

The Making of a Cooperative Forestry Program

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Abstract

Forestry cooperatives have the objective of accomplishing a goal by group, rather than by individual effort. Ingredients for a successful cooperative include enthusiastic leadership and committed clientele. For the Cooperative Programs at North Carolina State University, all cooperators are treated equitably, regardless of size, age, or state of knowledge, to operate at a defined threshold level of activity, and all are required to share research results and plant materials with other cooperators. Research results are made available to the public with minimal delay. Continuing education is an essential part of any successful forestry cooperative.

Introduction

Forest tree improvement programs are complicated by the long time required for trees to reach sexual maturity; the long reproductive cycle, which extends through two years for most conifers; and the long time required for the resultant progeny to reach financial maturity. In addition, the logistics of consummating controlled crosses and obtaining seed and scion material from mature trees that range to 50 meters tall are restrictive. The time, effort, and finances required to conduct such a program on a scale to produce improved plant material for operational use while maintaining a broad genetic base for future cycles of breeding are generally prohibitive for all but a few public organizations. Even those organizations lack the alacrity to accomplish both short- and long-run objectives. The alternative is to accomplish the job by group effort, rather than by individual effort.

Note from the Managing Editor: This paper was presented almost three decades ago with the precise purpose of making it clear how forestry benefited from cooperatives. It is a remarkable reminder of how far we have come as a result of forestry cooperatives with some good thoughts on how cooperatives can keep forestry strong in the future. Reprinted with permission of the author, who is now retired.

The group effort for genetic improvement of forest trees was envisioned by Dr. Bruce J. Zobel in 1951. Employed as a silviculturist by the Texas Forest Service, Dr. Zobel organized a coalition of southern forest industries to fund and conduct the necessary research for formation of an operational tree improvement program. Reliance on private industry to accomplish the job was as surprising then to the South as it is now to other regions within and outside the United States. Antagonists were convinced that public agencies were the only organizations suited to conduct long-range research, and they were equally convinced that the private industry was too fickle for long-range commitments. How could private organizations of a strongly competitive commodity group organize to accomplish a common goal? The structure and accomplishments of the North Carolina State University-Industry Cooperative Tree Improvement Program, with frequent reference to other forestry cooperatives, are recounted to answer that question.

Cooperative Defined

A cooperative is defined as a means of working together to achieve a common goal. That loose definition has allowed extension of the principle to mean involvement from the least to the greatest degree. Farmer alliances are examples of the lesser degree of cooperative involvement. For a fee, which is usually exacted from the selling price of the commodity, the farmer can deliver his tobacco, corn, or cattle to the cooperative, which assumes all responsibility for selling to the processor. Better prices and greater assurance of selling are the rewards of the cooperative effort, in which the farmer usually has no investment. He is involved only to the degree that he commits his crop to the venture.

The end opposite farm alliances on the spectrum of cooperatives is total involvement of all members in all activities. Added stipulations are that all members be treated equitably, regardless of size, state of knowledge, or longevity, and each organization be required to perform at a threshold level. Anyone failing to meet these standards would be declined admission or purged. It is the latter type of organization to which we will address our attention.

Cooperative Perceived

A forestry cooperative works best when the need for the joint effort is perceived by its potential members. The succeeding step is presentation of the proposal to a number of public agencies or foundations to determine who has superior capabilities for administering the project. Being involved in the decision to house the project within a specific agency induces harmony among the cooperators.

Successful forestry cooperatives also exist as a result of an enterprising person or group of people convincing the clientele of the value of a combined effort. In the beginning such cooperatives almost always attract fewer cooperators than anticipated. The result is to increase the fee structure of member organizations to form an acceptable operating budget or to operate on a reduced budget. Neither option is attractive; member organizations express lack of confidence in the first instance, and results are slowed in the second instance. The only way such a program can succeed is by accomplishment. A degree of respectability is gained when results are obtained; failure results when they go begging.

A variant of the joint effort perceived by potential members is additional funding of a project already in existence. Support by a couple of organizations that first recognize the value of the research often serves as a catalyst for contributions by other organizations until a full-fledged cooperative is formed. The Herbicide Cooperative at Auburn University, Alabama, is an example of such a success story.

Cooperative Ingredients

Successful forestry cooperatives need not be formed to the same mould. Greatest differences are in the authority vested in the directors. Some directors are given broad control, whereas others have to operate within the confines of committee action. I espouse the broad control method because it has been used successfully by the Tree Improvement, Hardwood Research, Forest Fertilization, Forest Equipment/Systems, and Tissue Culture Cooperatives at North Carolina State University. The method presupposes that the director is the expert on the subject and that his judgment is valued over that of a committee, each member of which knows relatively less about the subject than the director.

Justification. Major reasons for support of cooperative programs by forest industry in the South are diversity of land ownership and time, cost and effort of conducting long-range research. Most organizations supportive of co-

operatives own or control from 80,000 to 2,000,000 ha of land. Within an ownership, the land extends across several geographic provinces, many states, and a multitude of site productive classes. The diversity prohibits the intensity of research needed for each classification, even for those organizations with a large support staff. The philosophy is that a coordinated effort by a group of organizations can accomplish more in a given time at a cheaper cost than can each of the organizations working separately.

Coordinator. In order to render impartial decisions, it is imperative that the coordination of a cooperative forestry program be vested in an institution distinct from that of its members. Forestry schools within major universities have commonly filled these roles in the South, although the U.S. Forest Service has coordinated cooperative programs in pollen management, lightwood production, and introduction of *Eucalyptus* (table 1).

Requirement. The North Carolina State Tree Improvement Program operates without a contract of any type. Initial verbal agreement was to support the program for five years, after which time the cooperators were free to withdraw if unsatisfied with results. The director was also given authority to terminate membership if a cooperator did not perform to a threshold level. Some cooperatives also discourage renewed membership of organizations who terminate participation at periodic intervals. Nothing is more damaging to a cooperative program than a member who benefits at the expense of other cooperators. An unqualified stand against such practices has resulted in the North Carolina State Tree Improvement Program's growing from 10 members in 1956 to 30 members in 1979 without a single casualty.

One of the greatest benefits of a tree improvement cooperative is the amassing of a genetic base that would be almost prohibitive for any one organization to amass. Free exchange of the plant material then becomes imperative if the cooperators are to benefit from the best genetic material. It is not common in the Tree Improvement Program for a clone of outstanding genotype to be found in the seed orchards of a half-dozen cooperators, and progeny from an outstanding clone in Virginia are likely to be under test on lands of a separate cooperator in Mississippi.

Another major requirement of the Tree Improvement program is that all information obtained through the auspices of that program will be made available to all other cooperators without delay and to the public as soon as the

Table 1. Cooperative forestry programs in the South, by state and institution.

State	Institution	Cooperative type
Virginia	Virginia Polytechnic Institute and State University	Biometrics
North Carolina	North Carolina State University	Tree improvement
		Hardwood silviculture
		Forest fertilization
		Forest equipment/systems
		Tissue culture
Georgia	University of Georgia	Biometrics
Florida	University of Florida	Tree improvement
		Forest fertilization
Alabama	Auburn University	Herbicide evaluation
Mississippi-Louisiana	Mississippi State University and Louisiana State University	Harvesting systems
Texas	Texas A&M University	Tree improvement
		Hardwood silviculture
	U.S. Forest Service (Southeastern Forest Experiment Station)	Pollen management
		Lightwood induction
		<i>Eucalyptus</i> introduction

information can be disseminated in oral or narrative form. In the 23 years the Cooperative has been in existence, the rule has rarely been challenged. Most cooperatives follow the principle of the Tree Improvement Program in disseminating results. However, some programs delay dissemination of the information for a time not to exceed two years, to allow member organizations to profit from the results.

It is a requirement of the Tree Improvement Program that all trees grafted into seed orchards will have been graded by the program staff. The other stipulation is that the experimental design of progeny tests and other region-wide field trials be common among all cooperators. The former requirement assures a common base for genetic improvement of the southern pines, and the latter one adds efficiency to data collection, analysis, and interpretation. Most other cooperative organizations of a similar nature have similar requirements.

Although the absolute requirements of the Tree Improvement Program are few, advice and recommendations are freely given on topics ranging from orchard establishment to deployment of genetically improved plant material. The technical representative is free to reject our counsel, but he and his superiors are reminded that we assume no responsibility for failure if our advice is rejected. We are quick to admit failure when we have given a wrong recommendation, but are just as quick to disclaim responsibility when the fault lies with the cooperator.

Qualification. Cooperative forestry programs require long-term commitments of money and manpower. The amount of money contributed to the coordinating unit is small in comparison to the expense of establishing and maintaining research and operational trials on cooperator lands. The cost to a single cooperator in tree selection, orchard establishment, progeny testing, and collection and deployment of plant material in the Tree Improvement Program is up to 40 times that allocated to program coordination. That consideration has caused us to recommend against membership of any organizations controlling less than about 80,000 ha of land. Such organizations are advised to support the programs of their respective state forest services, from which genetically improved plant material can be obtained.

The Tree Improvement Program was formed with the sole support of forest industry. That policy was subsequently changed to allow participation by state forest services. The Forest Service of Virginia, North Carolina, and South Carolina are now among the 30 members of that program in which all participants are treated equally. The forest services of these and other southern states, as well as the U.S. Forest Service, also support one or another of the various cooperatives listed in table 1.

Trade associations and commercial enterprises without a land base, which would benefit directly from cooperative membership, are discouraged from joining except as a

patron. Membership is generally decided on the recommendation of the director, with final approval being the responsibility of the advisory committee.

Administration. With the implicit approval of the cooperators, a director is appointed by the coordination organization, such as the university where the cooperative is housed. The director is responsible for composing a staff of the quality and quantity needed to conduct the business of the cooperative.

Contact between the director and the cooperator is made at two levels for most cooperative programs. The administrative contact is made through the advisory committee, which is composed of one administrator from each cooperator. The administrator has sufficient authority to make policy decisions regarding cooperative matters. Contact is maintained with the advisory representative throughout the year, and an advisory committee meeting is held annually, at which time a report is made to the director on accomplishments and plans and on financial status of the cooperative. The advisory committee interacts with the director on these matters.

The second level of contact by the director and the cooperator is with the technical representative. The technical representative, generally a graduate forester with a baccalaureate or master's degree, is responsible for cooperative activities of the cooperator. Although an employee of the cooperator, his duties are largely influenced by directives of the cooperative. Annual meetings are commonly hosted by the cooperators on a rotating basis to allow the technical representative to show his accomplishments and to see the accomplishments of his peers. Superiors of the technical representatives are excluded from these meetings to allow latitude in discussion.

Finances. Financing of a cooperative program is usually jointly funded by the cooperators and the coordinating unit. The cooperatives at North Carolina State University enjoy the use of the capital plant, inclusive of facilities without the cost of overhead. The salary for the director, or an equivalent amount of money, and costs for associated goods and services are borne by the university. Monies collected from the cooperators on a scheduled basis are used for salaries of the support staff and graduate students and for goods and supplies for day-to-day operations. Cooperator fees are self-imposed at the annual meeting for the following year, based on the budgetary process.

All organizations are generally charged a single fee, regardless of their size or status. An exception to that rule occurs when an organization has separate operations at locations separated by more than about 500 kilometers. The policy is to charge the set fee for the base unit of that organization and to charge a reduced fee for each supplemental unit. The rationale for charging a constant fee for all base units is that a similar amount of time and effort is required to service one organization, regardless of its size. Smaller organizations are content to pay the common fee because it assures them of the same attention received by an organization several times their size.

Cooperator fees for program coordination are small compared to the expenses of tree selection, orchard establishment, orchard management, progeny testing, and deployment of seed on cooperator lands. The annual fee for the base unit of many cooperatives does not exceed \$5,000. However, the industrial contributions have served as a catalyst for obtaining other monies. Some granting agencies find expediency in awarding a grant to an organization having matching monies, especially when the matching monies are of industry origin. We at North Carolina State University have received sizable grants from National Institutes of Health, the National Science Foundation, the U.S. Department of Energy, the Ford Foundation, the Rockefeller Foundation, and the National Space Administration. The monies are used to complement or extend cooperator funds.

Coordination. The major function of a cooperative program is coordination. The position is comparable to director of research for a large industrial concern. The key is to produce results today while planning for tomorrow. This task is difficult to accomplish during the maiden years of a cooperative, but it is one that nevertheless has to be accomplished. The study of wood among and within species of southern pines was chosen to fill the void in the Tree Improvement Program. That vocation melded well within the Tree Improvement Program when the larger effort began to pay dividends. For those initiating a cooperative program, many subjects allied to forestry and of equal importance to the study of wood properties await investigation.

In addition to coordination, psychology has to be practiced for development of a successful cooperative. A case in point for the Tree Improvement Program is the establishment of separate seed orchards on the land of each cooperator. A more efficient alternative would have been

to establish one or a few orchards for production of genetically improved seed for all cooperators. The need for each to have separate orchards to show accomplishment and pride in their work was soon recognized. Some efficiency may have been lost, but the public relations gained from the dispersed operation have paid dividends many times over.

Coordination of a cooperative program cannot easily be accomplished without knowing what is transpiring in the profession and on cooperator lands. That accomplishment requires a tremendous amount of travel for the staff of North Carolina State Cooperatives, whose membership ranges throughout a 13-state area. Policy visits to each cooperator are made at least annually, and service visits for tree grading, grafting, pollination and progeny testing are made as needed. Participation in symposia within and outside the region also claims a significant amount of time. However, we are convinced that the contact maintained through the travel has been a large part of the success of the cooperatives.

Continuing Education. The incentive to house the administration of a cooperative program within the forestry department of a major university is twofold in addition to the university's being independent of the cooperators. These incentives are (1) ability to draw on expertise from closely allied disciplines, and (2) involvement with graduate and undergraduate education in the field of interest. At North Carolina State University, close contact is maintained with the disciplines of botany, biochemistry, entomology, genetics, horticulture, pathology, physiology, soils, and statistics, as these subjects interact with tree improvement objectives. From 12 to 15 graduate students pursuing Master of Science or Doctor of Philosophy degrees in forest genetics are annually associated with our Tree Improvement

Program. Research conducted by the candidates has been instrumental in successful development of the operational tree improvement program. Graduates of this program are found in positions of influence and authority throughout the world; many of them are supervising the maturation of a second generation of forest geneticists.

A necessary ingredient of a successful tree improvement program is emphasis on continuing education. In addition to one-on-one instruction given for tree grading, grafting and progeny testing, short courses of about three days' duration are given to the technical representatives at least biennially and more often if needed. The objective of the short courses is to demonstrate tree improvement techniques and the theory behind these techniques. This effort does not substitute for a basic education in forest genetics principles; it is supplemental to the basic education.

Conclusion

The melding of many ingredients is necessary for the successful development of a forestry cooperative. The case study described for the North Carolina State-Industry Cooperative Tree Improvement Program has been successful for conditions in the southern United States. The same type of success may not be claimed in other regions of the world where differences exist in objective, environment, personnel, and political persuasion. A different melding of ingredients will probably be needed for each condition. Regardless of circumstances, however, two ingredients appear paramount to the success of any forestry cooperative. They are enthusiastic leadership and committed clientele. Without these attributes the cooperative venture is doomed to failure.