Pearmain	Summer	16
Rambo	Autumn	14
Fall Queen	Autumn	13

While forty-seven other varieties of apples are named as favorites for home use, many of which are undoubtedly as good or better in quality than some of those named above, especially under certain conditions of soil and cultivation, this list will probably meet the average conditions of cultivation in Kentucky as well as any that could be named.

A still longer list of apples is mentioned as desirable for market, although the number of varieties named by a large number of individuals is more restricted than in the case of varieties far home use, and justly so. A very few standard varieties adapted to the soil and market will nearly always be more satisfactory and more profitable than a larger number of less widely known varieties.

List of Favorite Market Apples.

Name of Variety.	Season of Maturity.	No. Times Named.
Ben Davis	Winter	83
Wine Sap	Winter	65
Rome Beauty	Winter	55
Rawle's Janet	Winter	23
Early Harvest	Summer	21
Maiden's Blush	Late Summer	19
Limber Twig	Winter	11
Fall Queen	Autumn	8
Smith's Cider	Winter	7

It will be observed that while the two lists of varieties are similar, there is quite a striking difference in the relative order of their popularity in the two cases, these differences showing clearly the different objects which should be aimed at in selecting varieties: namely, for home use a selection which can furnish a constant supply of apples from mid-summer to spring of the succeeding season, and for sale such varieties only as are adapted to the available markets, a rule which in the majority of cases will call for winter fruit. Early apples, while often very profitable under certain conditions, including a near and ready market, cannot be cultivated for profit by the majority of farmers, especially if at considerable distance from market and with limited facilities for transportation.

The experience of the apple growers of this State at once confirm this. In the list of nine market apples given above, the winter varieties are mentioned as favorites two hundred and forty-four times as against early varieties forty-eight times. On the other hand, the most popular ten varieties for home use have winter apples named one hundred and eighty-four times to summer and autumn varieties one hundred and seventy-six times.

Insect Enemies of the Apple.

The most injurious insects in Kentucky apple orchards, according to the experience of our correspondents are the codling-moth, tent caterpillar, borer, curculio, and aphis or plant louse, and in the order named.

Until recent years orchardists have been almost helpless against the invasions of the first of these, the codling-moth, the larvæ of which are the main cause of "wormy apples." Experiments by the Entomologists of this and other stations, however, have shown conclusive-

ly that a large part of this injury can be prevented by the use of arsenical poisons applied with spraying pumps.

In Bulletin No. 40, of this Station, Prof. Garman, Entomologist, has treated of this with several other insect pests, but unfortunately this bulletin is now out of print. I therefore quote the following from his suggestions for combating this insect:

"Most of the fruit ordinarily lost from codling-moth depredations can be saved by spraying the trees in spring with London purple or Paris green in water, employing for the purpose a force pump and spray nozzle connected with a barrel holding the mixture, and using one pound of either poison to from 160 to 200 gallons of water. The spraying must be done immediately after the petals fall from the blossoms, and this may be followed by a second application in a week or ten days. On no account should the spraying be done before the petals have fallen; and it should not be delayed long after they are down, for the reason that it is not possible to reach the worms with any application after they have entered the fruit. With a pump such as is made for the purpose by the Nixon Nozzle and Machine Company, of Dayton, Ohio, an apple tree of large size can be sprayed in from one to two minutes."

As a safeguard against the larvæ of a second brood of moths, Prof. Garman suggests that apple trees be sprayed again with Paris green not earlier than July 1st.

The most common and one of the simplest methods of treating the tent caterpillar, and the plan successfully followed by many of our correspondents, is that of destroying the young caterpillars, in the morning or at night, while within their nests in the tree, either by hand or by means of a torch at the end of a pole. The latter method is somewhat objectionable, as in the effort to eradicate the insect pest, the branch is liable to be injured or even killed by the torch. A careful examination of an apple orchard in winter will usually reveal the eggs of this insect glued on a band around the smaller twigs, and if these are cut off and burned, much trouble

will be avoided later in the season. This pest is also readily destroyed by the Paris green spray recommended for the codling-moth, so that the two enemies can be fought together.

For the borer, cutting out is the remedy most practiced and on the whole probably the most effectual yet discovered. For the two remaining insect pests of which Kentucky orchardists complain, the curculio and aphis, entomologists appear not to be fully agreed as yet upon a satisfactory remedy. One correspondent reports excellent results from the use of London purple in combating the curculio, and further experiments upon the subject will be desirable.

Fungous Diseases of the Apple.

Many apple growers are finding the diseases known as apple rot and apple scab to be the most destructive pests in their orchards. Of the two the rot appears most injurious. It is needless to enter into a discussion of the treatment of these diseases here, as they have been fully treated by Professor Garman in Bulletin 44 of this Station which, if not already received, can be obtained upon application.

The experiments conducted at this and other Stations upon the spraying of orchards as a remedy for fungous and insect pests, together with the adoption of this practice by many of the best cultivators of these fruits, has shown conclusively that the injuries resulting from these pests can to a great extent be overcome. While it involves considerable extra labor in the care of an orchard, it is labor that is well repaid in the increased value of the fruit obtained. With the additional labor and expense incurred in spraying, it becomes more than ever necessary that no orchards should be planted upon a

more extensive scale than can be thoroughly cared for. There is but little pleasure or profit to be obtained from large orchards which are left to take care of themselves.

Peach Orchards in Kentucky.

As was stated in the general discussion of Kentucky fruits, peaches are cultivated extensively only in limited portions of the State; mainly in the counties adjacent to the Ohio river and especially those conveniently located with reference to the markets of Louisville and Cincinnati, some of the orchards in these counties being very large and covering many acres of ground.

This fruit is produced quite generally, however, in a small way for home use throughout the State among those who cultivate fruit at all. The favorite varieties among the large Kentucky growers with whom we have corresponded, are the following, in the order named. Old Mixon (whether free or cling not always stated), Crawford Early, Crawford Late, Smock, Heath Cling, Stump the World, and Mountain Rose.

But little definite information has been obtained regarding the extent of the insects and diseases of peaches in Kentucky. The borer appears everywhere present, and the general treatment is to cut out and destroy with the knife. The Curculio is also reported as doing great injury, but a thoroughly practicable and efficient treatment has not yet been determined upon, either by entomologists or practical growers. Some of our correspondents report having used Paris green in a dilute form, (about 1 ounce to 20 gallons of water) with excellent results, while others report no results whatever from the same treatment.

Pears and *Plums* appear to be cultivated only to a comparatively limited extent in Kentucky. Among pears the favorite varieties appear to be;—

Bartlett	named	58	times.
Keiffer	"	34	"
Seckel	"	16	"
Duchess d'Angouleme	"	9	"
Flemish Beauty	"	9	"
Le Conte	"	7	"

Grapes and Small Fruits.

The small fruits are not given the attention on our farms that their value merits, and the only fruits of this class upon which we have obtained sufficient data to be of any service are grapes and strawberries.

The grape seems to be more generally cultivated than any other, but even this easily grown fruit is not enjoyed by nearly all the farmers of the State. Those who have grown them have been most successful with the following ten varieties.

Concord	named	118	times.
Catawba	"	36	"
Ives' Seedling	"	33	"
Delaware	"	25	"
Niagara	"	22	"
Martha	"	13	"
Moore's Early	"	11	"
Pocklington	"	11	"
Brighton	"	10	"
Worden	"	8	"

While the list does not of course include all the varieties of grapes that may be grown in Kentucky, it certainly does represent those which have stood the test of experience among many cultivators, and a selection rom this list can be relied upon to give satisfactory results.

About fifty varieties of grapes were planted upon the Station farm last spring—1893—and a considerable number in addition will be set out during this season. It is proposed to make a thorough trial of these and the newer grapes as they are introduced, and also to test the comparative value of various methods of pruning and training. A full report will be made upon these and other topics connected with grape culture as soon as practicable.

With strawberries, as with grapes, but little definite information could be obtained in response to our inquiries, the reason apparently being, that except in the vicinity of the large cities they are sparingly cultivated.

The following table indicates the relative order of excellence for general purposes, in the estimation of Kentucky growers:

ABBREVIATIONS: P., Pistillate or imperfect flowered; B., Bisexual or perfect flowered.

VARIETY.	Sex.	No. Times Named.
Crescent	P	41
Bubach	P	27
Haverland	P	21
Gandy	B	20
Kentucky	B	20
Sharpless	B	15
Wilson	B	12
Jessie	B	8
Chas. Downing	B	8

Somewhat to our surprise the Crescent surpasses every other variety in the favorable estimation in which it is held by the growers with whom we have corresponded. This conclusion must be due chiefly to its vigor, productiveness and firmness for shipping purposes; in

quality it is surpassed by most of the other varieties mentioned. The Bubach, in the small plots under trial at the Station grounds, was the most satisfactory variety grown, ripening among the first, and being of large size, very productive, and of good quality.

Strawberry growers who produce only the Crescent should make a trial of the three following varieties in this list, Bubach, Haverland, and Gandy. Bubach and Haverland however, are both pistillate or imperfect flowered and to insure fertilization, some perfect flowered variety, such as the Gandy, must be grown near them.

The character of soil and season was rather unfavorable to a good crop of strawberries upon the Station grounds the past season, and owing to depredations during the season of ripe fruit, it has been impossible to make more than an approximate estimate of the productiveness of the varieties tested. As this kind of work has now been transferred to the Experiment farm somewhat outside of the city, it is hoped that this source of annoyance and error will be eliminated in the future.

ABBREVIATIONS: B., Bisexual or perfect flowered; P., Pistillate or imperfect flowered; L., Large; M., Medium; S., Small.

VARIETY.	Sex	First Flowers.	First Ripe Fruit.	Productiveness Scale 0-10	SIZE.
Auburn	P.	Apr. 27.	May 27.	8	M. to L.
Beverly	B.	Apr. 24.	Jnne 3.	7	M.
Boynton	P.	Apr. 14.	May 25.	5	M. to S.
Bubach	P.	Apr 24.	May 30.	10	L.
Crawford	B.	Apr 14.	May 27.	7	M. to L.
Cumberland	B.	Apr. 24.	May 27.	7	M. to L.
Dayton	B.	Apr. 24.	May 27.	8	M.
E. P. Roe	B.	May 1.	June 6.	4	M.
Gandy	B.	Apr. 27.	June 3	8	L.
Gillespie	B	Apr. 14.	June 3.	6	M.
Gov. Hoard	B.	Apr. 14.	June 3.	5	L.
Jessie	B.	Apr. 14.	May 30.	8	M. to L.
Leader	B.	Apr. 14.	June 5.	7	M. to L.
Maple City	B.	Apr. 27.	June 3.	8	M. to L.
Martha	P.	Apr. 27.	May 30.	5	S.
Middlefield	P.	Apr. 24.	June 3.	5	M
Muskingum	B.	Apr. 27.	May 30	6	M. to L.
Ohio	P.	Apr. 27.	June 3.	7	M.
Princess	P.	Apr. 27.	June 3.	7	M. to L.
Saunders	B	Apr. 27.	June 2.	5	L.
Smeltzer's Seedling No. 2	B.	Apr. 14.	May 26.	8	S. to M.
Standard	P.	Apr. 14.	May 30.	5	M. to. L.
West Lawn	P.	Apr. 27.	June 13.	8	M.
Woolverton	B.	May 1.	June 3.	5	S.
Yankee Doodle. (Renamed Epping.)	P.	Apr. 24.	May 27.	8	M.

Concerning other kinds of small fruits, the information obtained from growers through the State was so meager that no definite conclusions can be reached as to the relative value of different varieties.

A considerable number of the small fruits, including forty varieties of raspberries, fifteen of blackberries, and twelve each of gooseberries and currants have been planted

II. NOTES UPON VEGETABLES.

By C. W. Mathews, Horticulturist.

A considerable number of standard and newer varieties of vegetables were grown during the season of 1893, and a portion of the notes taken in the field are added herewith. The land allotted to this purpose consisted of a field near the College building which was somewhat exhausted through continuous cropping for a term of years, and although fertilizers were added in fair quantities, the results in size and productiveness of vegetables grown, indicated that the land has not yet reached a condition suitable to the most perfect development of garden products.

During the coming season, however, the varietal tests of vegetables will be conducted mainly upon the Experiment farm where the conditions are better adapted to produce satisfactory results.

While varietal tests of vegetables may not be the most important line of horticultural inquiry, it is believed that they are of sufficient importance to justify some attention to them, at least in the beginning of our work in horticulture, although as the work of the department develops, it is proposed to give a larger portion of our time to a study of methods of culture and plant breeding, together with a study of the fruit interests of the State.

The brief notes appended are taken from data obtained chiefly by Mr. A. T. Jordan, Assistant in horticulture.

Sweet Corn.

The following strains and varieties of corn were given ordinary field cultivation and were all planted May 11. In this and the following lists of vegetables where quality and productiveness are indicated numerically, the

figures given are based upon a scale of 0 to 10, the latter number representing the maximum in yield, quality, &c.

It has been impracticable to obtain more than approximate estimates of the productiveness of the vegetables mentioned, as it was evident that the garden was robbed more or less through the season. It is hoped that the removal of the vegetable tests to the Experiment farm, at some distance out of town, will remove this source of error in our tests through the coming season.

VARIETY.	Seedsman.	Days to Edible Maturity	Size of Ear.	Quality.	Height of Plant
First of All	Burpee	65	Small.	10	Dwarf.
Cory	Henderson	66	Small.	6	Dwarf.
Marblehead	Thorburn	68	Small.	8	Dwarf.
Ford's Early	Ford	68	Med.	7	Dwarf.
Early Champion	Vaughan	68	Med.	8	Dwarf.
Burbank	*J. & S.	70	Small.	6	Dwarf.
Pee & Kay	Thorburn	72	Med.	9	Dwarf.
Perry's Hybrid	Henderson	72	Med.	7	Medium.
Maule's XX	Maule	74	Med.	10	Dwarf.
Golden Yellow	Thorburn	75	Small.	5	Medium.
Shaker	Harris	76	Med.	8	Medium.
Everbearing	Maule	78	Med.	7	Medium.
Stabler	Ford	79	Large	6	Tall.
Stabler	Burpee	79	Med.	8	Medium.
Mammoth	Ford	79	Large	8	Tall.
Landreth Sugar	Landreth	79	Med.	10	Tall.
Black Mexican	Thorburn	79	Med.	7	Medium.
Crosby	Thorburn	79	Med.	7	Dwarf.
Nonesuch	*J. & S.	79	Med.	8	Medium.
Squantum	Ford	79	Med.	8	Medium.
Squantum	Henderson	83	Large	9	Tall.
Henderson	Henderson	83	Large	9	Tall.
Hickox	Harris	84	Med.	8	Medium.
Stowell's Evergreen	Henderson	84	Med.	8	Tall
Old Colony	Ferry	84	Med.	10	Medium.
Ne Plus Ultra	Hen. & Thor.	85	Med.	10	Medium.
Shoe Peg	*J. & S.	85	Med.	10	Medium.
Zigzag Evergreen	†N. B. G. Co.	85	Med.	10	Medium.
Country Gentleman	Henderson	89	Med.	5	Medium.
Ruby	Landreth	89	Med.	7	Medium.
Mammoth	Henderson	95	Large		Tall.

*Johnson & Stokes. †Northrup, Braslan & Goodwin Co.

Of this list of varieties, some old and others new, the following appear from this season's results to possess special value.

EARLY.

First of All, Bur. Stood at the head for earliness, of all the varieties grown last year, and, though dwarf in plant and ear like all the first early varieties, was very superior in quality.

Marblehead, Thor. This standard early variety was about as early and more satisfactory in quality than the Cory, a more recent introduction.

Champion, Vaughan. While almost as early as the above with us, had considerably larger ears and was of excellent quality.

INTERMEDIATE.

Pee and Kay, Thor. An excellent second early variety fit for use about a week later than the earliest varieties. Ear of medium size and very sweet.

XX, Maule. One of the very best intermediate varieties, ear of medium size and superior quality.

GENERAL CROP AND LATE.

Stowell's Evergreen, Hen. An old standard variety, that can still be depended upon as one of the best.

Henderson Sugar, Hen. A tall growing variety, with large ears of excellent quality.

Zig Zag Evergreen, N. B. G. Co. Kernels set irregularly upon the cob. Ears of good size, very tender and sweet.

Landreth Sugar, Land. A strong growing variety, with large ears of very fine quality.

Old Colony, Ferry. A variety of medium height, bearing fair sized ears which are exceptionally tender and of very good flavor.

Ne Plus Ultra, Hen. and Thor. and

Shoe Peg, Johnson and Stokes. Practically the same variety, in both cases bearing ears of fair size upon which the elongated kernels are very closely packed. Quality very fine. A superior variety for the home garden.

Mammoth, Hen. The latest variety grown here. Ears of very large size and good quality.

Peas.

The following varieties were all planted in a uniform manner upon April 22d. They were given no support to climb upon, but were subjected to the same conditions, so far as possible, as they would receive under ordinary conditions of cultivation.

In the tables of varieties below, in the last two columns, the weight of a half peck of peas in the pod and of the same peas shelled is given, and indicates, as well as can be shown numerically, how well filled the different varieties are.

Variety.	Seedsman.	Days to Edible Maturity.	Days to Marketable Maturity.	Length of Pod in Inches.	Productiveness Scale 0-10.	Wt. in Ozs. ½ pk. Peas in the Pod.	Wt. in Ozs. of Same Peas Shelled.	Height of Vines.
Earliest of All	Maule	54	58	2	10	63	30	Dwarf.
First of All	Henderson	54	58	2	8	64	30	Dwarf.
Alaska	Harris	54	58	2⅜	10	62	29	Medium.
Extra Early	J. & S.	54	58	2⅜	8	62	28	Medium.
Blue Beauty	Henderson	54	58	2⅜	9	65	31	Dwarf.
Little Gem	Henderson	54	58	2⅛	9	66	31.5	Very Dwarf.
American Wonder	Henderson	54	58	2⅜	9	70	36	Very Dwarf.
Wm. Hurst	Ferry	54	58	2⅜	7	.....	.....	Very Dwarf.
Premium Gem	Burpee	54	58	2⅜	7	67	33	Dwarf.
Nott's Excelsior	Gregory	54	58	2⅜	7	68	33.5	Dwarf.
Quality	Burpee	62	67	2¼	8	.....	.....	Dwarf.
American Champion	Henderson	63	67	4	7	53	22	Tall.
Melting Sugar	Vaughan	63	72	3	7	50	18	Tall, edible pods.
Telephone	Henderson	63	67	3½	7	52	22	Medium.
Duke of Albany	Ferry	63	69	3½	9	53	22	Tall.
Sutton's Satisfaction	J. & S.	63	72	2⅜	10	57	27.5	Dwarf
Quantity	Burpee	63	67	2¼	10	60	29	Dwarf.
Bliss Abundance	Burpee	63	68	2¾	10	69	35	Medium.
Horsford's Market Garden	Gregory	63	72	2¼	10	64	32	Medium.
Stanley	Dreer	63	67	3	7	59	28	Dwarf.
Dwarf White Sugar	Dreer	66	72	1¾	6	62	31	Dwarf.

Laxton's Marvel	Maule	67	75	2¾	7	59	29	Medium.
Heroine	Ford	67	75	3½	8	56	25	Medium.
Pride of the Market	Vaughan	67	72	3	10	61	26	Dwarf.
Champion of England	J. & S.	67	74	2¾	7	58	27	Tall.
Gladiator	Henderson	67	72	3	9	54	22	Dwarf.
Admiral	Henderson	67	72	2¼	10	62.5	34.5	Medium.
Everbearing	Vaughan	67	75	2½	10	63	31	Medium.
Shropshire Hero	J. & S.	67	75	3½	8	57	25	Medium.
Evolution	Henderson	72	76	3	7	54	24	Tall.
Sanders' Marrow	Henderson	72	80	3	9	58	23.5	Tall.
New Perpetual	Maul	72	80	3	6	58	25	Medium.
Juno	Henderson	72	80	2¾	7	61	29.5	Dwarf.

Our experience, like that of other Experiment Stations and private gardeners, shows that there is very little difference in relative earliness among several early varieties or strains of the smooth type. Of the peas of this character in the above list, there is but little choice between Earliest of All, First of All, Alaska and Extra Early, there being practically no difference between them.

Almost as early, and of better quality, are the dwarf wrinkled varieties, American Wonder and Little Gem; and these are of especial value in the home garden, where their superior quality, productiveness, and dwarf size make them great favorites.

It is probable, that if all of these varieties had been planted at the earliest possible date, the dwarf wrinkled varieties would have been a little later than the others, although, in the list above, they are noted as edible upon the same date.

INTERMEDIATE AND LATE VARIETIES.

THE ADMIRAL, Hen. A very productive variety, of moderate size, but not early enough to rank with the first early sorts. Quality very good.

CHAMPION OF ENGLAND, J. & S. Still considered one of the best standard varieties, fairly productive, with medium sized pods, large peas, sweet and rich in flavor.

TELEPHONE, Hen. Seed did not germinate evenly, although the plants that did grow were very vigorous. Pods very large and handsome, moderately well filled with large peas.

GLADIATOR, Hen. An excellent dwarf variety, productive, bearing long and beautiful pods, each containing 6 to 8 large peas.

DUKE OF ALBANY, Ferry. A large podded wrinkled pea, germinated irregularly. Productive, and early for a large pea.

EVERBEARING, Vaughan. A productive wrinkled variety, similar in appearance and in season to Champion of England. Pods of medium size, but well filled with very large peas.

Shropshire Hero, J. & S. A superior pea of comparatively recent introduction. Plant of medium height and prolific; pods very large and handsome, and well filled with large peas.

Quantity, Bur. A very prolific variety, bearing medium sized pods which are very compactly filled with peas which reach edible maturity, with us, about ten days later than the first early varieties. Plant rather dwarf.

Sutton's Satisfaction, J. & S. An excellent, very productive variety, resembling the last, and reaching maturity about the same time.

Heroine, Ford. A recent introduction of medium growth, fairly productive, of large and well filled pods.

Horsford's Market Garden, Gregory. A second early wrinkled variety, one of the most productive grown here. Pods of fair size. Peas very sweet even when full grown.

Tomatoes.

All the varieties named below were sown in the greenhouse on March 7, in common seed boxes, three to four inches deep. After reaching the "second leaf" stage, they were transferred to 2½ inch flower pots and afterwards to 3x4 inch pots, in which they remained until set in the field May 18, when they were planted four feet apart each way. One dozen plants of each variety were set and as they had been grown in pots, without receiving any check in transplanting, they were strong vigorous plants, and continued to grow without interruption.

The tomato rot was quite prevalent through the season, and reduced the yield materially, no varieties being exempt, and all apparently suffered to about the same extent. Experiments will be undertaken during the coming season looking toward means for checking this disease.

Many of the so called varieties mentioned in the following list are not worthy of distinct varietal names, and it is doubtful if any one could discover more than fifteen or eighteen distinct kinds in the entire lot, and very few would be able to select even that number.

Variety.	Seedsman.	First Ripe Fruit.	Size. scale 0-10.	Productiveness Sc. 0-10	Remarks.
Extra Early Jersey	Landreth	July 8.	7	6	Regular; slightly ribbed; moderately firm.
Earliest of All	Vaughan	" 8.	6	6	Somewhat angular; large green core.
Brandywine	J. & S.	" 14.	8	8	Smooth; regular; firm; bright red.
Paragon	Livingston	" 14.	8	7	Smooth; firm.
Long Keeper	Thorburn	" 14.	7	8	Smooth; firm.
Ponderosa	Henderson	" 14.	10	8	Largest size; some irregularity; solid.
Trophy, Selected	Henderson	" 14.	9	8	Somewhat ribbed; solid; vigorous grower.
Atlantic Prize	J. & S.	" 14.	8	6	
Gold Ball	Livingston	" 14	4	7	Small yellow variety; of no special value.
Rose Peach	Livingston	" 14.	5	7	Has velvety surface; few celled; not very firm.
Terra Cotta	Thorburn	" 14.	6	8	Same type as last; largest & best "peach" type
Lemon Blush	Thorburn	" 14.	7	8	Yellow fruit; like Golden Queen; showed no
No. 75	J. & S.	" 14.	6	7	["blush" here.
Conqueror	Ferry	" 14.	6	8	Somewhat irregular and ribbed.
Brinton's Best	J. & S.	" 14.	8	8	Round; smooth; firm.
Essex Early Hybrid	Ferry	" 14.	6	7	Smooth; very solid; purplish red in color,
Cardinal	Maule	" 14.	7	10	Smooth; regular; firm, and a strong grower.
Trucker's Favorite	Burpee	" 14.	7	8	
Ignotum	Ferry	" 14.	8	10	A good standard var.; smooth; regular; firm.
Early Market Champion	J & S	" 14.	6	8	Purplish red color; regular; firm; rather small.
Mitchell Improved	J. & S.	" 14.	8	8	Smooth and solid
Cumberland	J. & S.	" 14.	7	8	Smooth and solid.
Royal Red	Ferry	" 14.	8	8	Round; smooth; vigorous excellent quality.

Extra Early Bermuda	Landreth	" 14.	8	6	Somewhat ribbed.
Beauty	Ferry	" 14.	8	7	Round, smooth and solid
Early Cluster	Landreth	" 14.	7	8	Ribbed; not very solid.
Early Richmond	Landreth	" 14.	6	6	
Matchless	Maule	" 14.	8	8	Smooth and solid: an excellent variety.
Early Ruby	Harris	" 14.	6	5	
Royal Red	Livingston	" 14.	7	8	Smooth, regular and firm.
Earliest	Maule	" 15.	6	8	Slightly ribbed; solid.
Acme	Ferry	" 16.	6	8	Purplish red; smooth and firm;
Nichol's No. 5	Nichol	" 16.	8	8	Excellent new variety; somewhat purplish red.
Early Michigan	Ferry	" 16.	7	8	
Favorite	Livingston	" 18.	8	8	A good standard variety; very solid.
Lorillard	J. & S.	" 18	6	7	Has special merit as a forcing variety.
Optimus	Ferry	" 18.	8	8	Smooth; regular; firm: an excellent sort.
Dwarf Champion	Harris	" 18.	7	8	Purplish red; strong upright grower; ex. qual.
Potato Leaf	Maule	" 18.	6	8	Smooth, firm and solid.
Mansfield Tree	Maule	" 18.	9	8	Slightly irregular; firm and solid.
Stone	Ferry	" 18	8	7	Bright red; a good solid variety.
Ten Ton	Landreth	" 18.	9	10	Large and productive; regular and solid.
Matchless	Burpee	" 18.	8	8	Regular; firm.
Potomac	Harris	" 18.	9	10	Large, but somewhat irregular; solid.
Buckeye State	Livingston	" 21.	10	9	New var. of great promise; round; smooth; firm
Dwarf Aristocrat	Livingston	" 21.	6	8	Type Dwarf Champion; strong upright grower
Mikado	Dreer	" 21.	7	8	Slightly irregular, but firm and solid.
Golden Queen	Ferry	" 21.	8	9	Standard yellow variety; smooth and firm.

Beans.

BUSH VARIETIES.

Of this class twenty-six varieties were planted May 11 in drills three feet apart. The following, named in the order of their earliness, showed the greatest number of valuable qualities:

GOLDEN WAX, Ferry. One of the three earliest varieties to reach maturity, being edible forty-nine days after planting. A standard wax bean, producing bright yellow pods of good size, and very tender.

BUTTER WAX, Maule. One of the best strains of wax bean grown here. Early, and very productive of large yellow pods which were very tender and free from stringiness.

SADDLE BACK WAX, Burpee. A productive strain of wax beans, but pods not quite so long as last named.

WARDWELL'S KIDNEY WAX, Harris. Another valuable early wax variety, with handsome long pods, although not quite as productive with us as some others named.

SPECKLED WAX, J. and S. The most productive variety grown on our grounds. Somewhat later than those mentioned above, reaching edible condition in fifty-five days from planting, but showing a tendency to become stringy sooner than some other varieties.

ROUND POD VALENTINE, Livingston. One of the best green podded sorts, coming into edible condition fifty-five days after planting. A standard variety, quite free from stringiness.

LANDRETH'S SCARLET, Landreth. Next to the speckled wax the most productive variety grown. Eight or ten days later than Golden Wax with us. Pods long and tender.

POLE BEANS.

These varieties were trained to a low trellis, four feet in height, made of wire and twine. Posts were

set at each end of the row a strong wire was stretched between them four feet from the ground, and another six inches high. Light stakes were driven at intervals of twelve to fifteen feet between the two end posts to support the wires, and beginning at one end, the wires were wound with heavy twine in a spiral manner, passing the twine over the upper wire and beneath the lower wire, advancing ten or twelve inches with each turn until the farther end post was reached. This has been found a convenient and easily made support for pole beans. These varieties, with the exception of Lima beans, were planted May 11. The latter were planted May 25.

Golden Cluster, Henderson. A very productive wax variety, with long yellow pods, ready for use sixty-one days after planting.

Old Homestead, Henderson. A very abundant producer of large green pods which are more or less twisted, reaching edible maturity here sixty–three days after planting.

Scotia, Harris. Another very productive strain of green podded beans, maturing in about the same time as the last. Pods of medium size, thick and fleshy.

Improved Lima, Dreer. The most productive of several Lima beans grown here. Pods rather short, closely packed with beans of moderate size. One of the earliest Limas also, being ready for use (shelled) eighty-two days after planting.

Extra Early Jersey, Henderson. Nearly equal in productiveness to the last named, a few days later with us, but bearing larger pods. Beans of medium size.

Ford's Mammoth Podded, J. and S. About two weeks later than the earliest varieties, maturing here in ninety-five days and fairly productive; pods and beans of large size.