The 1965 Nursery Soil Improvement Conference

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There are probably very few single simple answers to questions of adequate soil organic and fertility level maintenance. Apart from differences in climate soil among different nurseries, the level of intensity of operation will be a large factor in determining the kinds of problems we will encounter. An example of the changing problems with changing intensity of management is the sheep industry in New Zealand. At low production levels parasites and quantity of feed were the primary problems. With increasing production and the solution of the feed and parasite problems, a whole new set of problems, never before considered, were encountered. Selenium deficiency, magnesium tetany, and facial exzema became problems associated with the new level of intensity.

Nurseries find the same exchange of problems with increasing intensity of management. If nurserymen recognize and subscribe to this philosophy, they will be less troubled when the new problems arise. Nurserymen are continually being pressured to higher intensity levels, whether they like it or not. For instance, low intensity management with its higher mortality rates will not be acceptable when using high cost seed from seed orchards.

With the foregoing as a preface, a discussion of the soil conference and soil fertility problems followed.

1. There seems to be no answer to the question of whether nutrients

applied in excess maybe limiting growth rather than shortages of nutrients. We may expect that under high input systems marginal salt injury may result. Also large application of phosphorus may at some time create copper, zinc or manganese tie-up. Phosphorus is applied at Saratoga only once each 3 or 4 years at about 150 lb/A P_2O_5. This would be equivalent to about 500 lb. of 12-12-12/A/yr. and is not considered excessive.

2. Liming soils to increase availability of phosphorus to offset effects of fumigation phosphorus deficiency does not seem to be a practical solution.

3. Minor nutrients don't seem to be a problem. They are applied in the form of fungicides, organic additives and commercial fertilizers. Boron furnished as an ingredient in commercial fertilizer is generally undesirable on sandy acid nursery soils.

4. A problem in a Pennsylvania nursery located on an old iron furnace site was discussed. It was suggested that a soil sample be run through a spectroscopic lab to detect heavy metal. The possibility of sulfide conversion to sulfate with resulting toxicity was pointed out.

5. As a result of the soils conference, New York has initiated a program of crop logging. It is hoped that this information may help to regulate the nutrient applications. Current practice is the application of 10 lb. nitrogen + 10 lb. K_2O/A/week from emergence + 1 month to 3rd week in September on all 1-0, and on 2-0 being forced for shipping as 2-0. Slow release nitrogen fertilizers have not been generally successful, because larger amounts of nitrogen may be needed than is

being released. The high cost of these fertilizers is a consideration, especially if the large applications suggested at the soils conference by Voigt were made. The frequent application of small doses of soluble fertilizers is the alternative in sandy soils.

6. Organic materials can create nitrogen and phosphorus deficiencies which must be corrected by frequent fertilizer applications. Since phosphorus does not move much in some soils, preplant applications should be made if a deficiency is anticaped.

7. The forms of nitrogen fertilizers is thought to influence tree response to nitrogen. Under controlled conditions, NH_4 form gave the best response. There is some question about how rapidly Urea applied in solution is converted to NH3 or NH4 and whether losses of nitrogen can occur if it is not washed into soil soon after application. Pennsylvania is having better results from a dry application of Urea washed in with irrigation.

During this session, the question of how the various states were Going to find solutions to the various problems brought on by the higher intensity of management was raised. The feeling of the group was that, for the most part, the nurseries could not often solve their own problems, nor could the universities with their heavy teaching loads devote much time to nursery problems. An exception may be the Institute of Applied Research to be established at the New York State College of Forestry in Syracuse. It appeared that most favored the regional approach to these problems, cooperating with the Forest Service, through its nursery specialist.

The group favored the continuation of nurseryman instruction which was started at Syracuse. They also felt that future sessions should be of the workshop variety because of the wide range in the educational levels of a large

number of nurserymen.

The problem of getting fast soil tests and interpretations was also discussed. Several expressed the opinion that the use of agricultural soils laboratories had not been satisfactory for these reasons. It was suggested that the area nurserymen might request a specialized service for nursery soils from one of the Northeastern Area State Labortories.