

the grafters would try to hurry too much and turn out lower quality grafts. Instead, we use close supervision to keep everyone busy and producing high quality grafts.

This program we use on apple grafting is nothing new or fancy, but if done properly, it can produce excellent results. It is directed at one main objective: "Produce the highest quality liner possible at a reasonable economic level."

TOM McCLOUD: You mentioned leaving a gap in the tape to look for problems. What problems are you looking for and how do you correct them.

STANLEY FOSTER: One thing we hope to find is a lot of callus growth. If none is occurring we will check for proper alignment. You also find mold growing sometimes. In that case we dip them in fungicide and repack. That often means that the sphagnum moss was too wet when packed. You can also see fireblight at this stage sometimes. The checking is done on a spot basis.

RALPH SHUGERT: I notice that you were doing both piece root and whole root grafting. Have you checked both ways for survival?

STANLEY FOSTER: Yes, and we basically found no difference.

RALPH SHUGERT: What pear stocks are you using?

STANLEY FOSTER: We use *Pyrus calleryana* only.

VOICE: Do you have problems with your scions rooting?

STANLEY FOSTER: No. We have more problems with the understock sprouting. We control this somewhat by planting them deep.

COST ACCOUNTING TO PROPAGATE PROFITS

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The principal reason for being in the propagation business is to make a satisfactory profit. A satisfactory profit level does not occur as a matter of chance but is a result of careful management of the activities of the firm. This, of course, includes the controlling of costs and the determination of realistic prices for products and services in line with competition in your market area. Production and sales should be undertaken with full recognition of all costs involved to maintain a profitable business operation.

As part of a marketing strategy, you may decide to cover all costs on a specific product, but this is a different situation than propagators who do not recognize all costs associated with the product and consequently sell at a price which is not sufficient to cover all expenses. Even though this propagator can't survive in the long run, he can cause problems for his competitors while he is in business

The purpose of this paper is to examine costs in the propagation business and develop a means to allocate these to a particular product. This means finding some simple means of allocating costs of operating a propagation business that will allow growers to price their products for profits.

SITUATION

The propagation business, like most other business enterprises, and the greenhouse industry, is faced with increasing production costs. The cost of labor, materials and energy have forced up production costs and, as a result, prices too have had to increase. However, cost increases are often absorbed by growers who fail to identify and compensate for such increases by raising prices accordingly.

The need to raise prices is inevitable, as inevitable as increasing costs. Yet many times propagators fail to raise prices enough to cover costs or to maintain desired or previous profit margins. The failure to cover costs and/or maintain reasonable profits will surely mean the demise of a propagator's business or the lack of future growth and the slow demise through profit starvation.

What is needed to correct such a situation in most cases are cost records, a planned greenhouse program, and a cost accounting system for the propagator's business. Cost records are the basis of the business and the means of identifying and monitoring business expenses and product costs. A planned greenhouse program is key to the successful propagation business. It quantifies the space resource — square feet of propagation bench — and organizes it into a plan and meshes it with the cost record system. The result is an integrated cost record keeping mechanism linked to the propagation program and space which leads quite naturally toward a cost accounting system that combines all the components that are needed to determine the elements of total product cost.

ELEMENTS OF TOTAL PRODUCT COST

Elements of total product cost consist of materials, labor, and all overhead services (Figure 1). All of the proportionate share of these costs should be allocated to each particular product.

Direct Materials Cost. Direct materials include cuttings, soil, peat, pots, chemicals, or other supplies which actually become an integral part of the product. It also includes cost items such as sales tax, handling charges, and freight which can be directly applied to a specific product.

Direct Labor Cost. Direct labor cost includes wages, fringe benefits, and payroll taxes for labor and supervision which are directly related to the particular product.

Overhead Cost (Indirect). This category consists of all other costs that are not included in direct costs. Some of these are supervisory salaries, utilities, depreciation, insurance, annual rentals, property taxes, auto and truck expenses, professional services, office supplies, secretarial salaries, and interest expense. Most overhead items are difficult to allocate to a specific product. However, they can be allocated, if you deem it necessary, by developing a cost accounting system to determine the amount for each job.

Direct vs. Overhead (indirect) Costs. Two criteria can be used to tell if a cost should be classified as direct or overhead. Direct costs occur as the direct result of that product. Other costs like insurance, interest, and depreciation are more difficult to tie specifically to a particular product. Overhead costs occur if: (1), it is impossible to allocate a cost item specifically to a product; (2), it is economically unfeasible to allocate the items as direct costs; or (3), the costs are not considered of enough importance to be accounted for as direct costs.

COST ACCOUNTING SYSTEM

The object of any cost accounting system should be to assign all income and expense items to each crop. The components of such a system are:

1. Crop Cost Records
2. Cost Allocation System
3. Rent System
4. Cost-profit comparison

These components are the basis for determining direct material cost, direct labor cost, direct cost, indirect cost, and total product cost (Fig. 1). The cost accounting system then enables the total product price to be determined with reasonable profit and any contingency costs accounted for (Fig. 2). The workings of the above components need to be elaborated.

Crop Cost Record. This consists of a form for each crop or product being propagated and sold. It should indicate the receipts, labor, material, overhead, and units sold for that crop. The crop should be identified by name and by a crop number (Table 1).

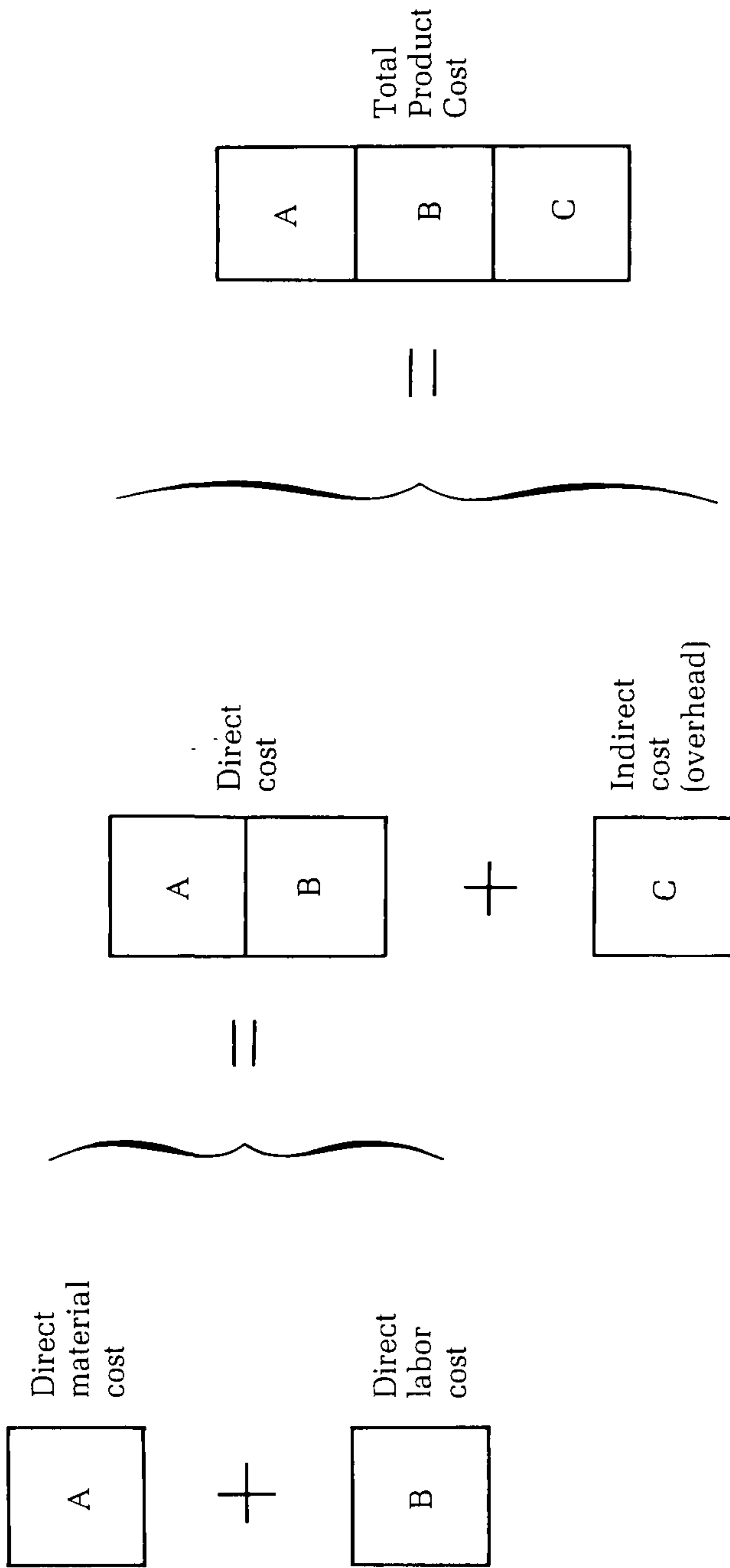


Figure 1. Elements of total product cost

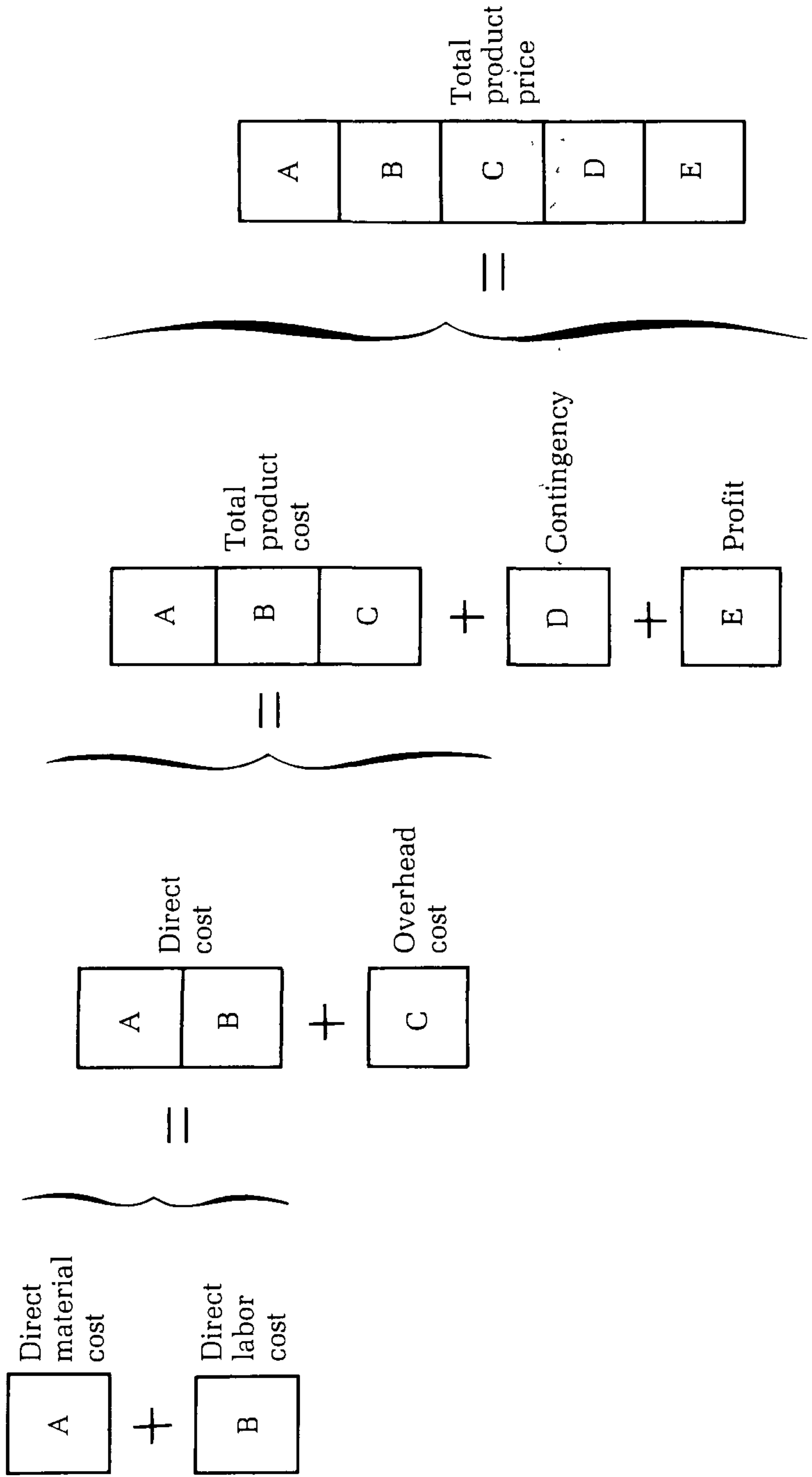


Figure 2. Elements of total product price

Table 1. Crop cost record form

Month	Crop Azalea		Crop No 5		Units Sold
	Receipts	Labor	Materials	Overhead	
Jan	3,000	100	100	1,000	6,000
		150	100		
		200	50		
TOTAL	3,000	450	250	1,000	6,000
	-1,700 cost			+250 material	
				+450 labor	
	<u>\$1,300 profit</u>			<u>\$1,700 cost</u>	
		$\frac{\$1,700}{6,000} = \0.283 cost each			

Cost allocation system.

Receipts are tabulated and recorded from receivable accounting process. This should be done on a weekly basis. The weekly receipts should then be entered on the crop cost record.

Labor cost should be entered on the crop cost record on a weekly basis. The labor cost should be obtained and tabulated from the printed time sheets which each employee should complete. The labor time sheet should be a daily record by crop number with non-crop time allocated to overhead. These time sheets produce weekly crop labor costs (Table 2).

Table 2. Employee weekly time sheet for producing weekly crop costs

NAME	CLOCK #							RATE	DATE
Crop #	1	2	3	4	5	6	7	TOTAL	
Mon		4		3			1	8	
Tues	6		1		1			8	
TOTAL HRS									
TOTAL \$									

Materials are entered on the crop cost record from the charge or cash invoices for each crop. General supplies used for many or all crops should go to overhead. Overhead for the crop cost record should be computed and entered weekly. Into this overhead category should be general labor and materials used for the overall production and propagation of crops. The indirect expenses of business, such as utilities, management, etc. are accumulated in overhead to be then allocated to the crops. That allocation procedure should be on a square footage basis of propagation area.

Rent system.

Bench space usage is needed on each crop for the allocation of overhead costs. That square footage use by crop and crop number should be obtained weekly by inventorying of all crops by the house, crop, and square foot occupied based on bench and house layout maps (Table 3)

Table 3. Space inventory form

Week Ending _____			Foreman _____		
House	Bench	Area	Occupied	Crop	Remarks
3	1	600			
	2	600			
4	1	900			
	2	900			

Cost-profit comparison.

The number of unit sales entered on the crop cost record should be the original estimates of the quantity to be sold and the actual quantity sold based on the receipts. Comparisons should be made between these figures and non-marketable amounts noted.

Crop profit can be computed right on the crop cost record after totaling the weekly and monthly amounts for receipts, labor, materials, overhead, and units sold. Receipts less costs equal the crop profit. Crop profit divided by the units sold gives the profit per unit. Cost per unit can be obtained in a like manner by dividing total cost by the number of units sold. (Table 1).

This determination of cost and profit is essential for all businesses. Profits are needed to survive and grow. However, a system of cost accounting is needed to assign all income and expense items to each crop. That system can be a simplified or a sophisticated system of cost accounting.

It is important to keep accurate records and to have a well-planned greenhouse program. Some growers and propagators work on a guessing basis and yet have been able to operate and show a profit. Because many growers do not know how to arrive at their costs, they have sold their products below their actual cost of production, and ended up taking a loss.

For most propagators the simplified cost accounting system is of value if the grower does not need more detail about labor costs and operating expenses. However, the costs and the benefits need to be weighed before deciding on an accounting system.

The simplified system should be the starting point for all propagators. It offers great benefits and is not costly. The system is composed of employee time sheets which provides payroll and labor cost per crop information. It is the basis for allocating materials cost, overhead cost, and receipts to the crop. The results of the simplified system are information on costs, receipts and profits in total and per unit.

A model formula for the simplified accounting system to arrive at unit cost is shown in Table 4 with an example in Table 5.

Table 4. A model formula for the simplified accounting system to arrive at unit costs

Monthly space occupied (inventory by square feet of bench space)	×	Average monthly indirect cost (overhead per square foot of bench) + Depreciation per square foot of bench	×	No of months grown	+	All direct costs for materials (seed, bulbs, plants, and direct labor) = Unit Cost
divided by the number of units produced per crop						

The “Greenhouse Plant Cost Estimation Program” on the statewide Purdue Cooperative Extension Service FACTS System uses this type of simplified accounting system data and formula. It uses a “rent” concept to allocate overhead costs or indirect costs on a square foot basis to crops. The indirect costs and direct costs are allocated to the crop on a per unit basis to determine profit per unit produced.

More detail on the FACTS “Greenhouse Plant Cost Estimation Program” can be obtained from the Horticulture Department, Purdue University, West Lafayette, Indiana 47905 by requesting SB233.

Table 5. An example showing unit cost determination

Crop 2 in <i>Taxus R C</i>	
Space occupied	500 sq ft of bench
Overhead	25¢/sq ft of bench
Depreciation:	5¢/sq ft of bench
Months occupied:	3 months
Materials cost	\$300 (cuttings, pots, soil)
Labor cost:	\$150
500 sq ft × \$ 30 (25¢ overhead + 5¢ depreciation)	= \$150
\$150 × 3 months	= \$450
\$450 + \$300 (materials)	= \$750
\$750 + \$150 (labor cost)	= \$900
	Total Cost
<hr/>	
\$900 – 18,000 pots	= \$0.05 (cost to produce one 2 in <i>Taxus R C</i>)

SUMMARY

The principal reason for being in the plant propagation business is to make a satisfactory profit. Knowing cost of production of items produced and sold is the key to identifying profitable products, making production decisions, and implementing cost control measures. A simple cost accounting system allocates direct materials, direct labor, and overhead costs to a product or crop to provide costs using existing propagation business records. Labor time sheets, materials invoices, crop inventory, and space use serve as the basis of the cost allocation system, rent system, and the crop cost records. These crop cost records show cost, revenue, and profit and allow for comparisons of cost-profit per unit. There are great benefits from this system. Yet it is not costly, uses existing information and, most importantly, identifies cost and profit for each crop.

Tuesday Evening, December 9, 1980

The thirtieth annual banquet was held in the Ballroom of the Copley Plaza Hotel, Boston, Massachusetts.

On behalf of the Society, awards were presented to Mr. Gregory Lloyd, Department of Horticulture, University of Wisconsin, Madison, Wisconsin, for the best graduate student award paper and to Dr Brent McCown who was the advisor for the work presented in the paper by Mr. Lloyd.

The award for the best undergraduate paper was presented to Mr. Daniel Berg, Department of Horticulture, University of Illinois, Urbana, IL, and Dr. Martin M. Meyer, Jr. advisor for Mr. Berg's paper

Wayne Lovelace made the following presentation:

AWARD OF MERIT

Presented by Wayne Lovelace

The recipient of this years Propagator's Award of Merit has been a member of this Society for 18 years. Like many of his fellow plant propagators, he is a graduate of the Horticultural School of Hard-knocks. His early intentions were clearly not horticulture because he received formal training in business administration and had a natural ability for electronics. However, his experiences in a nursery and fruit orchard soon convinced him that propagating plants was both a science and a challenge that made him redirect his energies and talents. His success in the propagation of fruit trees convinced the owners that here was a man who possessed a natural ability. It wasn't long before the fruit nursery and orchard business converted to general nursery stock.