ECONOMICS OF SEEDLING PRODUCTION

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During the past 10 years our firm, under the guidance of Gene W. Peotter, has developed a system of cost analysis for our nursery. The system encompasses all categories of plants we grow, but this paper will be limited to the application of the system to the production of seedlings. The basic concept of our system is that we distribute all expenses in developing our average cost per plant per year. The program is simple once the principles are understood. Following are some of the basic principles that will help you understand the program.

Categorization is the first step in the program. In our case, we divided our corporation into five categories: *wholesale nursery, greenhouse, landscape, garden center* and *administrative overhead*. The last item is a division in which, at the end of each month, we spread the expenses back across the other four divisions by a percentage of sales of each division. We further break down the wholesale division into the following categories which we entitled enterprises: *seedlings, once-transplants, twice-transplants, potted stock* and *birch*. Every plant we grow in the wholesale nursery can easily be placed in one of these categories. In the case of the seedlings, once-transplants and twice-transplants, we further categorized each of these enterprises into phases called *planting, culture* and *harvest.* (Presently we include selling costs in the harvest phase but we are separating them in the future).

The labor distribution sheet is a vital part of this system. Once again, the enterprises described above appear on the labor distribution sheet as well as the culture and harvest phases. We have not found it necessary to make a breakdown of the *planting phase.* The *cultural phase* is broken down into categories of *irrigation, weeding* and *fertilization* and the *harvest phase* is broken down into *digging, grading* and *packing*. Indirect labor such as soil improvement, building repairs and machinery repairs are distributed at the end of each year by special schedules back to the specific phases, enterprises and divisions.

Each employee is required to fill out a labor distribution sheet at the end of each day which must be kept to quarter hour units. A written description of each category is available to the employees. A careful program of planning for the institution of such a program is necessary if the employees are to understand how and why they are filling out a labor distribution sheet.

Salaries of the owners should accurately reflect their worth to the business. °An owner who takes a salary less than his worth, hoping to recoup the rest of his true worth in profits, can greatly distort a cost analysis picture. Salaries should accurately reflect worth to the corporation and profits should reflect reward for ownership or investment in the business.

Compound interest on investment is essential to establish a true cost per plant. A seedling which takes 2 yr to grow must reflect compound interest upon the original investment made 2 yr prior as well as the interest on the investment the second year. This concept is quite simple to understand. A seedling growing in the field is much like money in a savings account at the bank. If you placed $100.00 in the bank 2 yr ago, you would expect to earn interest from the date on which you made the investment. Likewise, if you put in an additional $100.00 this year you would expect interest on the additional investment. Plants growing in our fields are in a sense our green banks. A true cost of a seedling must reflect compound interest on the monies invested.

All expenses must be distributed to the various categories. We have found it best to make this categorization at the time we stamp our accounts-payable invoices for payment. We code each invoice and this in turn is placed on the check stub. Every invoice is coded as to the division in which it belongs. Depending upon the specific expense account involved, we may be able to further categorize the invoice into the proper enterprise and even into the proper phase. Thus, an invoice for fertilizer for our seedling production would be coded "fertilizer/wholesale nursery/seedling/culture. We use abbreviations for all of our coding. (fert/wn/s/c).

Some invoices do not lend themselves to this complete breakdown. An example would be fire insurance. A special schedule for this account would be used. Our local insurance salesman is required to help us interpret each specific policy so that we can place it into the proper categories when the premiums are paid. This is not as difficult as it may seem. Obviously, fire insurance would only be involved in the harvest phase. The breakdown between enterprises is based upon space occupation of specific buildings involved. The salesman can help determine the premium allocation to each division. Logical and systematic thinking will enable a person to develop a system for distribution of each invoice.

Accurate inventory information as well as sales data is vital. We have a rather accurate inventory available as part of our running inventory procedures. Each August we make a complete inventory of all the stock in the field. In the case of seedlings we use a 1 sq ft randomized minimum ten count per seed lot procedure. We also have a discount schedule that is applicable to the density counts. We always have a minimum 20% discount even

on the best looking seedlings with proper density. We have discovered that this minimum of 20% will cover plants that die, are damaged in harvest, or for one reason or other never are shipped to our clients. Crooked plants, too high density, over-production and many other factors will cause us to increase this discount rate. We are attempting to accurately reflect the number of plants that we feel will be sold. This is essential because too large a number will give us too small a cost per plant, while a low inventory will raise the cost too high.

In the case of seedlings, the only difference between the inventory for planting phase and cultural phase is that in the planting phase we include only those plants which were actually planted or seeded in the year in which we are making our cost analysis. Sales records will accurately reflect the total numbers of plants involved in the harvest phase. Each selling size of each genus or cultivar is coded by age. Thus, a seedling in our system would either be coded 1-0, 2-0 or 3-0. From this code, we can begin to build on the modular average cost of the plant.

We next construct a modular average cost for the specific size and genus or cultivar. A 3 yr old Colorado blue spruce seedling might be listed in our catalog under 3 yr old seedling, 6 to 10 inches. We can now construct the modular average cost of this plant. We know that it is a 3 yr old plant. The first year we apply one modular planting cost phase and one modular culture cost phase. There is no harvest phase the first year. The second year we apply another modular culture cost phase; again, there is no harvest phase. The third year we apply a third culture modular cost phase and finally a modular harvest cost phase. Adding all of these modular phase costs together, we come up with the average cost of this particular plant.

Through a system of averaging, we are essentially using a replacement cost figure which is most appropriate during the high inflationary period in which we are now involved. It is important to understand that our true costs must reflect as close as possible the replacement costs or we will find our profits overstated (inflationary profits).

In summary, we have discovered that this system of cost analysis has given us an accurate picture of the average costs of a particular size plant. We base our pricing heavily upon the information we gain from this system. Naturally in a high inflationary period it is necessary to project into the future your costs and adjust your price structure accordingly. However, this system does give you a proper base cost of a particular size plant. We have discovered some real surprises after the system was operating for a time, such as the fact that 40 to 45% of our total cost is involved in the selling and harvest phase. This information led directly to

mechanization of our digging operation and building of a complete new grading, shipping and cold storage facility.

The real proof that the system has worked for us, is the fact that our profit margin has steadily improved as we progressed with the system.

MODERATOR HENRY: Thank you, Tom. Our next speaker is Earl Robinson who's going to discuss with us the costs involved in container production.

TRACKING COSTS IN CONTAINER PRODUCTION

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I believe that we at Medford have developed a very simple and yet unique method of tracking costs that work. We have divided our costs into 8 areas: i.e. propagation (I), containering (II), growing (III), general (IV), selling (V), shipping (VI), administrative (VII), and capital (X).

All costs of materials and labor for any given year must be charged into one of these categories. After all costs are entered we break them down to a cost per plant or container produced. We keep a record of all plants planted during the year, and charge our costs as described below. It is virtually impossible to accurately account for cost by acre or plant cultivar as our acreage is too diversified and the record keeping is impossible to maintain. Many sizes, ages, rates of growth, etc. do not lend themselves to keeping costs in this manner.

We start by keeping our ledger sheets up to date, time cards posted daily, etc. Then at the end of the year we make the following computations: To the inventory of empty containers at the beginning of the year, we add the number of containers purchased and re-used which gives us total containers. From this, we subtract the end of the year inventory of empty containers which gives us total containers used (TCU). The gallons per container for each container cateogry is multiplied by the containers used to give *total accumulative gallons* — (TAG).

For example:

TCU	SIZE		TAG
10,000	1G	=	10,000
30,000	2G	=	60,000
20,000	3G	=	60,000
40,000	5G	=	200,000
10,000	7G	=	70,000
			400,000 accumulative gallons planted