Defense of Tropical Forests Planned

Forestry

International Experts Seek to Forestall Plant Disease

PLANS for protecting the great tropical forests of the Americas from careless exploitation, such as has laid waste the forest sections of other parts of the world, were discussed at the meeting of the first Inter-American Conference on Agriculture, Forestry and Animal Industry in Washington. The conference was attended by representatives of all of the 21 American republics.

Forest land in the 20 Latin American republics is estimated to cover an area of 3,000,000 square miles, which is larger than the total area of continental United States exclusive of Alaska, William R. Barbour, forester of the Tropical Plant Research Foundation said. So little research has been done in these forests that only vague guesses can be made as to the volume of standing timber in them. A safe estimate places it at at least six thousand billion board feet.

"Too little is yet known about the forests of tropical and subtropical countries," said W. T. Cox, consulting forest engineer of the Tropical Plant Research Foundation. He urged extensive forest exploration aided by airplane, so as to get not only botanical information of the numerous trees but also commercial classifications. Training of young men in forestry and the development of these vast forests along scientific principles were advised.

"In the two Americas constructive forestry is still in its beginning," said Dr. E. P. Meinecke, plant pathologist of the U. S. Department of Agriculture, Bureau of Plant Industry. "The nations of the two Americas have a common interest in building up their forests for the benefits of coming generations and to this goal the protection of the forests against disease is one of the most promising and essential conditions."

The greatest menace from killing forest epidemics has come through the accidental introduction of forest diseases. The science of forest pathology, which would take care of these disease conditions of trees, must be organized on international lines in order to find its true place in modern forestry, he declared.

The danger of looking for temporary reward rather than for ultimate benefit in the cutting down of forests and development of the land for other purposes was described by Prof. D. M. Matthews of the University of Michigan School of Forestry and Conservation. The reckless waste of trees which results from using the land for other purposes is not the only evil. The removal of the forest cover may have a bad effect on the productive capacity of other permanent agricultural areas in the region, he pointed out. This is too frequently overlooked in the clearing of land.

Other speakers emphasized the need of studying the little-known woods of these forests with a view to their possible uses in future decades when both Latin American countries and the United States will have to turn to these forests for most of their lumber.

Dread Soil Erosin

The sinister scourge of soil erosion, which in this country has already destroyed enough land to support a nation, was described by H. H. Bennett of the bureau of chemistry and soils, U. S. Department of Agriculture.

"Not less than 126,000,000 pounds of plant food are being washed out of the fields of America every year," Mr. Bennett said. "Something like 17,500,000 acres of land that were formerly cultivated in this country have been destroyed by gullying or so severely washed that farmers can not afford to attempt their cultivation or reclamation. This is enough land to support a nation. It exceeds the total area of arable land in Japan."

An even vaster area of land has been injured by sheet erosion. This is a slower process of erosion, as distinguished from gullying, which removes a film of soil from entire fields whenever it rains enough for water to run downhill. Erosion operates chiefly on topsoil, the most productive part of the land. This is the humus layer, that vital part of the soil from which plants get their principal nourishment. When it is washed off, clay subsoil is generally exposed.

Mr. Bennett described some of the areas in various parts of the country where as much as 40 inches of soil has been lost through erosion since the land has been under cultivation. In some places land has been washed away to the underlying rocks.

Removal of trees from the slopes, destruction of prairie grasses by tillage, and disturbance of ground stability by plowing, overgrazing, excessive burning, freezing and thawing have resulted in this intensified soil impoverishment.

Cropping schemes, construction of terraces, soil-saving dams and vegetative obstructions are some of the means of reducing the evils of soil erosion, Mr. Bennett said. These have been tried in different sections of the country, particularly the south and west, and good results are already being reported.

We are not yet on the verge of a land shortage but we are getting closer every year to a shortage of good land. Much of the losses already revealed by an expert survey can be reduced but the problem must be vigorously attacked at once.

A tremendous amount of awakening among farmers, landowners, bankers, merchants and others, to the seriousness of the problem is necessary, as well as a vast amount of research and demonstration work, Mr. Bennett said.

In regions where some of the land-saving measures are already being tried, it has been found that both the quantity and quality of the crop has improved. In the cotton crop, for instance, it was found that uneroded land, that is land which had not lost its topsoil, produced more lint cotton per acre, more seed, and the seed itself yielded more oil. Since cotton-seed may be bought on the basis of oil content in the near future, this last is considered an important discovery.

Nature Fights Disease

The very best method in the control of plant diseases is probably Nature's method of control through selection and breeding of resistant species and varieties, Dr. Merton B. Waite of the U. S. Bureau of Plant Industry said at the Conference.

"One of the most striking things

in plant pathology is the development of disease control methods based on scientific research," he continued. Most of these methods have been developed within the last 50 years, many within 25 years. These include spraying and dusting with fungicides, disinfection, eradication, control of the carriers, sanitation, cultural and handling methods, breeding and selection of resistant species and varieties, and quarantines. Spraying has become one of the leading methods in spite of the expense and trouble which it entails. The practice of quarantine regulations makes it reasonably certain that new plant material may be introduced into a country without introducing diseases.

The loss through insects and plant diseases in the United States each year amounts to $3,000,000,000, Lee A. Strong of the Plant Quarantine and Control Administration, U. S. Department of Agriculture, reported to the Conference.

"Fully 50 per cent. of the important pests responsible for this enormous loss are of foreign origin, practically all of them having been introduced prior to the passage of the Plant Quarantine Act of 1912," he said. He explained the authority under which these quarantines are carried out and how they operate.

Comparatively little is known of the insect problems of South America, Dr. W. Dwight Pierce, entomologist, formerly of the U. S. Department of Agriculture, said. It would take a long time and many men to make a complete survey of the insect life of the Americas. Consequently he suggested that the Pan-American Union or the Tropical Plant Research Foundation maintain a small staff of specialists in the various branches of agriculture, including entomology, who will be constantly available to the various countries to make surveys of the more important economic problems and to give practical advice.

Death to Weeds

No short cuts or easy methods exist for controlling the weeds which cost farmers of the United States several hundred million dollars each year, M. W. Talbott of the U. S. Bureau of Plant Industry told the delegates.

"In the main, the old doctrine of hard work and plenty of it must be observed," he said. "The three main methods of weed control are: prevent weeds from maturing seed; prevent the introduction of weed seeds; and prevent perennial weeds from making top growth."

For the first method he advised tillage, mowing and pasturing with livestock. The second is more difficult and often requires comunity action to keep down the introduction of weed seeds. For keeping down the top growth of perennials, he recommended clean cultivation, smother crops, pasturing, frequent cutting and the application of chemicals. This last must be done with care, however.

Successful Tick War

The success of a 24-year war against the cattle tick, cause of the costly animal disease known as southern Texas or tick fever, was reported by W. W. MacKellar of the U. S. Bureau of Animal Industry. "It is possible and practicable to eradicate the cattle tick permanently from any section," Mr. MacKellar declared.

When this eradication project was started in 1906, 983 counties with a total area of 728,565 square miles were under Federal quarantine because of tick infestation. At the close of 1929 the quarantined area had been reduced to 184 counties containing 151,198 square miles.

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Man's Efforts to Fly Straight Up—*Continued*

Since the World War there has been no want of helicopter inventors and trial machines. They are found in nearly every country. Even if such craft must be tied down with a rope, it has been learned that they are often better for observation purposes in war than captive balloons. They cannot be seen from a great distance, are small targets and require few men in their ground crews.

Among other helicopters which have been the subject of extensive research during the past decade is one developed by Louis Brennan for the British government. Great secrecy surrounded its building and tests.

In America both the de Bothezat and the Berliner helicopters are said to have made short flights. The de Bothezat machine had four propellers arranged radially on the same level over a framework to which the engine was fixed.

Dr. Berliner and his son, Emory A., of Washington, built a machine which made use of an airplane fusilage. But instead of wings there were two propellers which turned in opposite directions to lift the machine vertically. Horizontal motion was gotten by means of a three-foot propeller near the tail of the ship to tilt the entire machine by raising and lowering the tail.

Marquis Pateras Pescara has used two propellers, one above the other, rotating in opposite directions. He is reported to have remained in the air more than eight minutes and to have flown over 3,000 feet in Paris early in 1924.

A German engineer, Englebert Zaschka, has designed a helicopter in which a gyroscope is used to increase stability. It also serves as an energy accumulater for a gliding flight. Gliding flight is this case means a straight descent.

While many engineers were seeking vertical flight directly, Juan de la Cierva, a young Spanish scientist and former member of parliament, decided to make a cross between a true airplane and a true helicopter. In effect, he stripped the wings from an ordinary biplane and erected above the ship four windmill blades which turn in a horizontal plane and are free to move at will, being connected to no source of power.

When he tested his machine in 1923 he found he had a ship that would not remain stationary in the air, but it would travel very slowly indeed. He could throttle it down to 20 or 30 miles an hour. It would not climb straight up but it would rise at a very sharp angle, much sharper than that at which airplanes ascend.

In Italy Signor M. Isacco has apparently attempted to convert the autogiro into a helicopter. He calls his machine the helicogyre. A casual examination shows it to be an autogiro with small motors built in the revolving wing tips. This makes the rotating wings independent of the backwash of the propeller for their motion.

The newest helicopter, the Curtiss-Bleecker machine, is the invention of Maitland B. Bleecker, who began to plan his machine when a student at the University of Michigan.

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