

Silvicides As An Aid In Hardwood Management

Interest in hardwood management has expanded tremendously in the past few years. Land managers have realized that the valuable species—those that produce much of our veneer and furniture wood—are not reproducing themselves. Existing stands are poorly stocked, full of culls and diseased trees, while good trees or logs

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Of the many questions surrounding hardwood management, one of the biggest is how to control unwanted vegetation that competes with the tree species we want to grow. For years silvicides have been used to kill hardwoods in pine stands. But killing or retarding some hardwoods for the benefit of others makes the problem more difficult.

To get down to cases, what chemicals do we use, and when and how do we use them? Forestry research does not have all the answers, but we are able to prescribe the use of two of the most thoroughly tested chemicals with a reasonable degree of confidence. These silvicides, 2,4-D and 2,4,5-T, have been and remain the mainstays of our chemical arsenal. They have been in use almost 20 years, their strong and weak points are generally known, and they are relatively inexpensive.

The chemical we choose and the method to apply it depend largely on the size, number, and distribution of stems to be killed. On the Hitchiti Experimental Forest near Macon, Georgia, we have found that small stems—usually elms, red maple, and dogwood—can be readily killed by basal spraying with a mixture of 2,4,5-T esters in diesel oil or kerosene. Getting rid of such small trees and shrubs makes it possible to regenerate the valuable hardwoods and prevents the weed species from seizing the site and turning it into a brush field.

When the stem is over 2 to 3 inches in

diameter, basal spraying becomes too expensive. However, experience on the Bent Creek Experimental Forest, in the Appalachian mountains near Asheville, North Carolina, has shown that either one of two kinds of tree injector can be successfully used for larger stems. The unmetered type dispenses a solution of 2,4,5-T esters in oil; the newer metered type dispenses a smaller quantity of undiluted 2,4-D or 2,4,5-T amines. Both injection tools have proved reliable and effective for getting rid of large unwanted stems.

Although the basal spray and injection methods are well suited for treating single stems, they are relatively expensive for treating many stems per acre. When clumps of brush are to be killed, or an entire understory is to be deadened, a mist blower can be used.

To eliminate an understory in a 90-acre tupelo swamp in coastal South Carolina so that tupelo regeneration techniques could be tested, an oil-water emulsion of 2,4,5-T esters was applied with a tractor-mounted mist blower. The competing vegetation was killed. For smaller areas, many foresters have found the one-man mist blower very useful. Like the larger mist blower, it commonly applies 2,4,5-T esters in oil-water emulsions, and has been used in the mountains, the Piedmont, and the Coastal Plain. The portable mist

Robert Romancier's recently published paper, "2,4-D, 2,4,5-T, and related Chemicals for Woody Plant Control in the Southeastern United States," gives further details on the use of silvicides in land management. It is Report No. 16 issued by the Georgia Forest Research Council, Macon, Georgia, in cooperation with the Southeastern Forest Experiment Station, U.S. Forest Service.



Tree injectors using undiluted 2,4-D or 2,4,5-T amines provide low cost cull tree removal

are becoming harder and harder to find, and command premium prices.

Unlike the pines, which are often grown in uniform stands by the square mile, stands of the better hardwoods are generally less uniform, smaller in size, and found in mountain coves, on lower slopes, along streams, and in swamps. The greatest financial return for an investment in hardwood management results from growing the better hardwood species on the more productive sites.

blower is a very flexible tool; silvicides can be applied to large areas or specific trees and shrubs.

These silvicides can also be cheaply applied by helicopters or airplanes, and have given good control of large acres of brush and weed trees. But we lose selectivity, with the result that any and all hardwoods in the area are liable to be killed. Hardwoods usually grow in patches, on steep terrain, and along streams, so that aerial application of silvicides is likely to be of very limited use to the hardwood manager. Although aerially applied silvicides seem to have no directly harmful effects on wildlife, broadcast spraying of many continuous acres may disrupt wildlife food or cover conditions.

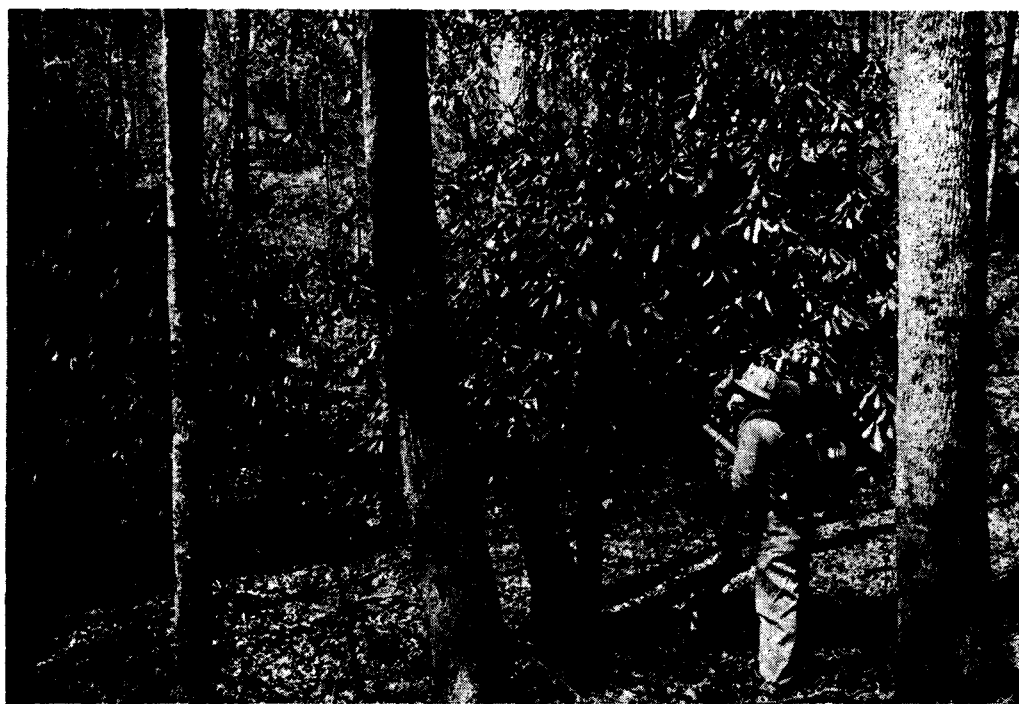
In addition to 2,4-D and 2,4,5-T, a number of newer chemicals have appeared. A few have already fallen by the wayside, some are just too new to be commercially available or recommended, but others continue to look promising. Some of the newer chemicals being actively tested today are fenuron (marketed as Dybar), picloram (marketed as Tordon), cacodylic acid (marketed as Ansar 160), bromacil (marketed as Hyvar X), isocil, paraquat, and dicamba. Time and study will be needed before we can advise how any of these will fit into the practice of hardwood management, but a few tentative leads can be offered.

Fenuron, which has given good control of unwanted turkey oak on pine sandhills, does not appear to harm yellow-poplar at the usual dosages. Fenuron is applied to the soil in pellet form, and so might be used to release yellow-poplar from the competition of oaks and less valuable hardwoods.

Picloram is a versatile new chemical which can be sprayed on foliage or injected into stems or applied as soil pellets. As pellets, picloram (like fenuron) appears selective to a certain extent, and might be used to release oaks and yellow-poplar from maple, dogwood, or sweetgum competition.

Cacodylic acid is being tested for injection uses, while bromacil is being evaluated for foliar, injector, or soil application. Isocil is applied to the soil. Paraquat is currently being tried as a foliar spray and as an injection chemical, as is dicamba.

Other new chemicals on the scene, mainly for foliar application, include 2-(2,4-DP), 2-(MCP), MCPA, 2-(2,4,5-TP), and 4-(2,4-DB). These are so new, or so limited in usefulness, that at this stage we need to learn more about how to use them and for what specific purpose.



Using back-pack mistblower to control rhododendron thickets, thus permitting natural regeneration of valuable yellow poplar and oak species. Below, a tractor-mounted mistblower applies 2,4,5-T for understory control on large area



Land managers or foresters, then, have some valuable aids available for intensive management of hardwood stands—both in the kinds of chemicals and in the methods of applying them. In other words, the treatment can be tailored to the problem. Despite the multiplicity of chemicals now on the market, most foresters will probably continue to rely on the two estab-

lished silvicides—2,4-D and 2,4,5-T—and wait for more complete testing of the newer ones. Or, if they wish, they can do a little experimenting of their own, and find out what works best for their particular situations. Either way, foresters can benefit from the wise use of silvicides in hardwood stands.