



TIME WARP 1960

Introduction

Forests provide many resources to society. To provide these resources, forest managers are continually working on tree improvement. Tree improvement is the process of growing trees with the best wood for human uses in the shortest time. Tree improvement has been an important topic for forest managers in North America. However, tree improvement was not always a common research topic in tropical forests.

In 1960, Forest Service scientist F. Bruce Lamb began working on tree improvement for tropical forests. Lamb was interested in mahogany trees. At the time, scientists knew about three different mahogany tree species. Scientists had observed information about how each mahogany species was similar and different from one another. One of the three species was big-leaf mahogany (figure 12).

As you learned in “Standing on the Shoulders of Giants,” mahogany trees are an important source of wood. Lamb knew that scientists needed to continue growing high-quality mahogany trees to meet the demand for mahogany wood for society. The scientist in this research asked: What are the steps that scientists need to take to start mahogany tree improvement programs?

Figure 12. In this photo, you can see a big-leaf mahogany plantation from 1949. When the photo was taken, the plantation was 11 years old.

Photo by Frank H. Wadsworth, courtesy of Grizelle Gonzalez and Marinelis Talavera, USDA Forest Service.





Methods

To answer the question about tree improvement programs, Lamb collected information from other scientists. Scientists write scientific papers to tell other scientists about their research (figure 13). Lamb read many papers regarding the mahogany research of other scientists. As you read in the “Time Warp” Introduction, little information was available regarding tree improvement in tropical forests in 1960. Lamb used information from other tree improvement programs and tried to apply it to existing information about mahogany trees.

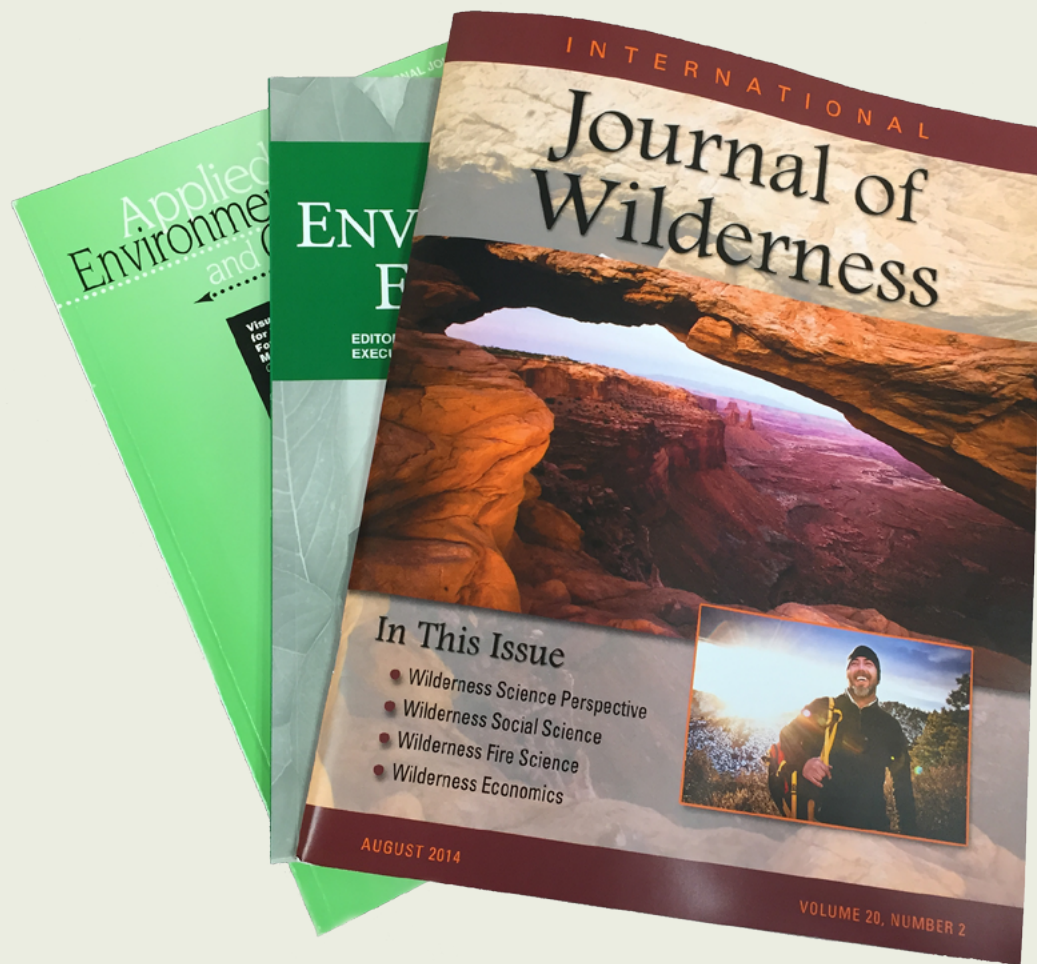


Figure 13. Scientific papers are published in scientific journals focused on a specific topic.

Photo by Brian Cooke, used with permission.

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Reflect and Connect



Scientists in both “Time Warp” and “Standing on the Shoulders of Giants” were studying similar topics. However, their research was separated by more than 50 years. Why do you think scientists revisit questions that have already been studied? What can change over 50 years that might help scientists’ understanding of a topic?



Findings

Lamb determined that four steps were needed for a mahogany tree improvement program. First, he recommended that scientists improve the understanding of how the three mahogany species differ from one another. This step could include tests for similarities or differences that were observed by the scientists (figure 14).



Figure 14. In this photo, you can see scientists in 1936 working with big-leaf mahogany seedlings in a nursery. Scientists may observe or test trees in a nursery to understand more about them.

Photo courtesy of Grizelle Gonzalez and Marinelis Talavera, USDA Forest Service.

The second step includes finding and selecting the best qualities available within the three mahogany species. This step could be done using observations or experiments. Observations enable scientists to select seeds from trees that they believe have the best qualities, such as a high growth rate. Experiments enable scientists to plant mahogany seeds under different environmental conditions. From this process, they can discover which trees grow best in a particular location and which trees are least affected by disease.

The third step is the development of a pollination program. Pollination is the process in which pollen lands or is placed on a flower, which causes the seeds of the plant to develop. In a pollination program, the scientists can choose which plants are pollinated. They try to combine the best characteristics of two plants into one, called a hybrid. The fourth step recommended for scientists was to follow changes in mahogany wood use.



Discussion

Using information from other scientists and an understanding of mahogany trees, Lamb was able to create four steps for a mahogany tree improvement program. However, he was not sure if all the steps were possible. He concluded that step three, a pollination program, could be difficult, especially if done on a large scale.

He recommended that scientists work on future studies to determine if this step would be possible. Overall, he concluded that the fourth step, following trends in the use of wood, would be important to help scientists plan their research on mahogany tree improvement.

What Has Happened Since This Research Was Done?

In 1960, big-leaf mahogany was plentiful in Central and South America. Lamb encouraged others to use a process for studying and growing the best mahogany trees. However, the wood of big-leaf mahogany was

more popular during the mid-1900s than other mahogany trees. Many companies harvested the trees using a process known as logging (figure 15). Some companies harvested trees without a plan.



Figure 15. Trees being harvested during a logging operation.

Bureau of Land Management photo.

As you read in “Standing on the Shoulders of Giants,” scientists and governments decided to put big-leaf mahogany on the CITES list. The list is an agreement to protect plant and animal species from becoming extinct. Countries that buy and sell big-leaf mahogany wood work together to help the species. These countries try to control illegal trading of the wood. These countries also support forest managers who sustainably manage big-leaf mahogany trees on their land.

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Reflect and Connect

Based on what you learned in “Standing on the Shoulders of Giants,” do you think scientists have succeeded in growing and protecting mahogany trees? Why?

Adapted from Lamb, F. Bruce. 1960. An approach to mahogany tree improvement. *Caribbean Forester*. 21:12-20.