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BLUEBERRIES**

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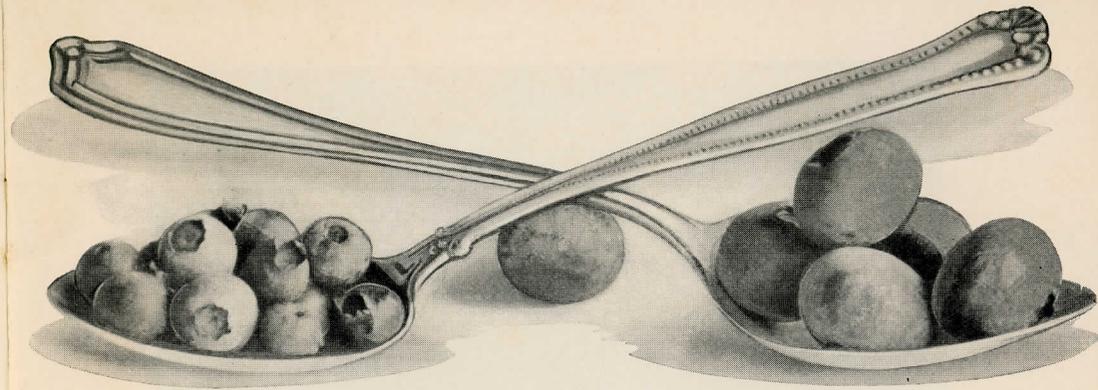
JOSEPH J. WHITE, Inc.

NEW LISBON, N. J.

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Blueberries *and* BLUEBERRIES

BY J. HORACE McFARLAND

THIS is a call on the imagination of the reader. When it has been answered, he will know why the heading is in two sizes of type; why the subject name is repeated.

Not all of us have seen Alaska, America's northwestern territorial extension, nor have all of us seen Hawaii, our dots in the central Pacific, or diminutive Guam, or the sub-equatorial Philippines. The maps locate these faraway parts of the United States, but it is the imagination that sets before one the blue-iced glaciers of the Far North, the soft airs and the mighty waves of Honolulu, and the tropical richness of the land that Dewey fought for. We believe they exist, though we have not seen them, these distant parts of our nation. Imagination does it.

Few in the United States do not know what a Blueberry is. The name—sometimes Huckleberry or Whortleberry—brings to mind little blue-black round berries, averaging smaller than peas, and tasting—well, tasting like Blueberries, which are not like anything else, and are not like each other. Who does not remember an occasional Blueberry that seemed better than its fellows in the dozen and more that a teaspoon holds? In pies, all Blueberries we have known tasted alike, and the taste was good; but eaten as a dessert fruit, we have needed sugar and milk—or cream, if Mother wasn't watching—"to bring out the flavor." It has not always been certain whether we were eating the combination for the Blueberries or for the sugar.



A BLUEBERRY PACKING SHED AT WHITESBOG

Note how much lighter colored some quarts of berries are than others; this is because they are from seedling plants, each of which is different. The berries are carefully inspected and each quart is covered with a paper cap before being packed in 32-quart crates. The caps for the best berries carry the brand, "White Star Blueberries" and the grower's name, Joseph J. White, Inc., New Lisbon, N. J.

Now for the call on the imagination. Conceive of Blueberries that will hardly slip through a wedding ring—unless your wife is a giantess. Conceive that these Blueberries, unbelievably big, are all good and sweet; and imagine eating them separately, one at a time, as you would eat a good cherry or a good strawberry. Sugar? Not necessary! Cream or milk? Well, a possible, but not an important adjunct, unless as an excuse to add the sugar the Blueberries do not demand. Conceive, too, that there is a piquancy of flavor, a faint trace of attractive acidity, in these impossible Blueberries.

Such is the Blueberry as it is here desired to set forth. It is the color of some of the Blueberries you have known, but that is the only definite resemblance.

Let us go further in this demand on the imagination, so as to have the actual truth more easily bloom in our minds. The old-fashioned Blueberries grew on several sorts of bushes, some a foot high, some a yard high, and some as tall as a man. Some were crowded with fruit, in great clusters of ripe and unripe berries; some were but sparsely set. Some were mildly attractive as plants, at least until the fall frosts set the foliage glowing in crimson.

But these super-Blueberries are otherwise borne on compact and slightly plants, many of them as handsome in foliage as any prized broad-leaved evergreen. The fruit comes on them in astonishing clusters, in various stages of ripeness, all covered with a whitish "bloom" that seems like Nature's veil. One dislikes to take out the riper berries, yet easily does it so rapidly that the quart-box is filled in less minutes than it took to get the box a quarter full of the familiar wild Blueberries, and that without walking to a dozen or more bushes. Is it any wonder that the pickers in a field of these super-Blueberry plants make records of a hundred quarts in a day?

The photographs ought to aid the imagination in arriving at the size factor, but the merits of these Blueberries in flavor and sweetness will have to be accepted on faith, on the imagination these words seek to stimulate into action.

There are "Blueberries and Blueberries."

THE HISTORY OF THESE SUPER-BLUEBERRIES

How did they come about? The story is too long to be told here, though intensely interesting. It may be briefly stated and it also may well be summarized in a single phrase—*Selection and Hybridization, plus Care and Culture.*

The cultivation of unselected Blueberries has in at least two instances resulted in definite plantations that produced profitable and continuous crops.

The first of these plantings included a little less than two and a

half acres, near Elkhart, Ind. It was described in a publication of the United States Department of Agriculture, issued in 1910, by Frederick V. Coville, Botanist of the Department, who says, "It was started in 1889 in a natural Blueberry bog, which was first drained and then set with unselected wild Blueberry bushes. The plantation was profitable from the first."

Another similar plantation was that called a "huckleberry orchard" by its originator, who justifies the name when he tells us that the bushes are 10 to 12 feet high. An account of Mr. Sapp's plantation was given by Mr. George E. Murrell in the *Journal of Heredity* for June, 1919. Mr. Sapp himself tells his story in *The American Fruit-Grower* in November, 1919. He began with the idea of digging up "a few bushes from the swamps nearby as an experiment to cultivate around my premises for home use, hoping to enlarge and improve the fruit in quantity and quality." Succeeding promptly in his aim, his neighbors demanded fruit. He kept on until he had six acres in the "huckleberry orchard," and he has never yet been able to "fill half of the orders that are received from the first of June to September, the fruiting season," though he says that he often picks "from ten to twenty-five quarts at one picking from one clump of bushes."

Other minor instances of success are available. They serve to settle the soundness of Blueberry culture, even with unimproved plants, which means, without doubt, a very great new source of satisfactory and delightful food for production from lands otherwise waste or nearly waste; for the Blueberry requires acid or sour soil.

THE SCIENTIFIC DEVELOPMENT

Since 1911, Blueberry improvement has been studied in an orderly way by coöperation between the Bureau of Plant Industry in the Federal Department of Agriculture and the firm of Joseph J. White, Inc., New Lisbon, N. J. Those who organized the latter firm have been extensively engaged for three generations in Cranberry culture in New Jersey.

It should here be noted that, botanically, the Blueberries are in the same family as the Cranberries, so that to a certain extent soil conditions for one fruit are favorable for the other.

Frederick V. Coville, the Botanist of the United States, who operates in the Bureau of Plant Industry at Washington, has intensively studied Blueberry development under the favoring conditions provided by Joseph J. White, Inc., at the Cranberry plantation known as "Whitesbog," near Browns Mills, N. J. There selection, hybridization, cultivation, and scientific testing, have all been thoughtfully practised for ten years.

About twenty-five acres of established plants have resulted, and

the sight of the fields during the weeks of fruiting is calculated to stir the blood of a visitor who is interested in the food necessities and the food possibilities of the land, or, to put it much more simply, who likes Blueberries,

At no time in these ten years of patient study and experimentation have any of the painstaking workers been satisfied that a finished result had been secured; yet the marketing of the relatively large product, and the prices eagerly paid for the berries that were so marketed, have indicated that with less high ideals, there might long ago have been put over a plant-selling campaign of an unusual character.

THE FUTURE OF BLUEBERRY CULTURE

It is believed that the thoughtful, painstaking, and discriminating grower who has access to suitable land, who will understand that Blueberry culture is in a state of development, may make satisfactory profits by the use of these wonderful varieties as they are obtainable. No one, however, must get the impression that these Blueberry plants can be set out anywhere by anybody under any conditions and produce fruit profitably, as would the blackberry or the currant. The future of the Blueberry industry rests on the nice balancing of irrigation and drainage and in the use of suitable land. Much land that is now waste is admirably suited to Blueberries and may be made very profitable by the use of these new varieties. To capable experimenters we fully commend the effort.

BLUEBERRIES FOR ORNAMENT

It is well known that the flowers of *Vaccinium corymbosum*, the species mostly used in the production of these super-Blueberries, are beautiful, and that in fall the foliage turns to beautiful shades of crimson. Indeed, the shrub is commended by the Arnold Arboretum of Harvard University as one of the very best for its purely ornamental uses.

These new varieties introduce new factors in foliage, in flower, and in fall color. Many of the plants are of distinctly globose form, and with large and attractive leaves during all the growing season. With their daintily tinted flowers they are exquisitely beautiful, and that beauty is changed, but not diminished, as the crop succeeds the flowers.

It is believed, therefore, that with the provision of suitable soil, as is nearly always possible, there exists a notable use for these super-Blueberries in ornamental plantings.



From National Geographic Magazine, Washington, D. C., Copyright, 1916

A QUART OF RUBEL BLUEBERRIES

Rubel bushes are remarkable for their beauty, vigor, and symmetry. The original was over 6 feet high and nearly as broad. The coloring is exquisite the year round: Ruddy sprouts, pink buds and white flower bells come in the spring. July brings great clusters of light blue berries to contrast charmingly with the deep green foliage. Autumnal frost turns this to richest crimson and all winter long the red twigs are most cheerful.

Whitesbog Blueberries

BY ELIZABETH C. WHITE

GOOD varieties of fruit must be planted if our labor of cultivation is to be rewarded.

A wild apple tree which produces forlorn, puckery little apples, even if cultivated, fertilized, pruned, and sprayed in the most approved manner, never yields fruit that tempts you to buy it, and if you bite into one of the little apples you find no pleasure in its taste. On the other hand, when the original Baldwin apple tree was found—a chance, wild seedling—the apples were large, beautifully red, and of delicious flavor. Now, Baldwin apples, brought to greater perfection by careful culture, so charm the coin out of your pocket by their beauty that you are glad to have exchanged it for anything so delicious.

When Blueberry culture was undertaken at Whitesbog, the most pressing problem was that of securing good varieties.

But what are Blueberries, and how do they differ from Huckleberries? Dr. Coville explains: "In the southern United States and in the Middle West blueberries are not ordinarily distinguished from huckleberries, but in New England the distinction is very clearly drawn. The name huckleberry is there restricted to plants of the genus *Gaylussacia*, the berries of which contain 10 large seeds with bony coverings like minute peach-pits, which crackle between the teeth. The name blueberry is applied in New England to the various species of the genus *Vaccinium*, in which the seeds, though numerous, are so small that they are not noticeable when the berries are eaten. It is probable that the comparatively low estimation in which this fruit is held in the South is largely due to the lack of a distinctive popular name and the consequent confusion of the delicious small-seeded southern *Vacciniums* with the coarse large-seeded *Gaylussacias*."

The southern lack of distinction between these two fruits prevails in New Jersey where all kinds of wild Blueberries and Huckleberries are called Huckleberries, but the New England term Blueberry has been adopted for those cultivated at Whitesbog.

Varieties of Whitesbog Blueberries have been secured in two ways: by selection from wild bushes and by selection from seedlings of chosen parentage.

SELECTION FROM WILD BUSHES

Whitesbog is in a section of New Jersey from which thousands of bushels of wild, High-bush Blueberries, or Swamp Huckleberries as they are called locally, are marketed each year.

Selection was started by offering a price for wild Blueberry bushes with extra-large berries. This stimulated a search of the swamps within 20 miles of Whitesbog, and those who pick the berries for market brought in many samples of fine fruit. Between 1911 and 1916 a hundred bushes were purchased, with berries five-eighths of an inch or more in diameter; two had berries fully three-quarters of an inch across.

As Blueberries do not "come true" from seed, the selected wild bushes were divided into many pieces from which young plants were grown. Those from each original bush were kept separate and the plants of each lot have their own particular characteristics, perpetuating the peculiarities of the bush from which they came; in other words, the plants from each original bush constitute a separate variety.

The chief characteristics considered in selecting varieties are size, flavor, texture and time of ripening of the berry and productiveness and vigor of the plants. A very important quality is resistance to injury by occasional spring frosts; for one variety is uninjured by frost when another growing beside it has its blossoms and young growth killed.

The first selection of wild bushes was necessarily based on size of berry, but a careful study of all characteristics was made during several years when numerous young plants grown from the original bushes produced crops under field culture. As a result, most of the varieties were discarded.

Six only, of the hundred, were considered worthy of further multiplication for commercial fruit production. These are known as Rubel, Harding, Sam, Dunfee, Adams, and Grover, each name perpetuating that of the discoverer of the original plant. These varieties of Blueberries are as distinct one from another as are varieties of strawberries, apples, or any other fruit.

SEEDLINGS OF CHOSEN PARENTAGE

All during the time that selection of varieties from wild bushes has been in progress, Dr. Frederick V. Coville, Botanist, of the United States Department of Agriculture, has been improving Blueberries by breeding.

The varieties of wild origin selected at Whitesbog and a few plants from other parts of the country have been used as parents. More plants from different parts of the country could be used to advantage in the breeding work. For this reason, Joseph J. White, Inc., offers \$25 to \$50 each for good plants with berries nearly or quite three-quarters of an inch in diameter. Write for particulars.

When the breeding work reached a point where it was desirable to try the seedling plants in the field, the Department of Agriculture contracted for trial-grounds at Whitesbog. Under the terms of the contract, Joseph J. White, Inc., has the right to half the propagating material from all desirable Government seedlings there tried, but agrees not to propagate for sale any hybrid not approved by the Department.

The hybrid seedlings are kept at Washington a year and then sent to Whitesbog where they are set in the field about September 1. The second summer in the field they sometimes produce a few berries, and the third summer a commercial crop.

Seedlings of the same parentage have a certain family resemblance, so much so that those familiar with the parent plants can frequently recognize the origin of a group of seedlings without reference to the elaborate records. Yet no two plants of the same parentage are alike; consequently no two plants in the trial-fields are alike, and each is the possible beginning of a new variety.

More than 27,000 plants have been set in the trial-fields, of which about 18,000 have produced fruit. Of all these only three have been approved by the Department and are being propagated for commercial fruit production at Whitesbog and to produce plants for sale.

In the breeding records these three Coville hybrids are known as 620A, 830C, and 834A, but have now been christened by Dr. Coville, Pioneer, Katharine, and Cabot. These hybrids are much larger than their parents, the best Blueberries known when these early crosses were made, but they are little if any larger than Rubel, Harding, and other varieties since found.

DESCRIPTION OF VARIETIES

Whitesbog Blueberries average well above half an inch in diameter, with an occasional three-quarter-inch berry. People frequently speak of them as seedless, because the seeds are so small. They are all High-bush Blueberries (*Vaccinium corymbosum*) and grow from 4 to 8 feet in height. The plants are remarkably free from attack by insects or disease.

RUBEL bushes are remarkable for their beauty, vigor, and symmetry.

The original was over 6 feet high and nearly as broad. The coloring is exquisite the year round: Ruddy sprouts, pink buds and white flower bells come in the spring. July brings great clusters of light blue berries to contrast charmingly with the deep green foliage. Autumnal frost turns this to richest crimson and all winter long the red twigs are most cheerful. A large proportion of Rubel berries are over $\frac{5}{8}$ inch in diameter. If picked soon after they color, sugar is needed to temper the pleasant acidity, but if left on the bush a week or two they grow sweeter without deteriorating. Their keeping and shipping qualities are unusually good.

HARDING berries are sweet and of especially fine flavor; a most delicious fruit for the home table and nearby markets, but a little too tender, possibly, for long shipment. They ripen a few days earlier than Rubel. The berries are about the same size and much darker blue. The plants are vigorous and the autumnal coloring fine.

SAM berries are uniformly large and produced in immense clusters which ripen earlier than Rubel or Harding. They are a beautiful light blue and of delicious flavor. The foliage is rich and heavy in texture and the leaves are veiled with a delicate bloom, in consequence of which the summer foliage is bluish green, somewhat the color of cabbage leaves, and there is a charming hint of violet over the autumnal crimson. The winter twigs are red.

ADAMS is the earliest of these varieties. The berries do not often exceed $\frac{5}{8}$ inch in diameter, but they are remarkably uniform in size, of excellent flavor, and produced in immense quantities. They are of medium blue and have a tendency to be pear-shaped. The bushes are symmetrical and well formed. The autumnal coloring is not remarkable and the winter twigs are green, but the summer foliage is probably the best of all the Whitesbog Blueberries. The lustrous, dark green leaves, of heavy texture, resemble those of some of the most prized broad-leaved evergreens and call forth the utmost enthusiasm from plant-lovers.



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PIONEER, ACTUAL SIZE

GROVER berries are among the largest, with flavor and texture unsurpassed. They ripen almost as late as Rubel. The bushes are strong and vigorous, but compared with other varieties in this group are not remarkable for their beauty.

DUNFEE produces immense quantities of large dark berries, which many visitors say are "the best of all." The foliage, of heavy texture, is peculiar in that the first spring growth is mottled with grey lines as if the leaves were covered with light cobwebs, but the summer growth is uniformly a deep glossy green. The autumn coloring is exceedingly beautiful and the winter twigs the brightest red of all.

RALPH is being propagated for its beauty. The berries are not large enough to meet the Whitesbog standard for commercial fruit production, as few of them surpass $\frac{1}{2}$ inch in diameter. They are, however, uniform in size, early, of good flavor and a beautiful light blue. They are borne in large, graceful, somewhat drooping clusters. The bushes are compact and symmetrical, the foliage is good, and the autumn coloring gorgeous.

The point on which Ralph scores above every other variety of Blueberry, however, is in the exquisite beauty of its flowers. All Blueberries have beautiful flowers—clusters of waxy white bells, with buds greenish or pink according to the variety—but none equal those of Ralph in slender grace of form or rosy coloring, which delicately tints the flowers and shades to carmine in the buds. A very lovely variety.

PIONEER (Coville hybrid 620A) is the first seedling from the Government trial-grounds selected for propagation. In 1917, when the plant was five years old from seed, it was picked four times and yielded a total crop of $2\frac{1}{2}$ quarts. There were 394 berries in the *third* picking of which only 30 were less than $\frac{1}{2}$ inch in diameter. The berries are light blue, sometimes slightly streaked, as if they had grown so large there was not enough blue to cover them all over. The flavor is good. The foliage, of heavy texture, is fine in its autumnal coloring and the winter twigs are red.

CABOT (Coville hybrid 834A) is an early berry, very large and of attractive appearance. In flavor it is one of the best, a delightful combination of sweetness and sub-acidity.

KATHARINE (Coville hybrid 830C) is of the same parentage as Pioneer. The two were selected from over 3,000 seedlings of one of the early crosses made by Dr. Coville. The berries of Katharine ripen a week to ten days later than those of Pioneer; they average larger and are exceedingly beautiful. The rich green foliage is so heavy in texture that a noted botanist, seeing it for the first time, insisted that those leaves *must* be evergreen. The autumnal foliage and red winter twigs are very similar to those of Pioneer in richness of color.

HARDINESS AND LENGTH OF SEASON

Whitesbog Blueberries are all hardy in central New Jersey. They came through the remarkably severe winters of 1917-18 and 1919-20 in perfect condition. They are also resistant to injury by spring frosts. There is good reason to believe them adapted to a wide range of climate, but they can hardly be expected to thrive through the whole range of wild Blueberries, various species of which abound from the Gulf Coast to Alaska and Labrador. In climates markedly different from that of New Jersey, the cultivation of a few of the best local bushes, in comparison with those from Whitesbog, would lead to further knowledge of the most desirable kinds for different parts of the country.

At Whitesbog, the named varieties ripen from about July 4 through the second week of August. Varieties are being selected which will start the Whitesbog Blueberry season about the middle of June and others can be selected which will carry it beyond the first of September. The steady work for pickers which so long a season provides is an important consideration in commercial Blueberry culture.

REVENUES FROM WASTE LAND

Whitesbog Blueberries make possible large revenues from thousands of acres which are now waste land. This is demonstrated by results which have already been secured. Though none of the bushes are old enough to yield a full crop, the older portion of the trial-fields produced 96 bushels per acre in 1919 and 117 bushels per acre in 1920. The plants, however, are spaced 3 by 5 feet and yield more per acre while young than if spaced 4 by 8 feet, as the fields are now planted.

The berries marketed from Whitesbog up to 1921 were all from plants under trial, consequently they were much inferior in size and