

**A. Wynia**

*Thunder Bay Forest Station  
Ontario Ministry of Natural Resources  
Thunder Bay, Ontario*

Controlling costs is a vital management function. As nursery managers we play a major role in controlling the cost of reforesting every hectare of cutover that must be planted.

At the nurseries we have learned many ways of saving money; however, in the field I have seen an ever-increasing demand for more expensive stock, where consumers are not held accountable for costs but only for results in terms of survival and growth. With the skyrocketing costs of tree planting this may not be an undesirable trend, but because many of my remarks are directed towards nurserymen, I also appeal to our tree planters to get their priorities in order with respect to spending in reforestation. Whoever spends it, we must give the taxpayer value for his money. All expenses should be controllable by someone at some level.

Obtaining cost accounting information on a bare-root production nursery is different from a manufacturing situation due to the time span of 2 to 5 years and the influence of many uncontrollable cost factors. Present inflation rates make historic costs useless. As well, changes and improvements in production processes need to be assessed at least annually and preferably more often.

Twenty years ago, one of my predecessors at Thunder Bay (E.M. Cressman) foresaw the problem of historic costs, however they might be obtained, and developed the concept of determining production costs based on age classes. Over the years this principle has been expanded and the system is now being used on a provincial scale. Recently we have been able to integrate it into the provincial Management Information System (MIS). We feel now that we have a workable system involving a minimum amount of record-keeping and yet providing us with adequate information and, most of all, flexibility to analyze the effect of any procedure we may wish to study in isolation.

The cost accounting system consists of the following components, all of which are part of our regular administration:

1. records of inventory in numbers and hectares occupied for each age class, species, and seedlot, with a forecast of numbers of trees expected to be shipped in the appropriate year,
2. records of expenditures by age classes and a number of variable and non-variable overhead and "suspense" accounts,
3. allocation of our available funds into the "slots" where they are expected to be spent and a monthly MIS update so that we can regularly compare our expenditures with our plans,
4. an annual report on our production costs made up from the accumulated age class unit costs plus the current shipping cost with prorated overhead costs included,

5. the cost records of our container stock production, which have been integrated with the age class record system even though because of the short production period we can use historic costs for them, and
6. a report that at the completion of the shipping year is sent to all client districts that have received trees and shows the production costs associated with each of the age classes of stock that they received.

Due to the policy of the provincial government, we cannot include capital costs or seed costs even though it would not be difficult to incorporate them as direct costs and overhead prorated costs. Operating improvements as a result of capital investments therefore show directly as savings. All coding for the system is done daily by a senior nursery staff member and takes less than 15 minutes.

The annual and monthly computer-produced MIS reports summarize all expenses of the nursery under the regular MIS categories such as permanent salaries, seasonal salaries, services, communication, etc., for each specified production cost code. The input for the MIS reports are the processed and pending coded payrolls and invoices submitted to our financial branch. The month-end report is usually available within 1 week after the end of each month.

For example, all costs associated with transplanting 1 V2+1 V2 stock, weeding it, and fertilizing it in the fiscal year are shown by codes and categories for review and analysis. They are totalled to obtain the annual direct expenditure on that age class. Figure 1 shows a page of this monthly MIS report.

The indirect expenditures are shown elsewhere and include land preparation, irrigation, fertilizer purchases, etc., and overhead. The former costs are obtained from holding accounts and are assigned on the basis of acreage occupied and the latter are prorated on the basis of total direct expenditures. Some shifts may be required to adjust for large changes in operating procedures, as when insufficient land has been prepared for transplanting due to increases in targets.

When the total costs have been determined for each age class by product in the fiscal year, including overhead costs and special adjustments, the current inventory and forecast provide the information needed to obtain the per thousand cost component of that year for that product. By simply adding the current year's component costs, a total cost rating can be obtained.

Table I illustrates a very simple calculation of costs for a nursery producing 1+0, 2+0, and 3+0 stock. Using the same approach of determining cost ratings rather than historic costs also avoids the problem of the discrepancy between fiscal years and shipping years in our production process.

Having plenty of "slots" in which to place costs of special interest within the age class category enables a nurseryman to pinpoint certain operations in which he is particularly interested. For example, we are currently looking at the impact of our mechanical harvester on our shipping costs. Costs associated with shading during the first year for some species and not others can be separated out if desired. We have found a two-digit decimal breakdown quite adequate. Table 2 is an example of a section of our coding manual.

SUB-LOCATION 2081 THUNDER BAY FOREST STATION  
ACTIVITY 4200 FOREST MANAGEMENTPROJECT REPORT  
PERIOD ENDED AUGUST 31, 1980

RUN DATE 08/30/80

	EXPENDITURE CURRENT MONTH	EXPENDITURE TO DATE	ACCRUED EXPENDITURE	EXPENDITURE TOTAL	ALLOTMENT CURRENT CHANGE	ALLOTMENT FOR YEAR	BALANCE OF ALLOTMENT
PROJECT 31							
B SALARIES	21.78	35.80		36			36-
TOTAL B SALARIES	21.78	35.80		36		500	464
PROJECT 31 TOTAL	21.78	35.80		36		500	464
PROJECT 40							
SUPPLIES		62.40		62			62-
PROJECT 40 TOTAL		62.40		62			62-
PROJECT 41							
A SALARIES NORMAL		1,677.28		1,677			1,677-
B SALARIES		22,051.35		22,051			22,051-
TOTAL B SALARIES		22,051.35		22,051		23,000	949
TOTAL EXPENDITURE		23,728.63		23,729		23,000	729-
TOTAL		23,728.63		23,729		23,000	729-
PROJECT 41 TOTAL		23,728.63		23,729		23,000	729-
PROJECT 42							
A SALARIES NORMAL	1,117.20	1,117.20	605	1,722			1,722-
B SALARIES	31,844.10	32,793.04		32,793			32,793-
TOTAL B SALARIES	31,844.10	32,793.04		32,793		50,000	17,207
TOTAL EXPENDITURE	32,961.30	33,910.24	605	34,515		50,000	15,485
TOTAL	32,961.30	33,910.24	605	34,515		50,000	15,485
PROJECT 42 TOTAL	32,961.30	33,910.24	605	34,515		50,000	15,485
PROJECT 43							
A SALARIES NORMAL		60.64		61			61-
B SALARIES	1,129.38	2,302.66		2,303			2,303-
TOTAL B SALARIES	1,129.38	2,302.66		2,303		1,200	1,103-
TOTAL EXPENDITURE	1,129.38	2,363.30		2,363		1,200	1,163-
TOTAL	1,129.38	2,363.30		2,363		1,200	1,163-
PROJECT 43 TOTAL	1,129.38	2,363.30		2,363		1,200	1,163-
PROJECT 44							
B SALARIES	4,323.11	4,811.69		4,812			4,812-
TOTAL B SALARIES	4,323.11	4,811.69		4,812		2,000	2,812-
PROJECT 44 TOTAL	4,323.11	4,811.69		4,812		2,000	2,812-
PROJECT 45							
B SALARIES	58.08	128.18		128			128-
TOTAL B SALARIES	58.08	128.18		128		800	672
PROJECT 45 TOTAL	58.08	128.18		128		800	672
PROJECT 48							
A SALARIES NORMAL		134.40		134			134-
B SALARIES	4,474.76	4,689.64		4,690			4,690-
SUPPLIES		5.97		6			6-
TOTAL EXPENDITURE	4,474.76	4,830.01		4,830			4,830-

Figure 1. Sample page from a monthly MIS report.

Table 1. Schematic calculation of nursery stock production costs

Age class	Recorded	Ha	Land costs	Total operating cost	Office prorated	Total costs
1-0	10 000	26	3 569	13 569	2 714	16 283
2-0	5 000	20	2 745	7 745	1 549	9 294
3-0	3 000	<u>5</u>	<u>686</u>	<u>3 686</u>	<u>737</u>	<u>4 423</u>
Maintenance land costs	7 000	51	7 000	25 000	5 000	30 000
Office	5 000					
Fixed costs	<u>10 000</u>					
	40 000					

  

Age class	Product	Ha	Costs	Inventory (mm)	Cost/M	Forecast ship (mm)	Success ratio	Cost rate/M	Acc cost rate/M	Total production cost rating/M
1-0	1-0	6	3 757	4.0	.94	3.7	.80	1.18	1.18	2.03
	2-0	15	9 395	17.0	.55	11.1	.66	.83		
	3-0	5	3 131	3.0	1.04	1.8	.60	1.73		
2-0	2-0	14	6 507	10.5	.62	6.3	.60	1.03	1.86	3.35
	3-0	6	2 787	2.5	1.11	1.9	.76	1.46		
3-0	3-0	5	<u>4 423</u>	2.1	2.11	1.7	.81	2.60	5.79	7.72
			30 000							
<u>Total costs</u>		40 000								
Variable		30 000		= 1.333						

The values that I as a nursery manager have been able to derive from our age class costing are as follows:

1. Cost problems show up in the year and at the time that they occur and in the exact location where improvement may need to be made.
2. Operational improvements show up as savings immediately, providing managerial flexibility within the nursery system and also at higher levels. Table 2. Cost accounting codes (TBFS - 2061) 1978/79

4265      NURSERY COST ACCOUNTING FOR STR (Cont'd.)

Projects:

Div. 4      First-year Transplants, i.e. 2-1, 1.5-1.5, 1-1

- |    |   |
|----|---|
| 40 | STR transplant share of land preparation from Job 80  |
| 41 | Transplanting 2-1, includes lifting and transportation to transplant field as well as transplanting |
| 42 | Transplanting 1Y2-1Y2   |
| 43 | Weeding 2-1, Manual and chemical, LABOR only  |
| 44 | Weeding 1Y2-1Y2, Manual and chemical, LABOR only  |
| 45 | Application of fertilizer, top dressings, fungicides, insecticides, LABOR only                      |
| 46 |   |
| 47 |   |
| 48 | Tape transplanter   |
| 49 | Holland transplanter rebuild  |

\* Prorated at year end from Job 80.