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VARIETIES AND LOCATIONS AS FACTORS IN APPLE PRODUCTION

By V. R. GARDNER

Prices. During recent years the average F. O. B. shipping point price in Michigan for A-grade apples of all varieties has been about \$1.25 per bushel, about \$0.92 per bushel for B-grade stock and \$0.26 for culls. The better standard varieties, such as McIntosh, Fameuse, Jonathan, Rhode Island Greening, Northern Spy and Canada Red, have averaged somewhat higher—about \$1.50 for the A-grade during the same period. There is no reason to expect a material rise in these averages within the near future, except perhaps as the lower priced varieties are eliminated. The business of apple production must therefore be so organized and conducted that the enterprise is profitable in spite of low or at best moderate prices, if profits are to be realized at all.

Varieties. In the first place much is to be gained by growing only the higher priced varieties. Twenty-five cents per bushel difference in selling price may mean the difference between profit and loss and in any case is a margin large enough to challenge the attention of any grower. Price alone, however, does not measure the value of a variety. It is equally important that the "tree-run" fruit should grade out well as it goes over the sorting table, for the real profit lies in the A-grade fruit. The lower grades seldom bring prices that leave much of a margin over growing, harvesting and handling costs.

Even more important, the tree must be a heavy producer. If it comes into bearing young, so much the better, but heavy production in the mature tree is of the utmost importance. This should be self evident but actually it is generally given second consideration and the evidence indicates that many growers practically ignore it. No matter what a variety sells for per bushel there must be bushels to sell if there are to be returns, to say nothing of profits. Furthermore as the yield per tree or per acre increases the production cost per bushel decreases and the margin of profit automatically widens.

It has been said that variety lists are being increasingly determined in the market. Within certain limits, this is true. The wholesaler and the retailer will pay a good price for what he can sell and sell readily—not what some producer may want to unload on him. Growers should plant and produce those varieties, and only those varieties,

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for which the demand is good. There are enough good varieties from which to choose. If growers have trees of varieties that are generally a drag on the market, the practicability of destroying them or top working to better sorts should be carefully considered.

For the most part "quality" varieties only are wanted. The only important exceptions are Yellow Transparent and Duchess, early sorts used exclusively for culinary purposes. Other inferior quality varieties such as Ben Davis and Stark are still important factors in the market but they are on the decline.

Applying these general variety specifications to Michigan's variety list and her climatic, soil and market conditions the following conclusions may be drawn from data that have been obtained:

Of the summer varieties, Yellow Transparent, Duchess, Chenango, and Wealthy are the most profitable. The first two are already heavily planted and further planting is not warranted. Indeed there is good reason for topworking many Duchess orchards, particularly in the northern part of the state, to later varieties. The season of Wealthy is later and longer but future plantings of this variety should be made conservatively, probably principally with the idea of supplying local markets. There is room for a limited planting of Chenango for roadside or other special local markets. Its general planting for carlot shipments is not warranted.

Of the late fall and winter varieties, Snow, McIntosh, Jonathan, and Grimes head the list. The first two varieties are especially well suited to the more northern, the last two to the more southern producing areas, though Snow and McIntosh will prove profitable to the Indiana-Ohio line. These varieties are equally well suited to carlot shipments and local markets. Delicious has not proven productive but there is good reason to believe that this condition can be remedied. However, the indications are that it will be relatively more profitable for local than for general markets and future planting should be done accordingly.

Among the midwinter sorts, Rhode Island Greening and Northern Spy stand out prominently. If a third variety of this season is required Baldwin must be considered a contender for this place.

For late winter-early spring demand Canada Red should receive first consideration.

Many other varieties are proving profitable. On the average they are not so profitable as those that have just been named. It is, however, doubtful if growers who have trees of such varieties as Wagener, Winter Banana, Opalescent, Northwestern Greening, Golden Russet, Ben Davis, Stark, Alexander, and Wolf River can afford to graft them over unless they are still young.

Grades. The difference between the prices received for different grades of apples has been mentioned. The importance of this difference becomes apparent when it is stated that only about one-half of the "tree-run" product from the average commercial orchard is of A-grade and that the grading records for the orchards of individual growers range from 20 to 80 per cent "A's". Many factors combine to cause the grading down or culling of Michigan-grown apples. Field and packing house studies show that on the whole more culling has been necessary because of small size, limb rub and mechanical bruising than

because of fungous and insect injuries. After the field checking of the grading records of individual orchards with the condition of their trees and their cultural and management methods, the one thing that stands out so clearly and distinctly that there is no possible chance of missing it or of misinterpretation is that the trees in the high-grading orchards are vigorous; those in the low-grading orchards lack vigor. In some instances the trees are vigorous because they are young; older trees in the same orchards are less vigorous and produce poorer grade fruit. In most cases, however, vigor is determined largely by soil and soil treatment. Where the soil is strong, fertile and deep, or where it is deep and light but natural fertility has been supplemented by very liberal use of farm manure and nitrogenous fertilizers, the trees are reasonably vigorous and produce good fruit. Where the soil is shallow or light and infertile and the trees obviously underfed, the grade has been poor.

Yields. Records of a large number of commercial apple orchards in western Michigan covering a period of five years show that the average yield of trees in full bearing is about six and one-half bushels apiece. This includes seasons of crop failure, as well as crop years, and trees in poor as well as those in good locations and sites. In some orchards the average yield barely exceeds two bushels per tree; in others with the same varieties it has been as high as 15. Detailed production costs are not available for these individual orchards, but there is reason to believe that where average grade fruit is produced and sold at average prices, average yields provide for little more than cost of production. In the light yielding orchards fruit is certainly being produced and sold at a loss. It is only from the more productive orchards that real profits are being realized.

As in the case of grades, there are certain factors associated with high yields and certain others that apparently are mainly responsible for low yields. Chief among these is location or site. As things now stand, the grower's greatest hazard is damage from spring frosts. Their occurrence is irregular but certain. Against them he has but one insurance—the choice of a favorable location. (Frost protection through the use of orchard heaters has thus far not proved practicable under Michigan conditions). Many orchards are so located that one, two, or three years out of ten the crop is entirely destroyed by frost and even more frequently damaged.

On the other hand, ideal sites do not guarantee yields. The soil itself and soil management methods must be such that the trees grow vigorously. It may be coincidence but it is not mere accident that the most productive orchards are located on deep rich fertile soil, soil that is well drained and in which the roots penetrate deeply. Furthermore the best growers, even when their orchards are on fertile land, are liberal users of nitrogen-carrying fertilizers.

Efficiency in production is a product of three main factors: (1) the place where the trees are to grow, by which is meant site and soil, (2) the choice of the right varieties and (3) care of soil and trees. No choice of varieties and no amount of attention devoted to soil management or to care of the trees themselves will compensate for a poor site and poor soil. Good site and good soil may be written in bold face type as the first and the foremost requirements of a successful

orchard enterprise. Alone they do not guarantee success but success is not possible without them. Enough evidence is available to convince the most skeptical of the importance of choosing good varieties. Proper care of the bearing apple orchard is largely a matter of maintaining soil fertility, controlling its water supply and of thorough, timely spraying.

Note:—This circular presents in condensed form the results of a field and packing house study of the apple variety situation in Michigan. The detailed results of the study are presented in Special Bulletin No. 161 of the Michigan Agricultural Experiment Station, a copy of which may be obtained upon request.