What The User Needs In

Tree Characteristics

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As a field forester, I appreciate this opportunity to speak with you, and to share a couple of thoughts. Planting is one of the most important aspects of our profession. (As goes the planting, so grows the forest.)

My background is largely in reforestation of, and conversion to, certain shade-intolerant species in southern Wisconsin. In order to broaden my basis for this talk, I have sent out a survey to other foresters in the state, regarding their opinions of planting stock. I'll begin by highlighting the results of the survey, then will add a few of my own thoughts, more specific to the work that I do.

Survey

The survey was sent to most DNR and Consulting Foresters in the state. It covered stock quality, packaging, shipping, viability, supply, and cost.

1. Stock quality is generally considered good. Problems noted have to do with stock size and balance:

    a. Larger seedlings, especially larger root systems, cause some planting problems.

    b. The root-to-shoot ratios are considered quite important. Top-heavy conifers seem to be especially risky.

    c. When foresters plan our planting projects and estimate costs and charges, we envision a certain size of seedling. Substantial variability from one nursery to another, from one year to the next, or within a given bed can cause problems with logistics and costs. (Sorting by size would help.)

2. Over the last several years, Wisconsin has used bags, bales and boxes. The overwhelming opinion is that bags shouldn't be used. They encourage rougher handling, result in bruised stock, and when piled, are subject to overheating. Open-ended bales don't fare much better, and are prone to excessive drying. Boxes with plastic liners are preferred by virtually everyone.

    Wisconsin also offers an option of counted, culled seedlings; or bulk, bedrun seedlings at a lower price. The actual count of a bulk order can be off in either direction, especially with hardwoods. Since many private

landowners don't count their stock, they may not be aware of the variance. Culling is poorly understood by private landowners and by some planters. If they are unwilling to throw away any live seedlings, many inferior trees may get planted. Counting, culling and sorting are more easily done at the nursery, and will afford greater certainty of quantity and quality.

3. Packaging and shipping should be as prompt as possible. Foresters are generally pleased with packing and shipping schedules. A few comments suggested that the shipping schedules could be more attuned to local planting conditions. While we recognize the complexities of coordinating your planting season, we also appreciate any accommodations in the rescheduling of orders.

4. Initial viability of the stock, as it comes out of the nursery beds, seems to be excellent. Most viability problems stem from packaging, storage, handling, or planting practices. Good packaging and prompt delivery will help. The rest is up to us in the field.

5. Certain hardwoods seem to be in short supply in Wisconsin, and they sell out quickly. This is due in part to inconsistent seed supplies, and in part to increasing demand for hardwoods. The Federal Conservation Reserve Program has been a major consumer of seedlings, and is applicable to a portion of the state which is more suited to hardwoods. The CR Program will cause excessive demand for a couple more years. Thereafter, the demand may still be higher than in the past, as more people are taking an interest in Oak reforestation and species conversion.

6 Costs are considered reasonable by most foresters. Landowners don't seem to shop around, and tend to accept whatever price is listed. As long as ASCS cost-sharing rates keep up with increased seedlings costs, price increases shouldn't impact too severely upon landowners' costs, nor upon demand. I would prefer to see the emphasis remain on quality, rather than on cost reduction.

Conclusions: Field foresters appreciate the difficulty of managing a nursery operation, and recognize your efforts in providing good products. The greater the communication we have over the years, the better our planting success will be. It wouldn't hurt to talk to your field foresters at the end of each season; to ask us what was good or bad about your product, and to tell us of your needs and concerns.

<u>My Perspective</u>

My planting work varies substantially from that of many other foresters. I am primarily concerned with the regeneration or establishment of certain shade-intolerant species (primarily Walnut and Red Oak). I work in a region of the state which has good silt loam soils and a good climate for high value hardwoods. *We* have historically produced some very fine hardwoods stands, which can be worth several thousands of dollars per acre, and which can justify substantial reforestation and management costs.

Unfortunately, the future is not as bright as the past. The more valuable species can't regenerate in their own shade, and the forests are being taken over by more shade-tolerant, inferior species. Because of the domination of private ownership and the independence of timber buyers, most timber is sold without the involvement of a forester. The resultant high-grading of the forests (the harvest of only the more valuable trees) causes further deterioration of the resource. In many cases, a heavy understory and/or brush will further complicate the matter.

The only practical scenario of reforestation seems to be:

1. Spray the brush in the previous summer;

2. Plant in the spring following spraying;

3. Inject the unmerchantable trees with herbicide;

4. Harvest the merchantable stems.

Once the overstory is removed, the area will be reclaimed by seeds and brush, despite the spraying. But if we can establish fast-growing seedlings, they can keep up with the other regrowth, and eventually dominate the forest. This will require greater numbers of seedlings, available in the opportune year (tc coordinate with spraying and harvest), with adequate personnel available for spraying, hand planting and injecting. The seedlings must be large, healthy and capable of growing rapidly following planting. Slow-growing seedlings will be choked by the regrowth, and will cause the entire project to fail.

Walnut seedlings can begin rapid growth in their first year, and seem to fare well under this management package. However, they die quickly under shade, and must be given full sunlight from the start. I have had better success with taller Walnut stock. This may be due, in part, to genetic superiority, which caused faster growth in the nursery. It may also be due to the initial height advantage which they have over the reencroaching weeds and brush. I also look for numerous lateral roots. Much of the tap root is lost in lifting, and I feel that the laterals aid in the first year's growth. It has been suggested by some foresters that larger caliper of the tap root is also an advantage.

Oak seedlings have a reputation for slow growth in the first few years of life, and many Oak plantings have been lost due to the Oaks' inability to keep up with the rest of the woodland growth. It seems that Oak seedlings need some time to get their roots established before putting on substantial shoot growth. The Oaks can survive for several years under shade, but will never develop much shoot growth unless they have a lot of sun, and there isn't much sunlight on the forest floor after a couple years of regrowth. I look for older Oak seedlings, 2-0, 3-0 or transplants. I am convinced that larger caliper makes a difference in Oaks. I also believe that numerous lateral roots are essential for rapid growth in the first couple of years. (Since the Oaks should be grown in the nursery for at least two years, it would be possible to root prune after the first year's growth. This should stimulate laterals, and may result in less tap root to be dealt with when the seedlings

are lifted for planting.) I also feel that taller shoots at planting time may help get the first year's leaves above the brush and weeds.

While my work is largely with Walnut and Red Oak, I feel that the same considerations should be given to other valuable species, especially those less tolerant of shade.

Genetic improvement is always important, and may be more so for these hardwoods. If we could establish seed sources which produce faster growth in the first years, or which tolerate more shade and competition, we would substantially improve our chances of reforestation success. At the very least, we should be collecting seed from tress with better phenotypes, or from trees with proven progeny. We have been a Red Pine state for too long. Genetic improvement of hardwoods is finally underway, and I'm looking forward to the results.

As larger stock is developed for this type of reforestation work, and as we plan more of these projects, it is important that those seedlings be available for their intended use. In Wisconsin, we have just begun to produce 2-0 Oak in the last couple of years. It is desperately needed for woodland planting, as the 1-0 stock can't compete with the brush. A survey of 1987 planting of 2-0 Red Oak showed that nearly 100% of the 2-0 stock was planted in open fields. The cost of the 2-0 is higher, but the survival is no better, and there doesn't seem to be any reason to plant 2-0 in open fields. More discouraging still, was that 847 of the purchasers chose 2-0 over 1-0 at the recommendation of their forester. The 2-0 stock sold out very quickly, and those of us who needed the larger stock couldn't obtain it. Once you develop superior stock for certain uses, it should be reserved for the sites where it is needed.

Tree shelters are plastic tubes which are put over the seedlings at planting time. They protect the seedlings, provide something of a greenhouse effect, and seem to force faster shoot growth as the seedlings reach for sunlight. They are relatively new in this country, but seem to have enjoyed success in Europe. While the planting costs per seedling will increase substantially, the number of seedlings required may decrease, and the success rate of plantings should improve markedly. The shelters should also decrease the need for site preparation or seedling release. I have no experience with the tubes at this time, but am looking forward to working with them.

Conclusion: As some of us begin working with intensive reforestation of intolerant hardwood species, it is necessary that we have good stock to work with. The regeneration of these forests is one of the most challenging and necessary tasks facing us today. It requires the combination of educated landowners, enthusiastic foresters, crews of technicians, adequate funding and good seedling stock. I can get the rest together, but I must count on you to provide the seedlings that I need.

Field foresters and nursery foresters are commensal organisms. Neither can do the job without the other. It is important that we talk to each other regularly and cooperate, to make the planting season a success.

It is my expectation that hardwood planting will become a more important item in the diet of many foresters. You may be called upon to provide more, and better hardwood stock in the near future.