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It has been the author's observation that few naval-stores operators keep accurate cost records, or accurate records of any kind. This perhaps is because many of them operate on small capital and their employees have not the proper conception of the value of adequate accounting records. The large producers at first, in many cases, operated also on small margins and carelessness in handling their records is the result of practices of earlier years.

It is the purpose of this paper to submit only brief comments on accounting peculiar to the naval-stores industry, with conclusions based on the author's own experience and upon principles accepted by the internal-revenue department in the computation of net income for income-tax purposes.

Determining the amount of depletion of turpentine leases and depreciation of physical properties presents problems that require a thorough analysis of the cost of these items, together with other factors bearing thereon, if amortization is to be scientifically handled. Proper valuation of inventories is utterly impossible unless necessary cost records are maintained. In many cases, inadequacy of the records compels the internal-revenue department to resort to arbitrary assessments of income tax which often result unfavorably to the taxpayer, inasmuch as complete evidence is not available upon which to base the computation of the tax.

Naval-stores producers usually lease the timber which they operate, though in some cases it is purchased outright. The most common leases are those extending over a period of three or four years from the date of cupping, the cost being based on a certain sum per thousand cups or boxes hung—10,000 boxes being considered a crop. In leasing timber it is customary for the lessee to make an initial payment to the lessor, thereby binding the contract, the balance being payable when the cupping is completed and the boxes counted. Where the timber is bought outright, a large part of the cost is applied to turpentine rights, that being the primary object of the purchase. On leases extending

over a three-year period, the internal-revenue department has agreed in various cases that 45% of the annual crop (valued as shown hereafter) may be charged off the first year; 35% the second year; and 20% the third year. On four-year leases, rates of 35%, 25%, 20% and 20% have been accepted by the department. In order, however, to secure these deductions in preparing income-tax returns, it is evident that taxpayers must provide the necessary information, for submission to the department, through the maintenance of proper accounting records.

All initial lease payments may be charged to one account pending the cupping of the timber and the ascertainment of the total cost. When final payment is made on a lease, this final payment, together with the initial payment, should be charged to an account captioned to designate the class of lease, such as "three-year leases," "four-year leases," etc., together with the number of boxes put up. With this information, computation of the amount to be charged off as depletion is comparatively simple. It may be illustrated on a full crop basis as follows, assuming that at the beginning of the period 8.78 full crops were being operated and that the leases extend over a four-year period:

	Full crops	Amount	Average per crop
Balance at beginning of year	8.78	$15,508.83	$1,758.39
Boxed during year (48,787 boxes hung)	4.88	7,406.97	1,517.90
Totals	13.66	$22,915.80	$1,677.58
Depletion for current year	6.66	11,172.68	1,677.58
Balance at close of year	7.00	$11,743.12	$1,677.58

The balance of 8.78 full crops at the beginning of the year is represented by the following:

7.26 crops of yearling (2d year working) at 65%	4.72
4.65 crops of buck (3d year working) at 40%	1.86
11.00 crops of pulling (4th year working) at 20%	2.20
Total full crops	8.78

It is clear, then, that the depletion, in full crops, to be charged off for the year is readily determined from the data as

follows, being based on the actual number of crops of boxes in operation:

4.88 crops of virgin (1st year working) at 35%	1.71
7.26 crops of yearling (2d year working) at 25%	1.82
4.65 crops of buck (3d year working) at 20%	.93
11.00 crops of pulling (4th year working) at 20%	2.20
Total full crops worked	6.66

Inasmuch as the lease on the eleven crops of pulling expires with the fourth year's working, this item entirely disappears in the following year's operations; the 4.65 crops of buck become pulling; the 7.26 crops of yearling become buck; and the 4.88 crops of virgin become yearling. From this we determine that the 7.00 full crops at the close of the year is represented by the following:

4.88 crops of yearling (2d year working) at 65%	3.17
7.26 crops of buck (3d year working) at 40%	2.90
4.65 crops of pulling (4th year working) at 20%	.93
Total full crops	7.00

If an original purchase is made from another operator and if it includes leases that have been partly worked out, these may be reduced to a full-crop basis, as follows, assuming, for example, the purchase includes eleven crops of boxes that have been worked one year, three crops that have been worked two years and six crops that have been worked three years:

11 crops of yearling at 65%	7.15
3 crops of buck at 40%	1.20
6 crops of pulling at 20%	1.20
Total full crops	9.55

The average cost of the leases worked is ascertained by using the unamortized portion of cost at the beginning of the year, plus the cost of leases boxed during the year, divided by the number of full crops, as shown in the first table above.

It often happens that, after a lease has expired, the land is re-leased for one or two years. In such cases, the additional cost may be charged off equally over the re-lease period.

The physical properties of naval stores producers consist principally of temporary cabins for laborers; galvanized cups and aprons for boxing the timber; trucks and live stock for transporting crude gum to the still; still and equipment; office building and commissary; telephone lines; and tools. When an operation is completed, these assets have practically no salvage value, and, consequently, their entire cost should be written off during the life of the operation on an equitable basis. While a number of operators use a straight-line rate of depreciation, this is neither equitable from an accounting point of view nor for federal income-tax purposes. Approximately three-quarters of the money invested in physical properties is used for laborers' cabins and cups and aprons, none of which has any value when the turpentine leases have expired. Even though adjoining timber may be leased, a new supply of cups and aprons would have to be purchased and additional cabins constructed. In order, therefore, to equalize the depreciation, a crop working basis should be used. Assuming, for purposes of illustration, that an operator purchased from another producer unexpired leases on twenty crops of boxes, of which eleven crops had been worked one year; three crops had been worked two years; and six crops had been worked three years; and, in addition purchased from various parties, leases for 4.65 crops, none of which had been boxed, the number of crop workings would be determined as follows:

	Virgin	Yearling	Buck	Pulling	Totals
For 1st year working.....	4.65	11	3	6	24.65
For 2d year working		4.65	11	3	18.65
For 3d year working.....			4.65	11	15.65
For 4th year working.....				4.65	4.65
Total crop workings..	4.65	15.65	18.65	24.65	63.60

Assuming further, then, that the total cost of the physical properties was $28,000, depreciation for the first year would be ascertained as follows:

	Amount	Crop workings	Average per crop
Total cost, crop workings and average	$28,000.00	63.60	$440.25
Depreciation—first year.....	10,852.16	24.65	440.25
Balance at close of year.....	$17,147.84	38.95	$440.25

The average of $440.25 is found by dividing the total cost of the properties, $28,000, by the total number of crop workings, 63.60, and this average multiplied by the number of crops worked during the year, 24.65, determines a depreciation charge of $10,-852.16. Before computing depreciation for the second year, additions to the properties and additional lease purchases, reduced to crop workings, will be added to the balances and the computation repeated, and so on for subsequent years.

The proper valuation of inventories of a naval-stores producer is a question deserving much attention, particularly when the quantities unsold are substantial. The production consists of spirits of turpentine, rosin and dross, all of which are obtained from the same material (crude gum) and are manufactured in the same process. Dross being a by-product, as in other manufacturing enterprises, its value may be deducted from the total manufacturing cost, and the remaining cost segregated between the other two commodities on basis of the value of each, illustrated in the following manner, assuming that the cost to be segregated is $71,005.23:

	Value of production		Cost of production	Barrels produced	Average cost per barrel
	Amount	% of total			
Spirits of turpentine	$ 35,819.67	34.09	$24,205.58	1,695	$14.28
Rosin.....	9,252.96	65.91	46,799.65	5,857	7.990
Totals.....	$105,072.63	100.00	$71,005.23	7,552	$ 9.40

The above value of production, $105,072.63, is ascertained by using the net proceeds of sales of the portion of each commodity sold, plus the market value of the inventory at the closing date, calculated by grades. The percentage that each bears to the total value of the production is found, and the percentages are applied to the total cost as segregated in column three. Having found the number of barrels produced of each commodity, the average cost per barrel is readily determined. These average costs may then be used for inventory purposes, a method of valuation which has been accepted by the internal-revenue department as being in accordance with section 205 of the revenue act of 1926, article 1617 of regulations 69.

The form of cost-and-yield statement on the following page has been found excellent for practical purposes, especially in comparing one year with another or in comparing one operation with another.

Explanation	Year	Year	Increase *Decrease*
Barrels of crude gum stilled			
Average cost per barrel:			
Labor			
Barrels, heads, staves, etc.			
Other supplies			
Truck expenses			
Stable expenses			
Repairs			
Still expenses			
Total manufacturing expenses			
Depletion of turpentine leases			
Depreciation of equipment			
General expenses			
Total manufacturing cost			
Average yield per barrel—in gallons:			
Spirits of turpentine			
Average yield per barrel—in pounds:			
Spirits of turpentine			
Rosin			
Dross			
Total yield			
Waste			
Total weight per barrel			
Average yield per barrel—in barrels:			
Spirits of turpentine			
Rosin			
Dross			
Total yield			
Waste			
Totals			
Production in barrels:			
Spirits of turpentine			
Rosin			
Dross			
Total production			
Waste			
Total crude gum			

	Year	Year	Increase *Decrease*
Percentage of waste			
Number of crops in operation			
Average production per crop—barrels:			
Crude gum			
Spirits of turpentine			
Rosin			
Dross			
Average cost of finished product per barrel:			
Spirits of turpentine			
Rosin			
Number of men employed			

The average costs in this statement are based on a barrel of crude gum, but some operators use five barrels of crude gum as a unit of cost. This is done because it usually requires five barrels of gum to produce one barrel (50 gallons) of spirits of turpentine, with approximately three and one-third barrels (500 pounds per barrel) of rosin and about 100 pounds of dross.

The methods outlined in this article have been used to advantage by the author in actual practice and have been found acceptable by the internal-revenue department for income-tax purposes.