

Burning in Naval Stores Forest

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BEFORE discussing woods burning in naval stores, what is naval stores? First, be it understood that there are three fields within the activity, namely (1) wood distillation, or the process of obtaining the desired product from pine stumps; (2) the capture of tall oil in the sulfate pulping process, and (3) gum naval stores, or the harvesting of oleoresin or gum from standing, living pine trees, obtained throughout a long working season of some seven months annually. Today, I shall discuss fire in its relation to the gum naval stores business.

But first, how did the activity derive its odd name? There is cause for puzzlement. The story is told—with tongue in cheek—that a Secretary of the Navy, somewhat confused, but firm in his resolve to be prepared, declared: “I don’t know what it is, but let’s get some of it!”

The term is a carry-over from the days of sail. Then the product was in prime demand. It caulked the hulls of wooden ships, and treated rigging against the erosive action of sun, rain, wind, ice, and salt water.

How old is the business? We know that flammable gum featured heavily in the combustibles tossed around in ancient Mediterranean sea fights. Some writers speak with authority that it dates from the year 315 B. C. Others point to the Bible and quote from chapter and verse how Noah treated the hull of the Ark with derivatives from the

forest. Certainly the beginning of the business is buried in deepest antiquity.

When did naval stores first receive notice in North America? In 1586 the report was brought back to Sir Walter Raleigh in England that the New World afforded "pitche, tar, rosin, and turpentine" in great store. By 1606 the French were trying the business in Nova Scotia, but soon abandoned the attempt because of poor yield in an unfavorable climate. Soon the astute English determined that gum yield was high in the warmth of the southern colonies. Our forebears went to work in the woods, and in the South we now have been in the business over 300 years.

In time, North Carolina came to be known as the Tar Heel State, or the acknowledged leader in the production of gum naval stores. With the passage of years, the activity shifted south and west. North Carolina has dropped from the picture. Today "gum is gathered"—to use an old expression—in the longleaf-slash pine stands of the South Atlantic and Gulf Coast states from a corner of South Carolina through Georgia, Florida, Alabama, Mississippi, Louisiana, and into East Texas. Georgia is the big producer, with Florida second and Alabama third.

Now that wooden navies have gone their way, what uses maintain the demand for gum naval stores today? Here, roughly, are percentage figures by broad classifications of uses for rosin: paper and paper size 37%, chemicals and pharmaceuticals 37%, ester gum and synthetic resins 16%, paint, varnish and lacquer 4%, adhesives and plastics 1%, and all other 5%. Gum spirits of turpentine speaks for itself.

How important is the business? Last year 4,622 producers worked 36¼ million "faces" in the belt. Since only a small percentage of the larger trees carry two faces or working surfaces, the number of trees actually in production exceeded 30 million. Thus, gum naval stores is big business in this country.

What of the future of the business? I choose to turn to the best authority at hand, the U. S. D. A. publication entitled *The Outlook for Naval Stores*, dated November 1962. Its conclusions are based on recent studies in this country and abroad. On page 2 is a summary in brief. It states that, to meet prospective requirements in 1970, increases over 1960 production of 6% in gum rosin and 43% in spirits of turpentine will be in order.

How is the gum obtained? By periodically wounding the tree through a system known as "chipping," channeling the slowly dripping oleoresin into cups, collecting the gum in barrels, and delivering the raw product to steam distilleries, where the two major derivatives of rosin and gum spirits of turpentine are processed.

FIRE AND ITS PLACE, PAST AND PRESENT

Now the stage is set to go back to the point of beginning in this country, consider the conditions which prevailed in the naval stores woods at that time, including the use of fire, and bring the picture forward.

We know that fire was common in the piney flatwoods before the advent of the white man. Both lightning and the Indian were responsible. The practice of seasonal burning was generally adopted by the early settler.

In the colonist's way of life there were advantages to be gained in frequently burning the woods. He was an outdoorsman, and annual fires kept the lush woods undergrowth in low control. There was an over-abundance of timber, which precluded any concern for timber-stand maintenance, or regeneration when a segment of the stand was cut. Then as now, this was a land of 12-month fire season, meaning of course that under favorable fire conditions the piney woods burned readily in any month of the year. Of major importance to the settler, then, was a "clean burn" of his holdings, as proof against a day of such conditions that fires lapping in from outside could not be controlled, and accordingly destroy improvements.

Of course, the production of gum naval stores posed a special problem. The crude gum was and is highly flammable. Today when wildfire occasionally gets loose in turpentine woods, the firefighter—noting the boiling up-thrusts of black smoke—can readily recognize from a distance of a mile or more that faces are on fire.

Then the trunk of the tree is enveloped in flame, and the gum on face and in cup is consumed, or fried to the appearance of black glass. The face is deeply scorched, dried, and for the year at least, destroyed. Often, such a fire puts the producer out of business on the property.

In the beginning—and well into this century—the situation of potential fire damage was acute. Then the prevailing practice was to cut deep notches in the bases of the producing trees, termed "boxes."

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They were cunningly devised pockets, expertly fashioned by skilled labor, into which the gum dripped, cumulated, and from which it was periodically spooned or ladled. Unfortunately, these boxes were natural fire-traps, where flames once ignited were difficult to extinguish. They often burned ever deeper into the tree, inviting decay, insect attacks, and at times outright death.

What then did the manager of the property do to reconcile burning on the one hand and protect the naval stores investment on the other? Using the abundant, cheap labor which long prevailed, he "raked the faces." This consisted of raking a circle around each worked tree of a radius sufficient to remove all endangering flammable debris, particularly the accumulation of dry pine needles.

For centuries this system of raking and burning was used, or until the day when the big virgin timber was gone. The second-growth timber which followed was not of a size to admit chopping deep boxes at the bases of individual trees. Research introduced the clay cup, and later the more efficient metal cup, common today. Equipment costs rose sharply, as did the cost of labor. No longer could the manager afford to periodically rake the faces as often as a shower of dead needles, released by the latest storm, carpeted the forest floor and dried sufficiently to burn readily. From that time on, his burning practices demanded adjustment.

This became a time of change. We are still in it, and are striding with 7-league boots of progress in forestland management. The many demands on such lands for wildlife, recreation, wood, water, and forage have created a new order, and are cementing an appreciation of common goals, undreamed of a generation ago.

At that time, in the strictly wood field of the longleaf-slash pine belt, for example, naval stores and sawtimber competed for dominance. In the interim, the giant pulp and paper industry has entered the picture. On first consideration, it could be assumed that a 3-cornered fight to the death must result. Happily, such has not proved true. A pulp company is now the largest gum producer in the United States. A resin concern, with extensive holdings in the southern states, established its woods business years ago on a foundation of gum production. Today, however, it reports that profits from naval stores on its properties are second to those from the basic resource of wood.

These examples point up the fact that the owner of the timber is

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Fig. 1. The timber has gone to market after yielding its "second pay-day first" from gum harvested in the woods. Exclusion of fire during the naval stores operation insured that there would be no reduction in the selling price of these "faced" tree lengths.

U. S. Forest Service Photo.

fast becoming the referee in this competitive field. He calls the shots when he will. As his skills increase in the production and marketing of the multiple products to be skillfully harvested from his forestlands, his appreciation for the various profitable outlets now afforded, increase accordingly.

Naval Stores, and the attendant tool of prescribed fire, remain very much in the picture. Now on intensively managed lands the longleaf-slash pine timber, ticketed for removal, is identified some years in advance of harvest. If sizes and numbers of trees are sufficient—and both available labor and markets are favorable to the undertaking—the tract is then worked for gum on a rapid-chipping schedule. Thus the derivation of the expression "the second pay-day first," or the gathering of the gum in advance of cutting for wood products.

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The techniques of gathering gum have changed. Efficiency and full utilization are now the rule. No longer does the chipper deeply wound or gouge the living tissue of the tree every week, and so mutilate a section that it must be “jump-buttet”—the trade name for discard—when the tree goes to market. Twenty years ago research introduced sulphuric acid spray, which keeps gum producing resin ducts open two weeks or longer, and developed the bark hack. This instrument, as its name implies, removes only streaks of bark, and thus eliminates mutilation of saleable wood fibre. Today, the producer is rare who does not employ the modern techniques of bark chipping-acid stimulation in his work.

In the current management scheme involving gum production, the use of fire is prescribed in orderly manner. It is applied under exacting



Fig. 2. The tree lengths have been processed to quality poles. The slight discoloration at their ends is remindful that each stick, protected by an initial prescribed burn of the property, yielded gum for four years while it stood as a tree in the forest.
U. S. Forest Service Photo.

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conditions in advance of hanging the cups. It is then rigidly excluded during the period of operation, termed the cycle, which consists of a number of years. Be it remembered that the exposed face or working surface is highly flammable, that modern hardware—such as metal cups and aprons—can be damaged or destroyed by excessive heat, and that costs of effective raking today are prohibitive.

If a repeat cycle of naval stores is to follow, the usual procedure is to cut the worked-out timber in the winter and allow the accumulated debris to dry for a season. A prescribed fire is then applied in the fall, after which the new timber is hung during the winter and initially cupped the second spring. Again, fire is necessarily excluded for the period of the cycle.

SUMMARY AND CONCLUSION

The change from the old order in the naval stores belt was brought about by the iron hand of economics. Tradition—tracing back to the first white settler and the Indian before him—dictated that annual fires must apply in the southern pineries. At a cost of great labor in raking, the tradition was obeyed by gum producers until protection costs on the one hand and value losses on the other became prohibitive.

Research introduced prescribed fire, periodically applied, and the philosophy of timber management tailored to cycles and rotations, expressed in terms of years. State and federal agencies—and industry too—have combined through their protective organizations to markedly reduce the toll annually taken by wildfire.

It is reasonable to assume that prescribed fire will maintain its place in the naval stores woods. While making individual trees accessible through reduction of rough, its use is insurance against the unexpected wildfire which might otherwise blow in and wipe out the operation on any day within the 12-month fire season. In this ancient business, prescribed fire is accordingly a tool of highest value today.