

# TURPENTINE AND ROSIN.<sup>1</sup>

## INTRODUCTION.

The year ended March 31, 1923, was one of the peak years in the paint and varnish trade; consequently there was a healthy demand for turpentine and rosin, which are used largely in the manufacture of these commodities. The resultant high prices, as compared with those of 1921-22, stimulated the production of both wood and gum turpentine for the season 1922-23, the total reported output being only 1,947,165 gallons less than the reported production for the season 1920-21, the record year since 1914, and an increase of 5,024,661 gallons over the output reported for 1919.<sup>2</sup> The production of rosin was 105,205 barrels less than for 1920-21 and 382,078 barrels more than for 1919.

Besides being used extensively as paint and varnish materials, turpentine and rosin are used in the manufacture of soap, paper, rubber, oilcloth, linoleum, sealing wax, fly paper, printing ink, lubricating compounds, rosin oil, and medicinal preparations, and in cloth printing.

Production of turpentine and rosin (Table 1).—No great increase in the production of turpentine and rosin by the distillation of crude gum is anticipated, but it is rather expected that the production will decrease because of the depletion of the available resinous pine timber—long-leaf pine (*Pinus palustris*) and slash pine (*Pinus heterophylla*)—especially as the industry does not appear to have been placed on a permanent basis in regard to timber supply. The production of turpentine and rosin from wood, however, is likely to increase, as there are vast quantities of resinous logging wastes and tree stumps still available throughout the South.

Production of turpentine and rosin from crude gum (Table 2).—One of the interesting facts brought out by this table is the increase in the production of both turpentine and rosin shown for North Carolina and South Carolina. These two States were the most important producers in the early history of the industry in the United States, and undoubtedly a large part of the crude gum used there at present is gathered from second and third growth timber and from back-boxed timber.

Production of turpentine and rosin from wood (Table 3).—The production of turpentine and rosin by the steam-and-solvent and by the destructive distillation processes has been increasing. In 1921 many of the plants were idle because of the light demand for these products. The output for 1922, however, was the largest of record.

A recent development in this industry is the recovery of turpentine, pine oil, and rosin from sawed yellow pine lumber without injury to the wood fiber by a process of steam distillation and extraction with turpentine in steel retorts.

<sup>1</sup> This is the second of a series of annual reports on the naval-stores industry, compiled by the Bureau of the Census, Department of Commerce, in collaboration with the Bureau of Chemistry, Department of Agriculture. The main difficulty encountered in preparing these statistics was the indifference of some of the naval stores producers to the requests for information. It was evident that the majority of them desired to cooperate to the extent of furnishing reports promptly, but a few of the less important establishments failed to respond to repeated requests, and it was necessary to secure estimates of their production from factors.

<sup>2</sup> The producing season for gum turpentine and rosin commences in the spring, when the sap begins to flow. In order to conform as nearly as possible to the crop year and to make the task of reporting 12 months' activities less difficult for the operators, returns were requested for the years ended Mar. 31, 1913, 1919, 1921, 1922, and 1923. The figures for gum turpentine and rosin for 1919, 1914, and earlier years, and all figures for turpentine and rosin distilled from wood relate to calendar years.

**Stocks on hand (Table 4).**—The decrease of turpentine stocks at the stills was undoubtedly due to favorable trade conditions and the high prices prevailing. Special reports on turpentine and rosin compiled by the Savannah Board of Trade, Jacksonville Chamber of Commerce, Pensacola Chamber of Commerce, and the Naval Stores Review show the receipts at Jacksonville, Savannah, and Pensacola to have been greater in July, 1923, than in any preceding month since January, 1921. Within this period the stocks of turpentine on hand were greatest in December, 1921 (66,965 barrels), and the stocks of rosin were greatest in December, 1922 (349,917 barrels). The stocks of turpentine on hand at these three ports in July, 1923, were 41,285 barrels, while rosin stocks were 219,135 barrels, both these amounts being considerably below the monthly average for the calendar year 1922.

**Number of crops and years worked (Table 5).**—It is evident from the statistics presented in this table that there has been less waste in the gathering of the crude gum since the general adoption of the cup system. The old method of boxing allowed greater proportions of the turpentine to evaporate and of the resin to harden on the face of the tree than when cups are used. Although this gum was usually collected at the end of the season by scraping and a large part of the resin saved, the cup system has proven to be a great improvement. Because of the difficulty in obtaining accurate figures on the number of crops worked, estimates had to be accepted in many cases. It is believed, however, that they are approximately correct and give a fair indication of the results from the improved method.

**Exports (Table 6).**—The exports of naval stores suffered a great setback at the time of the World War and, because of the uncertain business conditions in Europe, have not yet fully recovered. The quantity of turpentine exported, however, was 6.4 per cent greater in 1922 than in 1921 and 4.3 per cent greater than in 1920. Rosin also showed similar increases.

The greatest exports of turpentine, 21,039,597 gallons, were reported for 1912 and the largest exports of rosin, 2,806,046 barrels (of 280 pounds), for 1913. Compared with the figures for those years the exports of turpentine in 1922 show a decrease of 53.1 per cent and the exports of rosin a decrease of 49.2 per cent.

TABLE 1.—PRODUCTION OF TURPENTINE AND ROSIN, FOR THE UNITED STATES: 1899 TO 1922-23.<sup>1</sup>

YEAR. <sup>2</sup>	TURPENTINE (GALLONS).			ROSIN (BARRELS, 500 POUNDS).		
	Total.	Distilled from crude gum.	Distilled from wood.	Total.	Distilled from crude gum.	Distilled from wood.
1922.....	24,252,835	22,394,137	1,858,698	1,651,795	1,499,538	152,257
1921.....	24,770,620	24,328,854	441,766	1,690,971	1,601,624	29,347
1920.....	26,200,000	24,450,000	1,750,000	1,757,000	1,577,000	180,000
1919.....	19,228,174	17,693,841	1,534,333	1,269,717	1,138,660	131,057
1918.....	18,650,000	17,050,000	1,600,000	1,238,000	1,115,000	123,000
1917.....	24,900,000	23,700,000	1,200,000	1,631,000	1,531,000	100,000
1914.....	<sup>3</sup> 27,648,939	26,980,981	575,557	<sup>4</sup> 1,649,160	1,615,643	29,022
1909.....	<sup>5</sup> 29,714,132	28,988,954	706,868	1,827,760	1,827,760	( <sup>6</sup> )
1904.....	31,129,236	30,687,051	442,185	1,964,674	1,964,674	( <sup>6</sup> )
1899.....	37,733,500	37,733,500	( <sup>6</sup> )	2,434,933	2,434,933	( <sup>6</sup> )

<sup>1</sup> The statistics for 1920, 1918, and 1917 were compiled by the Bureau of Chemistry, Department of Agriculture.

<sup>2</sup> The figures showing the production of turpentine and rosin from crude gum for 1917, 1918, 1920, 1921, and 1922 refer in each case to the crop year ended Mar. 31 of the year following. The 1919, 1914, 1909, 1904, and 1899 figures for gum turpentine and rosin and all figures for turpentine and rosin distilled from wood relate to calendar years.

<sup>3</sup> Includes 92,401 gallons of turpentine reported by establishments engaged in the manufacture of lumber and timber products.

<sup>4</sup> Includes 4,495 barrels of rosin reported by establishments engaged in the manufacture of lumber and timber products.

<sup>5</sup> Includes 18,310 gallons of turpentine reported by establishments engaged in the manufacture of lumber and timber products.

<sup>6</sup> Not reported.

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TABLE 2.—PRODUCTION OF TURPENTINE AND ROSIN FROM CRUDE GUM, BY STATES: 1922-23 AND 1921-22.

STATE.	SEASON, 1922-23.			SEASON, 1921-22.		
	Number of establishments.	Turpentine (gallons).	Rosin (barrels). <sup>1</sup>	Number of establishments.	Turpentine (gallons).	Rosin (barrels). <sup>1</sup>
United States.....	1,219	22,394,137	1,499,538	1,418	24,378,854	1,661,624
Alabama.....	163	2,076,931	133,702	206	2,827,782	192,149
Florida.....	431	8,258,899	556,355	490	8,295,850	549,907
Georgia.....	500	7,131,222	467,349	578	7,034,333	485,650
Louisiana.....	31	2,387,745	166,912	28	2,910,163	205,854
Mississippi.....	45	2,013,865	139,159	54	2,660,834	185,375
North Carolina and South Carolina.....	43	354,025	23,701	51	300,266	18,463
Texas.....	6	171,450	12,360	11	346,626	21,226

<sup>1</sup> Includes rosin reclaimed from still wastes or dross.

TABLE 3.—PRODUCTION OF TURPENTINE AND ROSIN FROM WOOD, BY STATES: CALENDAR YEARS 1922 AND 1921.

STATE.	1922			1921		
	Number of establishments.	Turpentine (gallons).	Rosin (barrels, 500 pounds).	Number of establishments.	Turpentine (gallons).	Rosin (barrels, 500 pounds).
United States.....	21	1,858,698	152,257	13	441,766	29,347
Florida.....	4	564,327	45,453	3	93,793	.....
Georgia.....	5	651,734	80,123	3	214,314	24,396
Louisiana.....	4	258,136	8,945	3	83,794	2,801
All other States.....	8	384,501	17,736	4	49,865	2,150

TABLE 4.—STOCKS ON HAND AT CLOSE OF CROP YEARS 1922-23 AND 1921-22, FOR THE UNITED STATES.

	MAR. 31, 1923.		MAR. 31, 1922.	
	Turpentine (gallons).	Rosin (barrels).	Turpentine (gallons).	Rosin (barrels).
Total.....	3,582,768	1,132,505	4,258,387	1,199,007
At stills.....	609,679	474,829	1,036,611	499,797
By consumers <sup>1</sup> .....	838,477	297,843	1,335,838	263,488
At wood-distillation plants.....	299,712	25,063	142,488	19,143
At ports and distributing points <sup>1</sup> .....	1,839,900	334,770	1,743,450	416,579

<sup>1</sup> Compiled by the Bureau of Chemistry, Department of Agriculture.

TABLE 5.—NUMBER OF CROPS AND YEARS WORKED, BY STATES: 1922-23, 1919, AND 1914.

STATE.	Year. <sup>1</sup>	NUMBER OF CROPS. <sup>2</sup>			
		Total.	Virgin (first year).	Yearling (second year).	Pulling (third and subsequent years).
United States.....	1922-23	11,570	2,834	2,388	6,348
	1919	12,141	2,856	2,440	6,845
	1914	18,166	3,190	4,666	10,310
Alabama.....	1922-23	995	213	240	542
	1919	1,385	217	337	831
	1914	1,693	266	460	967
Florida.....	1922-23	4,872	1,158	892	2,822
	1919	5,410	985	954	3,471
	1914	8,950	1,431	1,978	5,541
Georgia.....	1922-23	3,572	879	792	1,901
	1919	3,165	715	643	1,807
	1914	5,044	810	1,327	2,907
Louisiana.....	1922-23	751	213	175	363
	1919	893	569	149	175
	1914	943	307	347	289
Mississippi.....	1922-23	1,097	322	197	578
	1919	822	275	257	290
	1914	1,138	279	402	457
North Carolina and South Carolina.....	1922-23	222	49	64	109
	1919	59	7	12	40
	1914	164	7	40	117
Texas.....	1922-23	61	.....	28	33
	1919	407	88	88	231
	1914	234	90	112	32

<sup>1</sup> The statistics for 1922-23 cover the crop year ended Mar. 31, 1923.

<sup>2</sup> A crop equals, approximately, 10,500 boxes or cups.

TABLE 6.—EXPORTS OF NAVAL STORES: SPECIFIED CALENDAR YEARS, 1905 TO 1922.

YEAR.	Spirits of turpentine (gallons).	Resin (barrels, 280 pounds). <sup>1</sup>	Tar, turpentine, and pitch (barrels, 280 pounds).
1922.....	9,863,979	1,427,097	36,345
1921.....	9,267,959	1,001,542	27,481
1920.....	9,458,423	1,164,328	50,613
1915.....	9,464,120	1,372,316	239,661
1910.....	15,587,737	2,144,318	40,037
1905.....	15,894,813	2,310,275	45,262

<sup>1</sup> The trade unit is an imaginary barrel of 280 pounds gross weight, although resin is actually packed in barrels weighing approximately 500 pounds gross.

<sup>2</sup> Includes 494,576 gallons of wood turpentine. Separate figures for wood turpentine not published previous to 1922.

<sup>3</sup> Tar and pitch, wood.