should be evaluated as *separate varieties.* The practice of selecting sports solely on the basis of fruit color or growth habit is unsound, in view of these findings.

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On the Domestication of the Lowbush Blueberry

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The highly flavored lowbush blueberry is a crop that is cultivated by time established methods. "Tradition says that the (blueberry) barrens of Maine were first burned over by the Indians to encourage the growth of blueberries at some remote period long before white settlers came to the valleys of the Narraguagus and Pleasant rivers." Gathering blueberries on these barrens was a public privilege for more than a hundred years after the neighboring seacoast towns were first settled. After more than 150 years, with the exception of systematic pruning by fire and controlling certain insects, cultural practices have changed little. Due to the "wild" nature of natural commercial stands planting, fertilizing, weed control and other cultural practices have been generally unsuccessful or inefficient. The abundance of competing flora has been a major obstacle in attempts to increase yields of lowbush blueberries.

Blueberry fields of Maine and Eastern Canada are comprised of two major species, *Vaccinium angustifolium,* the common lowbush blueberry, a tetraploid; and *Vaccinium myrtilloides,* the sour top blueberry, a diploid. Individual clones of these species are scattered over approximately 100,000 acres of cleared land in Maine resulting in a wide range of morphologican variation. In addition, the extreme irregularity of the topography generally deters the development of mechanized practices such as mechanical harvesting.

To overcome many of the difficulties encountered by the lowbush blueberry grower, research at the University of Maine has been directed toward the establishment of new plantations, specifically toward clean cultivation in rows similar to strawberry culture. Many superior selections have been made over the years which make up a nucleus of future varieties. Propagation of lowbush blueberry plants by softwood stem cuttings or rhizome cuttings has proven successful. Up to 99% rooting has been attained with the former method (1). A deterent in establishing row cultures is the retarded development of rhizomes after transplanting. The subterraneas rhizome system is the chief means of plant spread within the row.

Development of vigorous plants with a pre-established rhizome system prior to transplanting is necessary to overcome the lag in rhizome development under field conditions. Vigorous plants can be obtained by maintaining rooted cuttings under relatively high temperatures and long photoperiods (3) as well as an optimum soil environment (2).

Several field trials were established

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from 1962 to 1967 to culture lowbush blueberries under an organized system. Seedling rows planted in 1962 after 4 years formed a dense mat of vigorous and highly productive stems (Figure 2.) Yield records taken in 1967 showed these rows produced 2½ tons of blueberries per acre, a substantial increase over the ½ ton average yield obtained under the present system of lowbush blueberry production. Rows were 4 feet apart with seedlings set 12 inches apart in the rows. Rows were maintained at a 2 feet width. Although transplanted seedlings spread rapidly to fill the beds, the variability in fruit characters make this sources of plant material less desirable for commercial production than clonally propagated plants.

In 1964, a study was initiated at the Blueberry Hill Research Farm at Jonesboro, Maine to compare various sources of vegetatively propagated lowbush blueberry plants and seedlings at various spacings in nursery rows. Materials tested included rooted softwood stem cuttings of two selected clones, rhizome cuttings, transplanted blueberry sods (6″ diameter) of a single field clone, and seedlings. The softwood cuttings were rooted in the summer of 1963, dug in the Fall and stored at 32°F until Spring, 1964. Rhizomes were dug prior to planting and cut into 4 inch sections and set directly in the rows. Seeds were germinated in the Fall, 1963, the seedlings grown in the greenhouse for two months, hardened off, and stored at 32°F for Spring planting. All rows were 25 feet long with 4 feet between middles. In single rows, all plant materials were set at 12 and 24 inch spacings. In double alternate rows, all plants except sods were set 12 inches apart in two rows in each bed. Rooted stem cuttings and seedlings were also set at two depths (1) slightly deeper than they previously grew and (2) at a lower depth allowing 3 to 5 basal buds to remain underground. All plants were mulched with sawdust. The matted rows were allowed to develop to a width of 24 inches.

Records on the rate of plant spread showed that seedlings offered the best

Fig. 1. A comparison of strawberry matted rows (left) and low bush blueberry matted rows (right). This new culture for blueberries may hold a promising future for commercial fruit growers and home gardeners.

means of establishing a matted row. A twelve inch spacing in an alternate double row was superior to the wider spacing. Transplanted sods containing intact mature rhizomes also became established with relative success. Rooted cuttings exhibited a slower rate of spread but after 3 years formed an acceptable matted row. With seedlings, rooted cuttings and sods, the largest number of plants per acre resulted in the most rapid establishment of beds. Direct planting of rhizomes in the row was entirely unsuccessful because of high initial mortality. Depth of planting had no apparent effect on the rate of spread of rooted cuttings or seedlings. Seedling, sod, and rooted cutting rows produced fruit within three years.

In summary, evidence has been obtained to demonstrate the benefits of intensive lowbush blueberry culture. This fruit can be adapted to a row culture consisting of 2 to 3 foot wide permanent beds to produce improved quality and quantity. Under an intensified cultural program cultivation and chemical weed control have significantly reduced weed populations. Fertilization and pest control have become more efficient and level land aids in all practices involving the operation of machinery. Row cultures also lend themselves readily to mechanical harvesting.

Lowbush blueberries are also being recommended as a ground cover in the ornamental garden. The plants make an attractive as well as tasty addition to the home landscape. They are particularly effective on steep slopes or where it is necessary to control soil erosion.

These pioneering efforts to develop an entirely new cultural system for the Small Fruit Industry hold a promising future for commercial growers and home gardeners.

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Sweet Cherry Breeding In England

Breeders at the John Innes Institute indicate (57th Annual Rpt., 1966) that the following sweet cherry crosses have given a high proportion of seedlings with above-average commercial quality:

Emperior Francis x Bedford Prolific
Ursula Rivers x Van
Ursula Rivers x Van
Ursula Rivers x J. I. Seedling 1464
Van x Late Black Bigarreau
Wellington 'B' x Merton Heart
Wellington 'B' x Merton Heart

Of 113 cultivars tested, the following have shown high resistance to bacterial canker: Black Elton, Black Oliver, Caroon "B", Chapman "B", Cleveland Bigarreau, Guigne de Winkler, Hedelfingen Riesenkirsche, Ludwig's Bigarreau, Maiden's Blush, Merton Premier, Nutberry Black, Purple Griotte, Reidern 2nd Early Black, Sam, Smoky Dun, Strawberry Heart, Turkish Black, Yellow Spanish. Such cultivars have been crossed with parents of high fruit quality. In addition, self-fertile seedlings have been crossed with the cultivars showing high resistance to bacterial canker.

Attempts are also being made to propagate dwarfing cherry rootstocks as seedlings. The most promising possibilities seem to be seedlings from open-pollinated cultivars known to be heterozygous for the dwarfing gene. One cultivar, Turkey Heart, has produced 318 dwarfs out of a population of 1490 open-pollinated seedlings.