Chairman Ward: Dr. Stone has presented an extremely provocative talk on seasonal periodicity in root regeneration, and cold storage success affected by lifting time. He has clarified his unique subject matter with many interesting charts and slides. Ed is the first to admit that his work is completely basic research, that he is attempting to develop a basis for standards in the fields of root regeneration and subsequent survival of transplanting seedlings. This work is very commendable and timely in the light of our expanded reforestation programs.

The group then adjourned to the United Churches for luncheon

The meeting reconvened at 1:00 P.M.

Chairman Ward: It would be interesting to note that our meeting is international in scope inasmuch as we have our friends from British Columbia with us. We also have several of our States represented. These people have come by automobile, bus, train and air line. We have one person who is interested in our efforts and yet has such a busy schedule that she is forced to commute by private plane. One of the major problems confronting nurserymen is a correct interpretation of our seed values. Here to help us with this problem is Mrs. Louisa Jensen from Oregon State Seed Laboratory. If you have not guessed, Louisa is the one who is flying her own plane. Her accomplishments always amaze me.

NEW INFORMATION ON SEED TESTING

by
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I used to think I knew I knew
But now I must confess
The more I know I know I know
I know I know the less.
Anonymous

In testing forest tree seeds as in all other branches of knowledge, much yet remains to be learned. However, it is very gratifying to note that at the present time much interest is being shown in this field. There is a new awareness of seed quality in forest tree seeds evidenced by the actions of several interested groups. These include the International Seed Testing Association; The Association of Official Seed Analysts which represents Seed Technologists; The International Crop Improvement Association; and the States of New York, Georgia, Michigan, Illinois and others who are developing seed laws and enforcement measures. Seed handlers and users are expressing greater interest in seed quality. Research scientists, both regionally and nationally, are giving greater attention to forest tree seed research. One of the most active groups is our own Northwest Forest Tree Seed Committee.

Let us briefly review some of the things that these groups are doing:

The International Seed Testing Association in 1954, for the first time, included forest tree seeds in their rules for testing seeds. However, the reference

to forest trees was mainly by genera and with only general conditions for testing. At present a committee is working to suggest more specific rules and include many kinds of forest tree seeds that were omitted in the first rules. Likewise the Association of Official Seed Analysts have a sub-committee which is attempting to develop rules for testing the kinds of trees and shrubs used in commerce in the United States and Canada. The fact that this sub-committee is joint under rules and research shows that there is an awareness of the lack of research on which to draw for establishing rules for testing.

Seed certification at the present time is mainly being instigated by individual States. The Georgia Crop Improvement Association has set up a procedure for certifying tree seeds in Georgia. New York is in the process of developing certification procedures for their State. The International Crop Improvement Association, with representatives from Canada and all States in the United States, has discussed the matter, but to date has taken no formal action.

Law enforcement action on a national scale was postponed because of the action of the Northwest Forest Tree Seed Committee. It was felt that it would be getting the cart before the horse to have laws before we had a means of accurately testing seeds. Some of the States that have a law controlling tree and shrub seed at the present time are doing little enforcement.

Research scientists both in individual State Colleges and the U.S. Department of Agriculture are becoming aware of the studies needed in the physiology of forest tree seed germination. These studies are not alone confined to the United States but some countries such as Japan are also working on such projects.

Cur own Northwest Forest Tree Seed Sub-committee on Standards is preparing tentative rules for testing the kinds of coniferous tree seeds that are used in commerce in this region. No doubt as these are used, as research expands our knowledge, and as measures of quality change, additional adjustments will be needed. The task of preparing tentative rules is not a small one. For instance, one of the problems which must be considered is definitions. A definition expressed in terms which can by reading be interpreted the same by all people is not simple to write. For example, in developing the definition of pure seed, it must be stated whether wings that normally could be removed in processing, if not removed, should be considered pure seed or inert matter. The definition must also clearly state which immature units should be considered pure and which development could be considered inert. There is a possibility that for such seeds as Western red cedar, Sequoia and some others that a standard blowing technique may need to be devised to give uniform and reproducible results in obtaining "pure seed." Such a procedure has

not yet been developed. Definitions for normal and abnormal seedlings must be carefully developed to reflect planting value.

In addition to pure seed and germination other measures of quality are used for forest tree seeds. For instance, the moisture content is very important especially in relation to storage. Cereal chemists have worked out very exacting standards and procedures for obtaining moisture content in cereals. However, determination of moisture content in forest tree seeds is complicated by the presence of volatile oils and resins which will vaporize at the temperatures used for moisture tests of cereals. Therefore, special techniques need to be developed and standardized for both basic and practical methods of determining moisture content. Because

"Quick Tests" such as staining with tetrazolium chloride and the use of hydrogen peroxide have a definite place in measuring quality of forest tree seeds. The weight of 1,000 seeds from which the number of seeds per pound is calculated is another measure of quality that is used by nurserymen. Here again the cereal people have developed an electronic seed counter for counting cereals. With proper modification this may also be applicable to forest tree seeds. Vigor is another field of evaluation that has hardly been explored except for the use of the cold test for corn.

The Northwest Forest Tree Seed Committee also has a sub-committee giving guidance to research and coordinating the projects between different agencies. Research may eliminate many of the testing problems that develop from handling of seeds or cones. For instance, when we know the range of temperature that is safe for cones and for seed storage, when we eliminate all mechanical injury in processing, and when we develop proper use of fertilizers, many of the tasting problems that now must be met may be eliminated. The new awareness of seed quality and the increased knowledge of why seeds behave like seeds, makes the future look bright for nurserymen to predict field performance more accurately.