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HERBICIDE TREATMENTS Can Improve Your Forest

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When you plant a young pine stand after harvest, you mimic nature's seeding of the area. Then we often stand back and let nature take its course. Newly planted seedlings must divide their meager energy on two battlefronts: They must push and weave their roots through the tangle already there. At the same time, they must precariously struggle up through layers of grass, forbs, shrubs, vines and hardwoods.

By nature's way, the grasses and forbs will be shaded out by the trees and fade away in a few years, but not before they have slowed growth of the young trees. Most shrubs will eventually be remembered only by long-lived seeds in the duff, but not before they rob precious soil moisture from drought starved pines. Hardwoods and pines eventually remain to fight for a place in the sun, and only a few will survive. But which few?

How much easier it would be for the crop pines, if this early competition was lessened and natural processes hastened. With a little help, in only five years, free-to-grow pines could stand 15 to 20 feet tall. If left to nature, they may stand only 6 to 12 feet tall, if they have survived at all, with more hardwoods yet to be faced.

Modern agriculture has shown us that crop yields can be greatly increased with weed control treatments, and this is just as true for forestry. Selective removal of unwanted vegetation can be beneficial to managing any type of forest — pine, hardwood and pine-hardwood. The treatments we use must be in harmony with natural ways for a successful outcome. The methods must be fairly easy to apply or available through reliable contractors. The methods of selective removal discussed here use modern herbicides that have been developed and tested for your safety and safety of the environment as a whole. Many do not believe this last part, but it is true, when used properly — herbicides are safe forestry tools.

Herbicide Treatments are Wise Investments

Many wise forest managers reinvest some of the harvest returns in improving the next stand. For example, they may apply treatments for site preparation, herbaceous weed control or timber stand improvement. Many of these treatment investments are partly tax deductible under the forestry tax incentive program, which further enhances the return on these long-term investments.

Herbicide treatments have projected rates of return from 6 to 13 percent real interest. These rates apply for pine plantation establishment on medium to high site quality lands. As with all forestry investments, rates of return decrease as site quality decreases. But on some lower-quality lands with sandy soils and abundant weeds and hardwoods, use of herbicides may be necessary just to establish and maintain a fully stocked stand, which is essential for optimizing forest investment returns.

While grass and forbs rob early growth from pine seedlings, competing hardwoods subtract growth later in the rotation. Competition between pines and hardwoods usually becomes most evident when stands are 10 to 15 years old. Economic damage, however, actually begins much earlier. Thus, it is best, easiest and cheapest to control hardwoods and shrubs when they are small. Best returns come from site preparation treatments before planting, and to a lesser extent, release treatments within the first two years of stand establishment. Multiple benefits of selective removals in hardwood management have been shown by many research studies but the rate of return on these treatment investments have not been projected.

Young pines usually have excellent survival in stands where weeds and hardwoods have been effectively controlled. They also have some degree of added wildfire protection. These trees grow faster and the crowns close sooner. This means that fewer trees can actually be planted, early commercial thinnings can be planned and rotations shortened. Fewer trees decrease the planting investment, thinnings provide early returns, and a shortened rotation gives the biggest pay back. In conjunction with such treatments, it is most important to plant good quality seedlings and to plant them correctly. Unlike the rapid growth of free-to-grow quality seedlings, poor-quality seedlings will not respond greatly to improved growing space.

Unfortunately, herbicide treatments do not always result in increased growth. It is even known that herbicides fail to work sometimes for unexplainable reasons. Some risk is involved, which can be minimized with proper planning, herbicide selection and application. First and foremost, the treatment must control

undesirable or target plants to a level where crop trees have space to grow faster. For this successful outcome to occur, the correct herbicide must be applied at the best time and uniformly at the prescribed rate. Take no chances! A knowledgeable herbicide prescription and careful application are needed.

Remember, that when planning a herbicide treatment investment, always get the best herbicide for controlling the specific species of competing plants growing on your tract. Different herbicides control different plants differently. This means that it is essential that you or your representative walk over the tract and make a list of the five to ten most abundant target species. From your forestry extension specialist, state forester or consulting forester, find out which herbicide and application method will do the best job of controlling these species. Get two opinions. Then get price quotes from several sources for these specific herbicides and applications. A cheaper alternative is not a bargain if it doesn't control the competition.

How to Improve Your Forest Using Herbicides

Here are some ideas on ways you can improve your forest or stands by using herbicides:

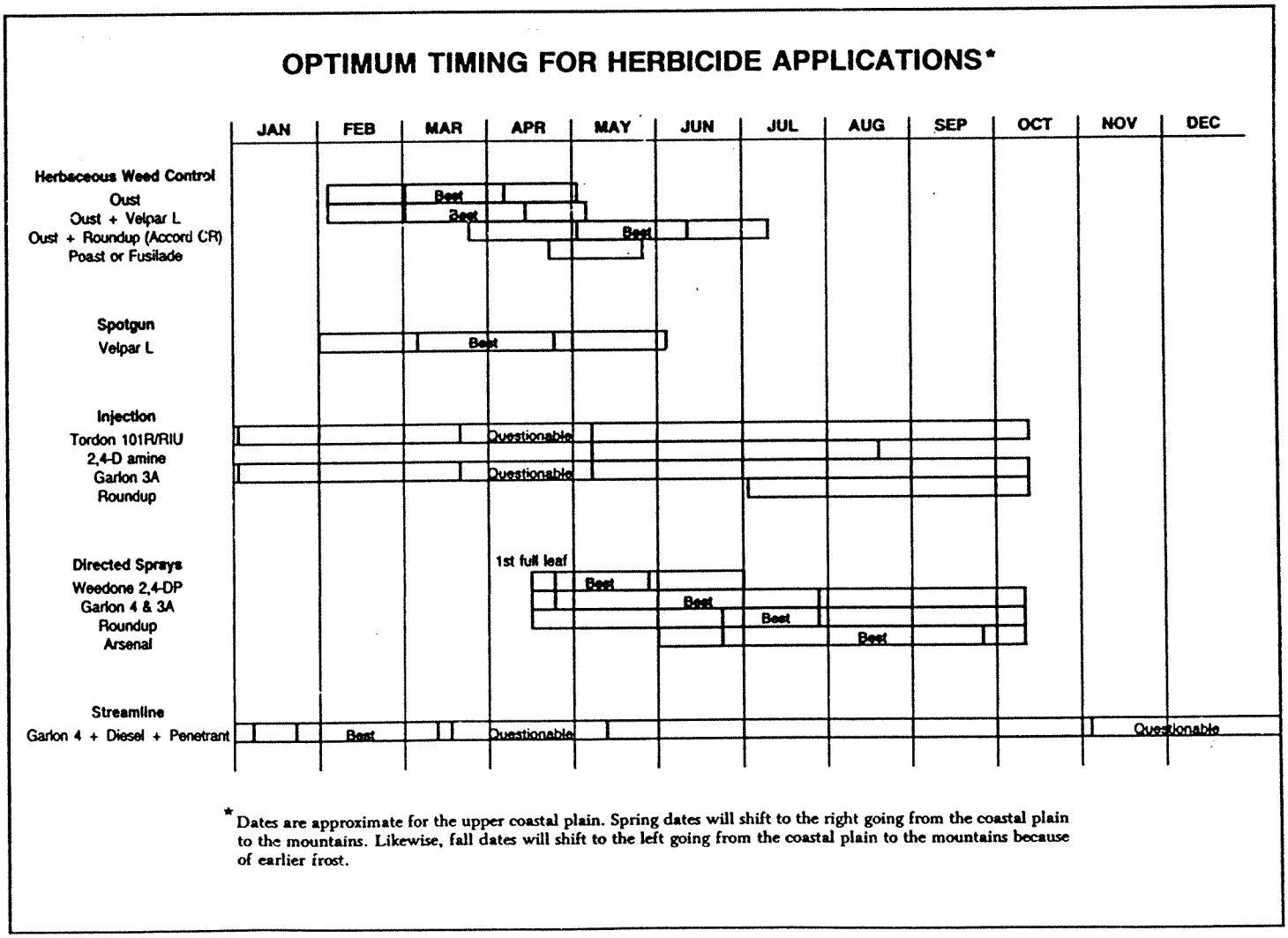
- After a harvest, use herbicide treatments to prepare the site for your next forest.
- Control herbaceous weeds to increase survival and growth of newly planted seedlings.
- Do sanitation removals of cull, diseased and wolf trees after partial harvests and at any other time.
- Eradicate infestations of kudzu, privet, grape, wisteria and other imported pest plants.

These are some basic ideas. There are other possibilities, but let us discuss each of these further.

Site preparation after harvest. Woody plants, especially hardwood sprouts, can outgrow pines and shade them out of the stand. Herbicide treatments, with or without a good prescribed burn, can be more effective in controlling these hardwoods than land clearing or chopping and less damaging to the topsoil. New, effective herbicides for woody plant control can be applied in the growing season before winter plantings of either pines or hardwoods. These herbicides can be applied alone or in combinations, either by helicopter or ground methods.

The most effective liquid herbicides currently labeled for site preparation are listed below, with the names of their manufacturers:

- Arsenal Applicator Concentrate, made by American Cyanamid.
- Accord and Roundup, made by Monsanto.
- Garlon and Tordon in mixtures, made by Dow.
- Velpar L, made by Du Pont. (Granule and pelleted herbicides are also available.)



* Dates are approximate for the upper coastal plain. Spring dates will shift to the right going from the coastal plain to the mountains. Likewise, fall dates will shift to the left going from the coastal plain to the mountains because of earlier frost.

- Pronone (the same active ingredient as Velpar), made by Proserve.
- Velpar ULW, made by DuPont.

Some of these herbicides even provide first-year weed control of forbs and some grasses on specific sites even though they are applied the summer before planting.

New "turn-key" programs are being offered by major herbicide producers in some areas. All aspects of the application are handled by a company representative and more small tracts are being treated. Thus more forest farmers now have the option of using helicopter treatments at reduced costs. Many of these programs have guaranteed results, a great new feature. If you are planning to clearcut harvest or convert low-valued hardwood stands, check with your state forester, consulting forester and herbicide salesman to learn more about these new programs.

If you go directly through a helicopter applicator, get a reputable company with credentials and insurance. You want to get what you pay for, and that usually means maximum hardwood control for the price. Get the most control of target plants for your money. This requires a uniform application of the prescribed rate with a minimum amount of skips.

Young pines usually have excellent survival in stands where weeds and hardwoods have been effectively controlled.

Besides helicopter applications, several ground methods can be used to apply herbicides on some sites, such as small, irregular tracts. You can contract to have this work done or do it yourself to lower costs and for the satisfaction. Possible treatments, which can be used singly or in combination are:

- Tree injection in trunks over 2 inches diameter breast height (d.b.h.).
- Basal sprays of Garlon 4 in diesel fuel for stems less than 2 inches.
- Backpack foliar sprays for hardwoods and pines that are less than 6 feet tall.
- Spotgun treatments with Velpar L to control some species of all sizes.

These methods can be used for site preparation, release and other treatments that will be discussed.

All herbicides must be applied at the right time to be effective. Table 1 shows the preferred timing for several ground application procedures. Some contractors with tractor sprayers and pellet spreaders can also be hired for site preparation treatments and to control kudzu and other weeds.

Herbaceous weed control. Abundant roots of grasses and broadleaf plants rob needed water and nutrients from tree seedlings. With weed control in the first year, early pine growth often can be doubled in the best cases. Products like Oust (Du Pont), Velpar, Atrazine (Du Pont), Roundup and Arsenal can be applied in 4- to 5-foot-wide bands or spots over planting rows. This type of application greatly reduces herbicide costs compared to broadcast treatments. The applicator, using either tractor or backpack sprayers, must consistently and uniformly apply very specific rates — calibrated equipment is a necessity. A quality application is needed to maximize weed control while minimizing crop tree damage from the herbicide.

All of the herbicides mentioned can damage or kill seedlings if misapplied at too high a rate or over trees that are unhealthy or poorly planted. Other factors besides the herbicide appear related to the high mortality found in plantings in the lower coastal plain on lands in the Conservation Reserve Program. Factors such as nematodes, disease and poor planting are suspected.

Sanitation removals. Quality pines and hardwoods can be released, diseased trees eliminated, openings created for regeneration, wildlife plants given room, flowering trees and shrubs encouraged, and much more, by killing unwanted trees with herbicides or by cutting. Cut stumps can even be treated with herbicides to check resprouting.

Tree injection, applied with an injector or a mere hatchet and squirt bottle, can take out large trees of almost any size. Next to chain sawing, this is the cheapest and easiest way to eliminate large wolf trees, forked trees and diseased trees from your stand. Remember that tree injection treatments are not always effective when applied during droughty periods. Furthermore, no one herbicide will control all species. Injection at its best is only 65 to 85 percent effective.

Basal bark sprays, using Garlon 4 in diesel fuel, is easier to apply than tree injection but is more expensive. This treatment is effective on many small stems that are difficult to inject and on some large trees as well. Yellow-poplar, loblolly pine, sourwood and many waxy leaf species are not controlled with this method.

Eradicating weed infestations. Some weeds such as kudzu, privet and mimosa, just get worse if left alone. You can keep paying taxes on weed infested land, and keep going in the hole, or you can eradicate the pest and plant trees that provide a net profit. But when eradication treatments are started, stay with it, every single sprig should be eliminated through broadcast and follow-up spot treatments. If not, the infestation can come back. It is somewhat like declaring war, but the pest plant doesn't have a chance if you get the right allies.

The right allies include the most effective herbicide labeled for that pest plant under your use category and a knowledgeable, experienced contractor to treat the infestation. You can treat it yourself if you have the required spray equipment and can learn the proper method. Whatever your approach, your own attitude is the most critical factor: You must have determination. It will take more than one application, probably several, to eradicate any full-fledged, hearty weed. The initial treatment will be the most difficult and then it may get somewhat easier.

Herbicides should always be handled and applied with thoughtful care and according to label directions.

Safety: First and Foremost

Herbicides should always be handled and applied with thoughtful care and according to label directions. When filling equipment and during application, always use and wear safety equipment specified on the label. Extreme care is needed when filling equipment so that there is no possibility of contaminating wells and surface waters. Always thoroughly read, understand and follow the most up-to-date label.

Herbicides are Safe

The Environmental Protection Agency oversees the extensive testing and regulation of our agrichemicals, including forest herbicides. They scrutinize all the facts and grant registration only when a product has met all the safety standards — safe for the applicator and the environment. Proper-use guidelines are spelled

out on the label, which is a legal document that must be strictly followed whenever you use any pesticide.

Forest herbicides are required to undergo much more detailed environmental testing than crop herbicides. Besides normal testing to determine toxic levels on game birds, fish and other animals, researchers determine what happens to the chemical when it is aerially applied onto forested watersheds. Where does it land? How fast does it break down on the foliage and forest floor? How much enters streams and ponds? How does it break down? Answers to these and other questions must meet very demanding standards before any chemical or method of use is approved. Of course, all herbicides sold in the United States are rigorously tested to make certain that none cause cancer, tumors or birth defects in humans and other mammals.

Few people realize what light coverage is given when a helicopter applies two gallons of herbicide to the acre, which is a common rate. That quantity results in an average of only four drops of the actual chemical landing on any square foot of land. Remember, that square foot could be covered by several layers of vegetation as well. These sparse quantities are like four needles in a haystack of natural chemicals. Their total addition to nature is very small, but because these herbicide molecules have been chemically designed to control only plants — not squirrels, deer, fish or humans — they can take out even the largest tree, without disrupting much else.

The vast majority of any applied herbicide is broken down to its basic elements within a few months after application. The breakdown occurs through action of sunlight, water and the billions of microbes in the soil (herbicides are biodegradable). Soils bind most herbicides, greatly slowing or halting downward leaching. With proper rates of application, stream water and groundwater contamination should not be a problem with forest herbicides, especially since applications are required only once or twice in a rotation.

For more details on specific herbicides, contact a knowledgeable extension specialist and the herbicide company representative. Remember that the first ingredient of a spray program is you, the landowner, learning more about your management options with forestry-use herbicides. With carefully gained experience, you can be an effective vegetation manager with nature.

Discussion of herbicides in this article does not constitute recommendation of their use.

The use of trade or firm names is for the reader's information and does not imply endorsement by the U.S. Department of Agriculture or Forest Farmers Association of any product or service. □