

A TRAINING PROGRAM FOR THE
FORESTRY STUDENT INTERESTED IN
OWNING HIS OWN FOREST BUSINESS

By

Milton H. Easton, Jr.

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INTRODUCTION

In a recent magazine article, (3) Charles Luckman, President of Lever Brothers Company, has this to say to the people of America:

"Opportunity, and our guaranteed right to make the most of it, is the primary reason why Americans are several steps ahead of any other nation in mass education, production, health and standards of living. And the reason why no object should be considered impossible by any man or woman." (3)

In 30 years Mr. Luckman rose from a newsboy to the presidency of the \$100,000,000 Lever Brothers Company. Probably this accomplishment would have been impossible in any one of the other leading nations in the world today. Only here in America where our basic concept of living is founded upon opportunity for the individual could this happen. It seems only logical that a young American should want to prepare himself for making the greatest use of this wonderful heritage.

The graduate forester, reflecting on his future career, generally limits himself to two major fields. One of these is with the public agencies, state or federal, while the other is working for private industry. Why does the forestry student not consider fitting himself for a business enterprise of his own? By attaining this goal, a business enterprise of his own, the forestry graduate would be using his great heritage of opportunity to its utmost.

Planning for his own business future may prove to be a necessity to the forestry graduate; for today, forestry schools throughout the nation are turning out more foresters than ever before. Of course this will mean increased competition for every job. Increased competition for jobs may please the hiring agencies because it will

allow them to pick and choose, but what of the forester who applied and was unsuccessful? He will still be looking for a job, and a glutted labor market usually means lower salaries all the way around.

Realizing that the supply of trained foresters may soon exceed the demand, faculty members are requiring higher standards of performance in an attempt to increase the competence of future foresters. This raising of standards will limit enrollments somewhat and will help the situation as will the increasing demand for trained foresters from industry and public agencies. However, the future graduate cannot expect some hiring agency to extend him an eager hand as in the past. He will have to find means of assuring a secure place for himself in the field of forestry. Planning and preparing for a business of his own is one means of achieving this goal.

It appears certain that there will be ever-increasing opportunities for new foresters to own their own businesses. However, these opportunities will be for men who know what the industry requires of them and who are willing to train themselves to meet these requirements. It is the purpose of this thesis to present various business opportunities and to analyze what qualities and training they require of the individual who would develop them.

To accomplish the above purpose, the student should first make a self-analysis to help discover if he is fundamentally suited to owning his own business. Next, a general training program is suggested. This suggested training program is followed by the business opportunity descriptions. Accompanying each business possibility is a suggested course of study for the man wishing to undertake that particular business. It is hoped that this will aid beginning foresters in discovering

some of the possibilities available to them in forestry and also what they will need in the way of training for these businesses.

CHAPTER I

Self-Analysis

The writer suggests that more students plan to fit themselves for a business of their own, but this does not imply that all students should do so. All students entering a school of forestry do not have the inherent qualities necessary to make them successful or happy working for themselves.

To a forestry student beginning his college training this means doing some self inspection. There are two important questions which he should ask himself. First, whether or not he wants to have his own enterprise above all else, and, second, whether he has a high degree of confidence in his ability to make a success of it. In one forestry school there is an orientation course designed to aid the freshman forester in making this analysis. This course is described more fully in the chapter concerning general training.

We might suppose that a certain student has the desire and confidence necessary to pursue his training preparatory to owning his business, but lacks capital or an inherited business background. There is no doubt that these aids would make the going easier, but an earnest desire for ones own business and confidence in ones ability make them unnecessary. The opportunities are there for the person prepared to exploit them.

CHAPTER II

General Training Program

Formal education is one means of preparing for business ownership; apprentice training is another. It behooves the student to make the greatest use of them both. In obtaining his formal education, the student should select a college having good technical schools. For his on-the-job-training the student should make certain that he is getting the type of training he needs for his particular business choice.

Formal Education

The student entering a forestry school who has not already chosen his business should give consideration to the various forest businesses in which he might engage. At most forestry schools he will have at least a year to make his decision because the freshman schedule is the same for the various divisions of the school. Regardless of his ultimate choice, little time will have been wasted on unnecessary courses if a student makes his decision within a year,

There are several things that a student can do to aid himself in making his decision. He can take vocational and interest tests. He can seek advice from his advisor, fellow students or his professors. He will have a good opportunity on summer jobs to test his ability and liking for certain industries that seem to appeal to him in the classroom. Summer jobs also present excellent opportunities for students to discuss the potentialities of various forest enterprises with men connected with these businesses.

The School of Forestry at Oregon State College has an orientation

course for freshmen that is designed expressly for the purpose of directing new students into fields for which they are best suited. In this course, men from the various forestry fields are brought into the classroom so that students may obtain first-hand information as to what these fields require of them. Also, the new students are given a picture of what the forestry profession in general requires of them.

When the student has made his business choice, he needs to know what courses are available at his particular college that will give him the training he needs. For purposes of demonstration, this thesis will use the curriculum of Oregon State College in the discussion to follow.

At Oregon State College, the requirements for any degree are stipulated in the college catalog (4). A student in the School of Forestry would follow the required curriculum, generally, but he might substitute desired courses leading to a specific minor, for some required courses. Of course, his electives could all be of the type suited to his specific needs. Besides the School of Forestry, the schools furnishing the greater per cent of the electives needed by a business-minded forester are the Schools of Business and Technology, Agriculture, and Engineering and Industrial Arts.

There are three departments in the School of Forestry from which the student may choose. They are Forest Management, Forest Products and Forest Engineering. In most instances the procedure would be for the student to major in one of these three departments and select his electives from the other schools mentioned above.

Generally the student interested in some form of forest products manufacturing should take a Forest Products major and supplement this with business courses from the School of Business and Technology. In

this way he not only has an opportunity to become familiar with the technical aspects of wood and its manufacture, but will learn the business management side of the picture also.

The Department of Forest Management has a curriculum which is best suited to the needs of the forester who is planning on growing timber or other forest products, or who desires, eventually, to be a consulting forester. The Department of Forest Engineering is likewise suited to the needs of certain businesses.

In the chapter following, a close correlation is made between the business opportunity and the training necessary for that particular opportunity. For this reason, only a general treatment of the subject has been given here. For a complete description of courses and curriculums, the reader is referred to the official catalog of his particular college.

Apprentice Training

In addition to a formal education, the other means which the student can employ to obtain proficiency in his chosen business is the apprentice or on-the-job-training method. It is difficult to over-emphasize the value of this type of training because there are almost no forest businesses that can be developed without some previous experience in that particular field.

It was mentioned in a previous paragraph that the student could use his summers to become familiar with different businesses to obtain practical on-the-job-training. This summer training can then be followed by more apprentice training after the student has graduated.

In selecting the organization with which he wants to serve his apprenticeship, the individual should make certain that he is

getting the type of training he needs. He should also keep his objective in mind at all times and work with the idea of learning the fundamentals of the job so that when the opportunity presents itself he will be able to take advantage of it and start his own forest business.

For example, let us suppose that the graduate has decided upon owning and operating his own sawmill. If he went to work for a large established mill he would probably be placed in one certain phase of the mill operation. He might learn to run a planer or to handle the cutoff saws, but this experience would not be sufficient to enable him to set up a small mill of his own. Better training could be obtained at a smaller mill where he could really learn all the many details of how a small mill is operated.

The above example does not hold true in all cases, however. In some instances a graduate forester could get better training with a larger organization than he could by working for the smaller company. Training in cruising and scaling, timber appraisal, organizational problems, or certain manufacturing processes might best be obtained from some larger, more efficient company. At any rate, it is for the individual to decide as to what he needs and how best to get it.

CHAPTER III

Business Opportunities and Specific Training Methods

In collecting the thesis material, forestry professors, foresters in the field, and business men in the industry were contacted. To these men who have watched business trends in forestry in the past, the writer is indebted for most of the following business suggestions. The weight of their experience lends real value to these listed opportunities.

Each business opportunity had to meet three basic requirements before it was included in this text. First, it had to be related to forestry; second, it had to be relatively easy to finance; and third, it had to be considered to have a good business future by men who know.

The various descriptions are divided into three main categories. In the first group are listed opportunities for growing forest products directly from the land. The second group contains those businesses that manufacture forest products, and the third, and perhaps most interesting group, is comprised of miscellaneous forest businesses.

No attempt was made to exhaust the field. What was done was to include only businesses which were considered as representative of each particular type. There are several business suggestions included which have not yet been developed to any great extent, and in these cases it was impossible to cite specific examples.

PART I

Growing the Product

On the west side of the Cascades in Oregon, a large variety of forest products can be grown on relatively inexpensive cutover land. The five main crops are Cascara bark, Christmas trees, sword fern, wood and needle oils, and, of course, saw timber. Minor forest products could be cones, bitterroot, gold seal, foxglove, tanoak and Douglas-fir bark, evergreen huckleberry, Oregon grape, cedar boughs, and elk horn moss. These products are given individual treatment in the following section. A thesis by Lester Dunn, written in 1942 at Oregon State College, supplied much of this material (1).

Cascara

Cascara is ideally suited to growth on cutover lands because of its silvicultural features. It is an exceedingly tolerant tree and does well in stands with side shade. Its soil and moisture requirements are similar to Douglas-fir and is a very hardy tree, being relatively free from insect pests and fungus diseases. If cut in early summer, cascara will sprout during the growing season.

In harvesting cascara, the trees are felled to a six-inch stump height. The bark is peeled in large pieces with a peeling "spud" which is usually made from an old file. Although it takes only four to six days in the open air to dry the bark, it must be aged from one to two more years before it is ready for market.

Commercially, cascara is valuable as a laxative or cathartic. The medicinal properties of the bark have never been isolated, and for this reason there is no way in which it can be extracted. In use,

therefore, the powdered bark is mixed with various other medicines and drugs.

Individual tree yields vary from five pounds for a three-inch diameter tree, to 175 pounds for a tree with a diameter of 17 inches. Harvesting rules set up by the British Columbia government require a minimum diameter of five inches (1).

In recent years, shipments of cascara from the Pacific Northwest averaged between 600 and 700 tons per year. The average price per pound of bark for the period between 1931 and 1941 was 5.4 cents. Recent prices, however, have been from four to five times greater than this ten-year average.

Christmas Trees

At the present time, as in years past, most Christmas trees are wild trees which are harvested from privately owned cutover land. Most of those harvested in the Pacific Northwest are young Douglas-firs. This tree has good color and symmetrical form; it holds its needles for a long time after cutting, and has an abundance of foliage. These are necessary qualifications for good Christmas tree stock.

It is estimated that the sale of Christmas trees returned an annual sum of about \$1,000,000 to retailers in the Pacific Northwest prior to World War II. Trees were selling for an average of 25 cents apiece then, but in recent years the poorer trees have sold at double that price, and the price of the better trees scaled upward from there.

An owner of cutover land could either harvest wild seedlings from his land or plant trees on the more suitable sites and subject them to more intensive management. The best soils for this purpose are well-drained, sandy loams having a fair organic content. Eastern or

northern slopes are preferable.

Some growers cultivate the site before planting, but if there is little or no brush present, all that need be done is to scalp the sod around prior to planting. For planting, two-year seedling stock is generally used and planting is done in the early spring just after frost danger is over. Usually, density of stocking is from 3,000 to 5,000 trees per acre. It is estimated that an average rotation age for Christmas trees is six years.

In cutting trees from plantations, the following steps are suggested by Clifford Stephens (6):

1. Find a market.
2. Pick out and sell trees which will show the highest return.
3. Mark trees to be cut.
4. Mark deformed trees if there is a market for boughs.
5. Leave trees showing promise of developing into large and well-formed trees.
6. Cut trees off square at the butt, leaving two large limbs in the lowest whorl. Train these upward to make two new trees.
7. Use a hand saw on larger trees and pruning shears on smaller trees.

Sword Fern

Although the sword fern industry had its beginnings only 20 years ago, it has grown into a thriving forest industry in more recent years. Its commercial range in Oregon is relatively small, however, being bounded by the Nestucca River on the north, Coos Bay on the south, and inland to the extent of the coastal fog belt. There is also a small commercial area near Chehalis, Washington. Fern harvested in these two areas return a current annual income of \$1,250,000 to the

Pacific Northwest.

The fronds from the sword fern are used by florists for decorative purposes such as wreaths, bouquets, and the lining of graves. The fronds are gathered in bunches, each bunch averaging 52 to 54 fronds. Dealers will pay from eight to ten cents per bunch if the fronds meet their specifications. However, only 10 per cent of the fronds grown are of merchantable quality.

Soggy soil with slight drainage provides the best sites for sword fern. The fern must have shade because sunlight discolors the fronds, but the plants will not grow under complete shade. The best sites are to be found on northeast or southeast slopes.

Certain insects damage fern fronds, but little is known concerning these insects or their control. Mountain beaver sometimes eat the younger fronds and in some years ice storms break the fronds. The greatest damage to the sword fern, however, has been done by man. In their enthusiasm for greater profits, pickers remove so many fronds that the plants literally starve to death.

The picking season usually begins in June or July when the new fronds harden, and lasts for 10 or 11 months. This means that it is practically a year-around industry. An owner of fern-growing lands could either engage local pickers on a commission basis, or could do the picking himself. In many areas buyers send trucks on a regular route to collect the fern.

Wood and Needle Oils

At present most of the cedar oil produced in the United States comes from the wood of the eastern redcedar. However, the industry is growing in importance on the west coast. In recent years 50,000

to 75,000 pounds of western redcedar and eastern white-cedar oil, in mixture, were produced annually.

In the west two species supply the raw material from which the oil is produced. They are the western redcedar, mentioned above, and Port Orford Whitecedar. The oil is secured from the foliage of the redcedar and from the wood of the White-cedar.

The oil from the western redcedar is distilled by local people and goes into eastern markets for use in the manufacture of insecticides and liniments. Port Orford White-cedar oil is used in making insecticides, germicidal soap and mercuric iodine, and brings a slightly higher price than does the western redcedar oil.

As a result of experiments carried on at Oregon State College in 1924, a commercial plant for the production of oil from the wood of Port Orford White-cedar was established at Marshfield, Oregon. In this process, sawdust is placed in vats, and steam at 110 pounds pressure is admitted from the bottom. The steam is passed through the sawdust taking the oil with it to the condenser where the oil and steam are separated. The sawdust is then used for fuel in a nearby mill. One man can operate the plant and production is 125 pounds of oil in eight hours (5).

Western redcedar is a common tree along the Pacific Coast. It ranges from southeastern Alaska south to the San Francisco Bay area. It occurs also in the Montana Rockies, the Bitterroots of Idaho and along the eastern slopes of the Cascades to southern Oregon. It prefers moist sites and grows best in a mixed stand of Sitka spruce, western hemlock and Douglas-fir.

Port Orford White-cedar has a very narrow natural range; a strip

about 200 miles long and 10 miles wide in the vicinity of Coos Bay, Oregon. Scattered trees occur naturally outside of this range and various plantations have proved that this tree will do exceedingly well in many parts of the Douglas-fir region.

Timber Production

Three of the aforementioned forest crops, (cascara, sword fern, and the cedars) are the natural associates of Douglas-fir and other Pacific slope timber-producing species. Christmas trees are an early product of future forests. Cutover lands where these products can be grown, will produce timber even with no encouragement by the owner, and under intensive management their timber-producing capacity can be increased many times.

In managing his cutover lands the owner should have in mind the future harvesting of poles, piling or sawlogs. The cedar and fern are tolerant species needing a certain amount of shade for best growth, and even cascara does best in partial shade. In his intensive management of these crops the owner can manage the timber-producing species so that they not only serve their use in relation to his other crops, but also so that they will bear the maximum amount of wood in the form for which he can find the highest market value.

Miscellaneous Forest Crops

The value of several of the minor forest crops that can be grown on cutovers is based on their use by florists for decorative purposes. Cones, evergreen huckleberry, Oregon grape, cedar boughs and elk horn moss fall into this category. The returns from these crops will never be large, but they can be harvested by local people and will provide a small additional income to both the community and grower.

Digitalis, gold seal and bitterroot all grow in western Oregon and all are used in drug preparations. Digitalis, or foxglove, is not a native, but has been introduced and does quite well. It is used in the preparation of drug stimulants. Bitterroot and gold seal both have a limited use in the preparation of medicines.

Tanoak bark has a very high tannin content and has been supplying various quantities of tannin to the tanning industry for many years. Douglas-fir bark has a lower tannin content and it has been harvested for its tannin only in recent years. As the chestnut blight eradicates the eastern chestnut tree, which formerly supplied most of our tannin, the price for tannin seems certain to increase. This will increase the value of these two sources of tannin here on the west coast.

Summary

The plan would be to invest in some relatively inexpensive cutover land and harvest as many of these products as possible. The cedars, in addition to supplying cedar oil, will supply certain valuable wood products. As the lands restock, Christmas trees can be cut and in time some merchantable timber can be removed.

Some far-sighted individuals are investing in restocking cutovers with the harvesting of merchantable timber as their single ultimate objective. This practice has paid good dividends in the past, and as timber becomes more scarce there is good reason to believe that income from this type of investment will increase.

Training Program

A student interested in raising forest crops of the sort described above, would need to know something about agriculture, have a little business training, and know a great deal about forest management.

He is a forest manager who will be carrying his management to such an extent that with certain crops he will be overlapping into the field of agriculture. Of course, it is essential that a man working for himself have a sound knowledge of business.

With this in mind it becomes obvious that an educational institution supplying courses in forestry, agriculture, and business would be most suitable. Because the emphasis is on forest management in this industry, the student should major in that department. His electives could be worked in from the Schools of Agriculture and Business and Technology.

It is rather difficult to get a job in most of the minor forest products industries that have been suggested here, and this makes the practical training situation rather difficult. These are small scale industries which are mostly of a seasonal nature and for this reason no organized hiring system has been set up. However, a knowledge of Douglas-fir silviculture is fundamental to growing all of these other forest products, and there are opportunities for training in this line.

There are jobs with state and federal agencies that offer the beginner a chance to practice and to experiment with Douglas-fir silvicultural methods. The same is true of jobs with some of the larger private industries. A job of this sort would give the graduate a chance to study the silviculture of the minor forest products while managing the timber species.

By taking a forest management major in college, supplemented with appropriate business and agricultural courses, and then adding some experience in silviculture, the forester interested in growing forest products should be well prepared for his chosen business. From a small acreage he could increase his holdings as markets and income permitted.

PART II

Manufacturing the Product

Co-ordinated Mill and Shop

The small sawmill is the main unit for manufacturing forest products. These mills fall into two categories. There are small mills operating on rough logs direct from the woods, and there are the mills involved in the remanufacturing of wood waste from other mills.

A wide variety of both types of small sawmills are in operation today, but for purposes of demonstration only a few of the more representative mills of each type are discussed here. The operation of R. A. Gibson and Son of Grants Pass, Oregon, is an excellent example of the type of mill operating directly from the woods.

Mr. Gibson owns only 160 acres of timber land, and yet this small acreage furnishes the raw material for the entire support of three families and the part time support of several others. Mr. Gibson says that he can cut indefinitely at his present rate because of the high degree of utilization he has achieved.

When an order is placed for a certain size and grade of lumber, the men go into the woods and cut the type of tree that will fill the order with the least possible amount of waste. For instance, if the order were for knotty pine the limbier trees would be logged, just as clear timber would be logged to fill an order for inside finish lumber.

The logs are sawed and air dried and then run through the planer. All of these operations are done in the woods and this procedure decreases transportation costs considerably.

Oak and alder are milled and seasoned during the summer, along with the fir. When winter comes and it is too wet to work in the woods, Mr. Gibson and his crew move into Grants Pass and work in his cabinet shop. Both black and white oak are used in the cabinet work along with alder and the shop grades of fir. None of the oak or alder is trimmed at the mill because by running it through the planer untrimmed and doing the trimming by hand in the cabinet shop, many board feet of lumber are saved.

This is the type of operation that the lumber industry needs, and one that can be developed by the smaller operator. It is needed because it cuts down waste, and it can be developed by the smaller operator because the investment is not prohibitive.

Hardwood Mill

In Oregon there are several small mills devoted exclusively to the production of hardwood lumber in one form or another. There are some mills cutting furniture stock from alder, other mills cutting threshold stock from oak, and still others producing a variety of hardwood products. The G. K. Bond mill near Eugene furnishes a good example of this type of mill.

The Bond mill produces handle and ladder stock from Oregon ash, Oregon white oak and bigleaf maple in 1 3/4 and 2 1/4 inch squares of varying lengths. This stock is partially air dried in his yard and then shipped to a California ladder company where the drying is completed and the stock remanufactured into the finished product.

Mr. Bond has been operating this particular mill for the past ten years with a crew of seven or eight men. He buys some logs from local farmers and does some logging himself. His production is

approximately ten thousand board feet per day and at present he is two to four months behind his orders.

This is an average operation of this type and not nearly as profitable as it might be. If an enterprising forester went into this type of business, many improvements could be made because production methods here are generally very inefficient and the material is handled more times than is necessary.

In the Bond mill a higher price could be commanded for the product if a dry kiln were operated in conjunction with the mill. The rough stock could be rounded before shipping, a market closer to home might be found, and other salable articles could be developed from wood that is now being burned as waste. It is entirely possible that the finished product could be manufactured right in the mill, thus allowing the owner to realize profits that the remanufacturer is at present receiving.

Portable Mills

There are several small portable mills operating today on logs that have been left in the woods by larger operators. These smaller units follow the larger ones, picking up logs that could not be profitably handled with the heavier equipment of the large operator. As the supply of merchantable timber decreases, the standards of utilization will increase and this will mean increasing opportunities for the above type of salvage operation.

There is also a demand for a combination portable mill and logging outfit. There are many isolated tracts of timber and farm woodlots whose owners do not have either the necessary knowledge or the equipment to log their lands. The owner of the portable mill and logging outfit can move from one small tract of timber to another, logging and milling to suit the individual owner.

The decreased costs of lumber transportation, as compared with log transportation, help pay for the expense of moving the portable mill and the operator of the portable mill does not face the possibility of cutting himself out of timber as does the stationary mill operator. Portable mills do not require the investment in milling equipment and timber that the larger, stationary mills do. These facts point to increasing opportunities for more portable mills.

Woodworking Shop

Thomas Miller, of Brownsville, Oregon, is utilizing many of the native hardwoods in a lucrative, part-time industry. In a shop on his small filbert ranch he produces many beautiful and useful items. Articles such as bowls from black walnut, table tops from maple burls, lamp stands from oak burls, and myrtlewood end tables are manufactured to suit the individual taste. Although he never solicits business, Mr. Miller says that he always has a backlog of some ten or fifteen orders.

In his shop are the usual cabinetmakers' tools. His machinery includes a small planer, a mortiser, jointer, band saw, lathe, and several circular saws. With this equipment he is able to handle almost any order in the woodworking line, and yet his investment is small.

Mr. Miller has an excellent, practical knowledge of a great number of woods. This is something that anyone attempting a similar business would have to acquire. His knowledge was not garnered from books, however, but was obtained by actually working with the woods.

The two important things learned here are, that the demand for this type of product is tremendous, and that the investment is small. The forester with an artistic bent and some college training in

industrial arts and business could begin by manufacturing these articles himself. Then, as he built up a trade, he could spend his time procuring material and developing markets while hired artisans turned out the products.

Remanufacturing

For the beginning operator, the remanufacturing field means a small mill located near a supply of waste products from some larger manufacturing concern, generally a sawmill or a plywood plant. The offer made by a mill owner near Sweethome, Oregon, can be used as an ideal example.

This particular mill owner, believing that there are good markets for products remanufactured from mill waste, offered to buy the equipment necessary for a small mill which was to be installed near his larger sawmill. His proposition was that he would furnish the waste material free and pay a salary of \$200.00 per month to any industrious forestry graduate interested in operating the small mill.

The graduate was to develop markets for his products until his income from the sale of these products exceeded the \$200.00 per month salary. Eventually the salary would cease and he could begin buying the small mill from his benefactor. The offer was made during the spring of 1947 and at this writing it is still open.

Small mills of the above description manufacture an ever-increasing variety of products (7). The field is so large that no attempt will be made to cover it in this thesis. Instead, a few representative examples of successful mills of this type will be cited.

A mill near Vernonia, Oregon, is devoted exclusively to the production of surveyors' stakes. The entire mill, including the head saw, cutoff saws and planer, is powered with electricity. Trimmings

from nearby mills supply the raw material and a high degree of utilization is achieved.

A 2 x 4 end, for instance, will be sawed into seven survey stakes which sell for two cents apiece. The State Highway Department and various county engineering departments furnish markets for the total production. This particular mill operates only a few hours a day and yet nets the owner a fine income.

Another mill, of much the same type as the above, is producing paper roll plugs. Here again, waste wood from other mills supplies the raw material. The machinery involved is not expensive and this operator needed only a limited knowledge of small mills to make a beginning. The waste material used can be almost any size or shape and with paper roll plugs as his initial product, he can manufacture other products as he develops markets for them.

Plywood plants are a source of waste wood in the form of veneer cores (2). Small mills located near the plywood plant obtain these cores in lengths of eight feet or longer and produce dimension stock from them. These mills are assured of a continuous supply of clean, uniform raw material, and at present there is an excellent market for the type of lumber produced.

Another remanufacturing unit for which there is a large current demand is the custom planer. The planer operator usually locates his mill on a railroad siding and charges a certain price per thousand board feet for finishing rough lumber. He can also buy rough lumber from small mills that have no planing facilities, run it through his planer, and resell the finished lumber at a substantial profit.

The operator of a custom kiln is in much the same position as the man operating a custom planer. Drying facilities are at a premium

and the dried lumber commands a much better market price than does green lumber. Like the planing mill, the custom drier is usually located convenient to transportation facilities. Lumber can either be dried at so much per thousand board feet, or it can be purchased green by the operator and resold after being dried.

With the demand for seasoned finished lumber steadily increasing, a forester operating a dry kiln and a planer in conjunction could realize the combined profits from the two.

Training Program

The forestry student who desires eventually to manage his own manufacturing concern for forest products will need to know manufacturing processes, business procedure, and something about wood properties. At Oregon State College, the Forest Products Department of the School of Forestry has a curriculum which supplies the three fundamentals as stated above.

This Forest Products curriculum gives the student thirteen term hours of courses dealing with manufacturing processes and nine term hours of wood properties courses. Within the department are two courses of three term hours each which deal with the business aspects of the industry. In addition, there are fourteen term hours of business courses in the School of Business and Technology.

For most of the industries discussed in this section of the thesis, it would seem wise to select the electives from the School of Business and Technology. However, the student interested in a wood-working shop, as suggested by the Thomas Miller example, would need additional courses from the Industrial Arts Department of the School of Engineering.

On-the-job-training for these businesses could be obtained simply by getting a job with the type of mill or shop which the student would eventually like to own. A small mill with a reputation for efficient production methods would perhaps be best for students interested in small mills. Any of the myrtlewood or burl factories would give good experience to the student interested in the woodworking line.

Dry kilns probably require more experience and training than would at first seem the case. Each kiln and each type of lumber must be handled differently, and there are several tree species concerning which little drying data have been gathered. By developing and improving drying schedules, the kiln operator could very easily increase his income. For these reasons the student should seek training in a kiln whose operator has had sound technical training as well as practical experience.

PART III

Miscellaneous Opportunities

In addition to the opportunities for growing or manufacturing forest products, there are several business opportunities which can be classified under neither of these headings. Some of the more interesting and financially profitable business opportunities fall into this category. One of these is the business of seed collection. This business has reached large proportions only in recent years and promises to increase in size as both local and foreign markets expand. Even now, the demand for tree seeds exceeds the supply.

Seed Collection

Originally, the writer intended listing seed collection as a sideline for the forester engaged in raising forest products on cutovers, and this it might well be. However, the business has so many potentialities that it warrants separate treatment.

The forester interested in making seed collection his major business must make his largest investment in a cone drier and seed extraction equipment. The cones can be collected by ranchers, loggers, fire crews and school children for so much per sack. The sacks can be collected periodically during the season and transported to the extraction plant. Here the cones are dried and the seeds are removed and cleaned preparatory to marketing.

State and federal forestry agencies and many of the larger forest industries use much more seed annually than they are able to collect themselves. There is also an increasing demand for tree seed from

foreign buyers. Between these foreign outlets and local consumption, the seed collector should have no trouble in selling his product.

College training preparatory to establishing a seed collection industry should consist of a Forest Management major with a minor in the School of Business and Technology. Practical experience can be obtained with state, federal or private seed collection departments.

Timber or Lumber Broker

The experienced forester might very easily combine the seed collection business with that of buying and selling timber. The man who can cruise timber on a quality basis stands an excellent chance of making money.

To become proficient at quality cruising, as it is called, a forester would first need experience in volume cruising. When he had learned to tally volumes accurately he would next need experience in milling and marketing so as to learn what values can be derived from various types of logs. The final result of this training would be to enable him to determine the market values of trees as he sees them in the woods.

The formal education for the quality cruiser should consist of a Forest Management major and a minor in the School of Business and Technology. Private timber companies or the state and federal agencies all hire cruisers, and a graduate forester could easily obtain his cruising experience there. A mill or lumber yard would provide the necessary job training in milling and marketing.

Akin to the timber broker is the lumber broker. This is also a field requiring considerable experience in evaluating the product. However, for one who knows market values, it is not difficult to buy

lumber from small mills and resell it at a profit.

Experience in this line could be obtained in a lumber yard or in the marketing division of a large mill. The formal education recommended for a student interested in developing this business would be a Forest Products major and a minor in the School of Business and Technology.

Consulting Forester

From the standpoint of a Forest Management graduate, the consulting forester business is perhaps the ultimate goal. A consulting forester not only owns his own business but he is also practicing the profession for which his college education specifically trained him. Too, the demand for consulting foresters is increasing because timber owners are beginning to appreciate the fact that managed forests produce larger amounts of high quality products than do unmanaged forests.

Consulting foresters are generally men who have a wide background in forestry. Usually, several of these experienced foresters will form a company and sell their services and knowledge to timber owners. Sometimes individual foresters with broad experience in forestry serve as consulting foresters in addition to operating other businesses.

Consulting foresters should know all phases of forestry because of the wide variety of jobs they may be called upon to do. Many times forest owners contract a company of consulting foresters to formulate management plans for their entire forest holdings, totalling perhaps thousands of acres. This means that the group of consulting foresters must have the knowledge necessary to enable them to plan an entire management program.

In other instances consulting foresters might be asked to gather data relating only to a certain phase of forest management. Cruising

jobs are the most common of these, and a knowledge of aerial photography is becoming an essential part of present day cruising, especially whenever large tracts of timber are concerned. Protection plans, road planning, type mapping, or just the running of public land survey lines are other jobs which the consulting forester may be asked to do.

There is a particularly great demand for timber cruisers. Today, as in the past, forest owners want to know how much timber they own, and timber buyers must know the quantity of timber on a particular tract before they buy. Timber values are increasing, more stands are becoming accessible, and a great deal of timber is changing hands. A graduate forester might do well to specialize in this phase of forest management.

Another opportunity for specialization in the consulting forester business lies in the farm woodlot. Farmers have long been the victims of unscrupulous timber buyers simply because farmers have never known the true value of the timber on their woodlots. In addition, farmers never realize maximum volumes from their woodlots because they are farming and know very little about forest management.

To begin this business a forester would have to convince farmers that he could show them how to increase their earnings from their woodlots. He might possibly do this by cruising a woodlot just after some logger had made an offer to the owner of that particular woodlot for the timber thereon. More than likely the cruise would reveal that there was more value on the woodlot than the farmer had suspected, and, of course, this would mean that the farmer could demand a higher stumpage price from the logger.

If the above demonstration convinced a sufficient number of woodlot owners that technical advice was of value, the forester would

have accomplished his initial purpose. From then on the individual farmers could each pay a percentage of the forester's salary, and by so doing, avail themselves of his continued services.

Training Program

The Forest Management curriculum in the School of Forestry at Oregon State College is the curriculum best suited to train a man for the consulting forester business. The consulting forester is of value to the timber industry because he can show timber owners how to manage their holdings more profitably, and it follows that he should have a sound educational background in forest management.

This Forest Management curriculum furnishes technical training in the phases of management which are important to a consulting forester. Mensuration, protection, engineering, silviculture, forest economics, administration, timber management and soils are all basic to a sound knowledge of forest management. All of them are incorporated into the Forest Management curriculum.

As to his practical training, a graduate can obtain excellent experience with either state or federal forestry organizations. In addition, there are some opportunities for experience with existing consulting forester firms. A student might get his general management background with the government agencies and finish his practical training in the employ of a consulting forester firm. In any event he would need several years of experience before attempting to establish himself in the consulting forester business.

THESIS SUMMARY AND CONCLUSIONS

In this thesis the writer has sought to interest more forestry school graduates in owning their own forestry businesses. The thesis adopts the general premise that America is a land of business opportunity, and more specifically that forestry offers especially good business opportunities to graduate foresters.

It is recognized that all forestry students are not interested in, nor suited for, business careers. To help students make the correct decision concerning their future careers, a chapter on self-analysis was included and the essential qualifications for success in a forestry business were pointed out.

It is often said that experience is the best teacher, and this is no doubt very true. Where a business man is concerned, however, both educational and practical experience must be obtained. Ways and means of obtaining the correct training of both an educational and a practical nature are discussed in the second chapter of this thesis.

To prove the point that there are good business opportunities for forestry graduates, detailed descriptions of worthwhile opportunities are given. These business opportunities are divided into three categories, namely: growing the product, manufacturing the product, and miscellaneous opportunities. Accompanying each business opportunity is a suggested method of training for that particular opportunity.

It is hoped that those who become interested in owning their own forestry businesses will find in this thesis some help in choosing a business and in preparing for that business.

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