



A Class in Box Packing at the Oka Agricultural Institute, La Trappe, Que.

This institute is a leader in horticultural education in the province of Quebec. The Three-Two Diagonal pack is here being used. Rev. Father Leopold is the second figure on the left. He has recently been elected president of the Province of Quebec Fruit Growers' Society.

eful of "food" no increase. The manure is of value not because of any "food" it contains. He misunderstands my argument.

When Mr. Emslie becomes personal and refers to "his own prescriptions," he is even here also in error. I am not a physician. I am simply a specialist in plant diseases and in soil fertility. His reference to soil constituents as "hash" is no argument. It is disposing of the

## Fertilizer for the Orchard

**D**R. J. P. Stewart, Experimental Pomologist of the Pennsylvania Experiment Station at State College, Pa., discussed the use of fertilization and cultural methods in apple production at the recent convention in Toronto of the Ontario Fruit Growers' Association. His deductions were based on six years' work in ten experiments located in the leading apple sections of Pennsylvania and involving ten different soil types and two thousand two hundred and nineteen trees. The trees range from ten to forty years of age, and have produced over one million seven hundred thousand pounds of fruit since the work started.

These experiments have shown: First, that in some orchards the yield can be greatly influenced by proper fertilization, the most important elements of which have been nitrogen and phosphates. With all other conditions uniform, the gains from such fertilization have run as high as seventeen times the amounts of fruit produced on the adjacent checks or untreated plots and net profits have been as great as four hundred and twenty dollars an acre in a single season. Under

question as an orchardist does who, when he wishes to rid his orchard of insect pests, goes into the orchard and says "shoo." To compare fertilizers to a "dose of salts" is far too flattering to the fertilizers.

In conclusion let me thank the editor for this space, and say that the plant must answer. The plant is the chemist who must pronounce upon the value of a fertilizer.

these conditions, tillage and cover crops have not been the equivalent of fertilization. The gains from the former have averaged about one hundred bushels per acre annually, while the latter, without cultivation, was giving four hundred and fifty-two bushels a year.

Second: The absence of nitrogen, as a rule, applications of phosphates and potash have not been profitable. On some soils, and in the presence of sufficient nitrogen, however, moderate amounts of these minerals are often profitable. Neither has had any material influence on color. On size, the influence of potash has been favorable.

Third: Nitrogen has had greater influence in increasing yield than any other element. It also has materially decreased color. This is due primarily to delay in maturity, and may be overcome by later picking, which is advantageous in Pennsylvania with such varieties as Baldwin. The delay on it in one locality in 1911 was three weeks.

Fourth: Contrary to a prevalent notion, growth and fruiting are not antagonistic, unless either occurs in abnormal amount. The best growing plots,

as a rule, have been the best fruiting plots.

Fifth: Manure has usually proved profitable, doubtless essentially because of its nitrogen content. In most of the cases where it has proved beneficial, however, its net profits have been approached or surpassed by certain combinations of artificial fertilizers.

Sixth: In a few orchards no form of fertilization has yet produced a material response. This is considered to be due to the presence of other limiters, of which improper moisture supply is frequently important. The existence of such orchards emphasizes the need of local tests before making large and regular expenditures for fertilizers. Simple methods of making these tests and a good general formula for preliminary use were indicated.

Seventh: In the long run, any orchard that is actively producing and growing is likely to require fertilization, since the total plant food draft of such an orchard is quite heavy—more per acre for every constituent except phosphorus than is required by a twenty-five bushel crop of wheat.

### CONTROLLING THE COLOR

Eighth: Color in apples is essentially dependent on maturity and sunlight. Conditions increasing one or both of these factors such as late picking, light soils, open pruning, and sod culture increase color. Opposite conditions decrease it. Iron applications to the soil have not been shown to improve the color.

Ninth: The average size of apples is governed primarily by the number of fruits on the tree, after the number has passed a certain "critical point." This point is relatively high, the data showing that, even on trees up to fifteen years of age, little or no correlation appeared until the number of fruits reached one thousand four hundred or more per tree. Below the critical point, size can be markedly affected by moisture supply, cultural methods, manures, and fertilizers—especially those rich in potash, and these factors may also cooperate in such a way as to materially raise the critical point.

Ordinary concentrated lime-sulphur has not given as good results in destroying the oyster shell bark louse as the old home-boiled mixture containing more lime made by boiling twenty pounds of lime and fifteen pounds of sulphur in forty gallons of water. The poor results obtained are due to the lack of free lime. The lime acts in the gelatinous matter of the scale, loosening it, and allowing the caustic lime-sulphur to enter and kill the insect. For best results in destroying this insect mix from five to eight pounds of lime with each barrel of lime-sulphur as diluted for application.—W. T. McCoun, Horticulturist, C.E.F., Ottawa.