

Some Farm Forestry Research Problems

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FARM forests occupy an important place in the forest economy of our country and make substantial contributions to the income of farmers. Nevertheless, as a whole, these forests are producing much below capacity. Of the 461 million acres of commercial forest land in the U. S., 30 per cent, or some 139 million acres, is in farm ownership; yet this farm forest area contains only about 16 per cent of our saw-timber stand in spite of the fact that it includes some of the most productive land available. Some 72 per cent of the farm forests is not managed and another 17 per cent is extensively managed; each is returning only a fraction of its potential yield. If these forests are to contribute their full share to farm income and assist in the development of a healthy forest economy, they must be put in shape and placed under intensive management.

Farmers generally do not have the technical knowledge to enable them to intensively manage their forests. Because most farm woodlots are small, the hiring of a technically trained forester is not justified. The pattern which is apparently developing for the management of farm forests is one in which the state and federal governments cooperate in furnishing advice and direct aid to farm owners. The legal basis for federal participation in such a program is furnished by the Clarke-McNary Act of 1924 and the Norris-Doxey Act of 1937.

Many farm foresters now working in the several states under joint federal-state sponsorship are finding that they do not have the technical information necessary to guide the development of farm forestry. For a number of reasons the procedures developed for large forest tracts do not always fit the small woodlot. The difficulty of finding good markets for small quantities of forest products in agricultural communities, the use of part or all the forest product on the farm, the necessity of integrating farm forestry operations with other farm activities, the fact that forest and agricultural use appar-

Fig. 1.—This young 35 year old cottonwood stand in central Iowa contains 26,000 board feet per acre of lumber.

Photo by U. S. Forest Service



ently often conflict on the same area and the special nature of some of the farm woodlot management problems are all contributing factors.

To assist in the development of sound farm forestry a program of practical research is needed. Farm foresters desire information that can be developed by research and a program of the magnitude needed to get results is now beginning to take shape. The purpose of this paper is to point out some of the types of problems to which solutions are urgently needed if farm woodlots are to be brought to full production and all farm land is to find its best use. Emphasis is placed on problems that appear of major importance in Iowa and similar surrounding areas.

One important job of a farm forester is helping farmers find the best markets for their forest products. Frequently the best market is right on the farm, because the owner thus saves the difference between his selling and buying prices minus the cost of processing which often includes much of his own labor. For Iowa, information regarding all possible local or statewide markets is not now available. A practical survey-research project would be compiling a list of the markets for forest products. Such a list would give names and addresses of all persons or companies using forest prod-

ucts, the products made, the species of wood and amount used, the present source of raw materials and the possibilities of substituting local woods if available in sufficient quantities.

When investigating local markets foresters often have found that manufacturers used woods shipped in at considerable expense from distant points when local species would have served just as well. Local woods were not used because the supply coming from many small operators was uncertain. The development of good local markets for forest products under such conditions will probably require the establishment of concentration yards, either privately or cooperatively owned, to which forest products can be brought, sold and concentrated in sufficient quantity to yield a steady supply to local manufacturers. The establishment of such yards constitutes an action program, yet within an important producing area federal and state agencies could establish and operate such a yard on a pilot plant basis for the purpose of ascertaining the nature of the problems involved in their operation. Such operation would constitute important practical research, the results of which would be valuable in establishing other yards and in selling local industries on the use of locally grown woods. The establishment of other concentration yards could be aided by field surveys showing logical locations for such yards based on the area of forest, quantity of raw materials of various species, and the market requirements within specified "wood-shed" areas.

A third important problem requiring solution concerns the best farm use of the products of local timber species. In the farming community wood is used in a great variety of ways, but the demand is often set by long held prejudices and by price and supply relations no longer valid. For many farm needs products from locally grown woods undoubtedly would prove satisfactory in performance and cost if properly processed and placed in use under the right conditions. In Iowa cottonwood is an important species because of local availability in all sections and because it is the fastest growing and highest yielding tree in the state. Although cottonwood has many desirable properties, there is widespread prejudice working against its general use. Research is needed to determine what are and what are not proper uses of cottonwood and other locally important woods, and how these species can be processed to make them most useful.

Throughout the central hardwood forest, and especially in

Iowa, farm forests are extensively pastured by cattle, horses and sheep. While regulated grazing is compatible with continuous timber production in the coniferous forests of the west and south, such is not the case in the central hardwoods. Farmers often use all their open land for cropping in an attempt to boost cash income and have no areas other than woods in which to run livestock; or frequently they do not appreciate the relatively high timber values and the low pasture value in their woodlots and either do not maintain or do not have fences between pasture and adjacent woodlots. In most cases farm owners would be well advised to keep grazing and wood production uses separated. In practice this may mean dividing a pastured woodlot into two areas, one of which is developed into the best of possible pastures, the other into the best possible woodlot; or it may mean developing the entire area as a pasture or as a forest.

There are several phases to the problem of the pastured farm woodlands. Probably the most important is the problem of land use. Research is needed to show what net return will be realized from certain classes of land, unsuited to crops, when they are developed for pasture or developed for forest production. A second phase concerns the yields of forage, beef or milk, and wood from grazed woodlands of all classes and condition, and how production of these items is affected by changes in site and in stand composition and density during grazing.

Research is needed also to show how existing woodlots, many of which are in very poor condition and producing at only a fraction of capacity, can be converted to maximum yield in the shortest time and at least cost in terms of income lost. Because of the variety in types, size and age classes, condition classes and forms of forest, this problem has innumerable facets and will require many years of detailed experimentation and record keeping. During the conversion period an especial effort should be made to explore all possibilities of increasing the annual return to the farmer, because he often will not live to see the final reconverted product and his interest will wane without annual or periodic monetary stimulation. The complete use of the larger low grade trees and the small trees removed in improvement cutting is indicated.

Farmers also need to know what their woodlots will produce for them when they are in first class condition. Information is needed for all types and sites as to yields and returns

probable under good management. Such information should be useful in selling farmers on good woodlot management and it is basic to proper land use.

In woodlots now in good condition we need to know what results can be expected from various systems of silvicultural management. Because farm woodlots are small and it is desirable to keep them reasonably well stocked at all times with some mature and near mature trees, and because an owner's interest would wane in the long intervals between successive cuts, systems of cutting, such as seed tree or clear cutting, which remove most or all of the trees at one cutting, are generally ruled out. Probably some form or modification of the selection system of cutting, especially if adapted to the requirements of medium tolerant trees, holds most promise. The possibility of adapting the shelterwood cutting to farm woods should not be overlooked. A related problem concerns the frequency of cuts on a given area. Should they be annual, biennial, at five or ten year intervals, or what? Research areas need to be established in the principal types where information can be obtained regarding best cutting practices for maximum yields of desired products.

In the western and northern parts of the central hardwood region and in the prairie and plains areas windbreaks are very important in farm life. There is a great need for exact information regarding the effects of windbreaks, the dollar and cents benefits to be derived from them, and best methods of establishment and care. Primarily we need to know how wind velocity at different locations within the zone of influence is affected by windbreaks of varying species, spacing, number of rows, size and shape. True, considerable information is available, but it is inadequate. Recently Bates¹ has published valuable data on the relation of wind velocity to heat loss and use in houses and has shown that a 40 per cent reduction in wind velocity results in a fuel savings of about 25 per cent. Most farmers think windbreaks are of greatest value in livestock protection and we urgently need data showing relationships between wind velocity, heat loss, gain or loss in weight and feed requirements of livestock. The exact value of windbreaks in preventing snow blowing and drifting, in making the farmstead area more liveable and increasing work efficiency, and the effect on the growth factors and on crop yields are other points needing attention. Inasmuch as evergreens

¹Bates, C. G. Shelterbelt Influences. II. The value of shelterbelts in house-heating. *Jour. For.* 43:176-196. 1945.



Photo by U. S. Forest Service

Fig. 2.—A log yard at Amana, Iowa. Sawmills, if well located, are logical centers for concentration yards.



Photo by U. S. Forest Service

Fig. 3.—Lumber from a portable mill in western Iowa. This lumber may be used on the farm or may be sold in local markets.

generally make the most effective windbreaks, require considerable time to grow to full effectiveness and often must live thru one or more cyclic changes in climate, we need, especially in Iowa, better information regarding species adaptation to different soils in distinctly different climatic zones.

Many other problems need to be investigated before the present and future farm foresters will be able to give farm woodlot owners detailed and accurate advice and assistance. A listing of some of these would include methods and equipment for farm logging; lumber grade yields, log grades and tree classes; handling and treating native wood products for best results; planting and seeding problems; relation of wildlife to farmwoods and windbreaks; and soil and water conservation in relation to farm woodlots and the general farm plan.

A limited amount of farm forest research has been carried on for a number of years by several states either through the state agricultural experiment stations or other state agencies. The U. S. Forest Service through the regional experiment stations has worked directly on a number of farm forest problems and has information from general forest studies applicable to farm woodlots. The Norris-Doxey Act of 1937 carried specific authorization for cooperative federal-state research in farm forest problems, and in lieu of state partnership the federal government can act alone. The recent program of decentralization of the regional federal forest experiment stations, the setting up of various branch stations in cooperation with state agricultural experiment stations or other agencies and increased appropriations are important steps in developing farm forest research. Within the past year Congress has passed the Flannagan-Hope amendment to the Bankhead-Jones Act authorizing increased appropriations for agricultural research which will include farm woodlot problems. So far funds to implement research under this amendment are not available. A general view of the present situation indicates that opportunities for research in farm forestry were never better and that the immediate future seems to hold an intensified research program backed by sufficient funds and personnel to be of great value in restoring farm forests to high productivity.

