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## Greenhouse Accounting \*

BY A. F. WAGNER

Greenhouses are, in general, operated for growing either cut and potted flowers or market garden produce. These two types of greenhouses present many analogous problems, but it is intended that this article shall cover only the accounting requirements and peculiarities of the producing florist's greenhouse. Furthermore, the retail distribution of the greenhouse product will not be considered, for the retail florist's business presents only those accounting problems usually connected with the merchandising of highly perishable goods to customers who, at least partly, are poor credit risks.

The average floral greenhouse in its accounting aspects presents a peculiar mixture of a farm, an industrial manufacturing plant and wholesale merchandising. The last of these phases demands that most sales be made for cash or a sufficient reserve be set up for bad debts. Except for certain local holidays or festivals which stimulate the sale of flowers, the main selling seasons of greenhouses are Christmas and Easter, the sales for the two months in which these holidays occur often being more than double the volume of sales for the other ten months of the year. Owing to the outdoor growth of flowers in private gardens, the summer is by far the poorest selling season.

In spite of the seasonal nature of the business, there is no time during the year when the floral greenhouse is not producing some sort of a crop in expectation of a future selling season. Were it not for this constant production, a greenhouse could end its fiscal year on the date when no plants were growing, thereby securing a correctly priced inventory and a correct statement for the fiscal period.

We now come to the main difficulty in securing an accurate statement of annual profits and net income; namely, the proper pricing of the inventory of growing plants. The farmer usually

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has all his crops harvested at one season of the year, and can at least price the unsold portion thereof by deducting a percentage from the average market price prevailing for the previous few months. The greenhouse operator, always having some crop growing or "in process," can resort to no such methods, and often inventories growing plants by actually listing the cost of the seeds, bulbs, pots, etc., and making a guess at the cost of the labor and heat which have been expended on unsold plants.

From the above remarks it is evident that no greenhouse can be certain of its annual profits, to say nothing of knowing which crops are or are not profitable, unless its accounting system automatically provides a real inventory of growing plants (work-in-process) at cost. To accomplish this desideratum, it is imperative that the greenhouse accounting comprehend a cost system which is in many ways analogous to similar systems operated by manufacturers. The remainder of this paper will consider the ends to be accomplished by such a system, and, without presenting detailed forms, will endeavor to set forth some of the means of accomplishing these ends.

The advantages of having the cost records "tied up" with the general books need not be elaborated here, for it is sufficient to state that this should be done. However, before proceeding with the planning of any such system, an accurate plan should be made of the greenhouses showing particularly the number of square feet of floor space in each separate unit and, if the buildings are of various heights, the number of cubic feet in each house. Furthermore, the floor space of each structure should be divided into numbered "production plats." After this has been accomplished, no production should commence except when so directed by an order issued in the main office. Each production order should be issued for but one kind of plant or flower and should specify the kind of flower, the number to be planted, the approximate date when production is to be completed, the materials to be used and the house and plat number or numbers of the space to be used in the growth of the particular order. A duplicate of this order can be made to serve as a material requisition. In order that workmen may know at all times the production order numbers of each plat, such numbers, in large type, should be hung above the growing plants. The principal items of the cost

of producing flowers arranged in the order of their usual importance are as follows: labor; heat; bulbs, seeds and shoots; building repairs. Therefore, in determining greenhouse costs, these items, in particular, must be carefully allocated to specific production.

In order that an accurate record of materials used in production and on hand may be obtained, perpetual inventory accounts should be operated under the following main headings: (1) bulbs, seeds and shoots, (2) pots, (3) soil and (4) fertilizers. The operation of the first two of these accounts offers no particular problem. However, the soil account should be segregated into raw soil and fertilized soil. If the raw soil is purchased, its cost per cubic unit is definitely known; but, if dug on the greenhouse premises, a record must be kept of the labor cost of digging and the cubic units dug. When fertilizer is added to soil, a definite amount of earth should be fertilized and thereafter kept on a stock pile separate from the raw soil, the cost of the fertilizer being added to the unit price at which such prepared soil will be charged to production. Because a greenhouse usually sells its product in two forms—namely, cut flowers and potted plants—it will be necessary to keep a record of all pots and soil remaining on hand at the completion of each production order. The unbroken pots should be returned to stock and credited to the cost of the production order at their cost price, and the remaining soil should be returned to raw soil stock and deducted from the production order cost at the average cost of raw soil. This latter price may vary somewhat from the original cost of the raw soil, but such fluctuations will be inconsequential in their total amount.

Direct labor is usually the largest single item in greenhouse production costs and consequently an accurate accounting for the time of all workmen is essential. Each employee should be provided with a daily time card on which he shows all orders on which he has worked and all operations performed during the day, whether they be setting out pots, planting, pruning, watering, cutting, or indirect labor, such as whitewashing or repairing glass. A large greenhouse is spread out over so much territory, and has so few workmen per square foot, that it is impossible for the superintendent constantly to observe the work of all em-

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ployees. Consequently a certain amount of time should be spent daily examining employees' time cards in order to determine whether or not any employees are wasting time.

In designing a payroll book for a greenhouse, it is advisable to arrange the book so that the total direct and indirect labor, both hours and cost, shown on time cards may be proved with the total of each periodical payroll. Some greenhouses specialize so as to have only a few large production orders in process at any one time, in which case the payroll book may be drawn up so as to provide an analysis of direct labor by production orders. The employees in a greenhouse usually have little clerical training; hence all labor records which they are to make should be made as simple and easily understood as possible. However, with proper instruction of employees and with order numbers conspicuously displayed over every production plat, no great difficulty should be experienced in securing an accurate record of labor. In all cases, the actual hours of direct labor expended on each order should be shown on the cost sheets, for such hours are perhaps the best method of apportioning certain indirect expenses.

The indirect production costs in a greenhouse fall naturally into two main classes: the first consisting of heat and building expenses, that is, building services and rent or payments in lieu of rent, such as repairs, depreciation, building insurance and real estate taxes; and the second consisting mainly of superintendence and such indirect labor as does not constitute a building service. Apparently the most equitable way of distributing the first of these two classes is on the basis of square feet occupied by each order, or, in greenhouses of varying heights, on the basis of cubic feet. The incidence of the second class to production is most nearly in accordance with the direct labor hours; however, in some cases both classes of indirect production costs may be equitably distributed to production orders on the square foot basis. When this latter method can be adopted it recommends itself because of simplicity.

Greenhouses often have their main fuel stock in a pile outside the boiler room and maintain an approximate one-day supply in the boiler room. When this is the case, it is fairly simple to keep a record of amounts removed from the main stock and thereby determine a nearly accurate monthly fuel cost. When

this procedure is not followed, other means of recording the quantity and cost of fuel consumed must be devised. In order to determine a correct heating cost, all labor and expense connected with the boiler room or steam plant, including depreciation, should be charged as a heating expense.

Owing to the peculiar construction of a greenhouse, the fixing of a fair depreciation rate is a difficult problem. The glass roof and sides (which form a far larger part of the cost of a greenhouse than do the base and frame) are constantly being replaced. On first thought, it seems logical that the depreciation rate cover only the cost of the frame and base, the repair and replacement of the glass keeping the roof and sides in as good condition as when new. However, there's a rub, for, when it becomes necessary to replace a base and frame, approximately one-half of the glass is broken before it reaches its place on the new frame. Consequently the greenhouse has, roughly, a fifty per cent salvage value in the glass which has been kept in perfect condition at a heavy expense.

The indirect production costs or manufacturing burden of a greenhouse, except repairs, are not given to violent fluctuations but do fluctuate generally with the volume of production. It is, therefore, advisable that the actual manufacturing burden be charged into production orders as incurred from month to month. In order to level the monthly charges for repairs which are generally made during the summer, it is preferable to charge an estimated amount into the manufacturing burden each month and set up reserves for repairs against which the cost of repairs actually made can be charged. If this procedure is followed and all burden is charged to production month by month, there will be no large amount standing on the books at the end of the year representing manufacturing burden over-absorbed or under-absorbed. It is necessary to make annual adjustments for inaccuracies in the original estimates of steam plant and building repairs, but careful planning will reduce such discrepancies to a minimum.

In order to summarize the costs of individual orders, it is necessary to operate a cost ledger and cost sheets in a manner similar to the procedure followed in the cost systems of manufacturers. These cost sheets representing orders-in-process

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should be controlled by a general ledger account, which may be styled "growing plants." Inasmuch as the plants are constantly growing and blossoming until sold or the end of their life, it is impossible to operate any account similar to the manufacturer's account "finished goods." Production in a greenhouse can usually be planned so as to be complete and sold in any one month. When an order reaches this completed state it should be removed from "growing plants" and charged to cost of goods sold. However, cases often arise when prematurely developed plants or flowers are sold long in advance of the final completion of the entire production order. Until the order is completed and sold such sales may be credited to a suspense account such as "invoices rendered on uncompleted orders" and transferred to sales when the cost of production is brought into cost of goods sold. Before finally determining the cost of a specific production, care must be exercised to see that all remaining usable materials have been returned to the proper stock accounts and deducted from the production costs shown on the cost sheets.

If efficiently managed, the selling and administrative expenses of a producing greenhouse should form a small portion of the total expense. For that reason, it does not seem advisable to undertake the clerical work necessary to allocate such expenses to each sale or group of sales. The chief executive, if awake to his position, knows the average percentages of these classes of expense, and can apply such percentages to any order when he so desires. Such expenses will appear separately in the monthly statement of profit or loss, and percentage calculations of these expenses also should be shown on that statement. This method therefore includes only actual manufacturing burden on the various cost sheets, which means that the cost figures must be combined with brains when they are used to determine a selling price.

The foregoing is a sketch of the main points to be considered in devising an accounting system for a floral greenhouse. If properly operated, such a system will not only afford an accurate statement of net income or loss for each fiscal period, but it will also present means of reducing waste of labor and materials and, further, give accurate data as to which are the profitable crops.