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THIN FOR QUALITY AND HEALTH, NOT SPACING

Southern Oregon Forest Resources Note #18

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Your chainsaw is revved up and you're about to sink the bar into a nearby Douglas-fir sapling. But which one? You're surrounded by hundreds of them, some smaller, some larger, all pretty close together, but not uniformly spaced. There are some madrone trees too, and cedar, and a few spindly pine. You heard somewhere that trees should be ten feet apart …..twelve feet ….or was it fifteen feet? You can't quite remember. What to do?

Many landowners ask about proper or optimum spacing when thinning trees. I'd suggest not getting too hung up initially on spacing, but instead focus on tree quality and health (vigor). If you leave primarily high quality trees and take out mostly low quality trees, it's hard to go wrong. You're likely to have a healthier, more vigorous, more fire-resistant, and more valuable stand in the long run.

Is spacing between trees unimportant? Not at all. Trees need adequate growing space to thrive. However, rigidly adhering to exact spacing (e.g., 14' x 14') may lead you to cut trees that should be left and to leave trees that should be cut. This is especially true in natural stands where spacing between trees is highly variable. In plantations where spacing between more regular, using pre-determined spacing or stand density rules makes more sense. Remember, that spacing guidlelines are just that, they guidelines and as such should remain flexible for leaving the best tree. Also, remember that as trees grow bigger, they progressively need more space, so space trees out wide enough so that they will grow well until the next thinning, which hopefully will be commercial

So what makes a high quality tree? Following are some guidelines for "leave" and "cut" trees that relate to tree quality. These are all characteristics you can "eyeball" out in the woods.

Characteristics of "leave" trees:

- Good live crown ratio (30% or greater)
- Good height growth for species and age
- A-shaped crown ("pointy top")
- Abundant foliage with good color
- Good form (straight, without sweeps, crooks, forks, etc.)
- Species is well suited to the site over the long term

Characteristics of "cut trees"

- Poor crown ratio (<30%)
- Poor height growth and crown form (flat or rounded top, lopsided)
- Foliage is sparse or off-color
- Poor form or has signs of damage or internal decay
- Species not well suited to the site

Crown ratio

Crown ratio is the percentage of the total height of the tree that is occupied by the live green crown. For example, a tree that is 75 ft tall and has crown on the upper 25 feet of the tree has a live crown ratio of 1/3 or 33%. Crown ratio is important because the bigger the crown (the tree's "food factory"), the better the tree's growth. The rate of tree growth slows down in most species when the live crown ratio drops below 40%. Trees with crown ratios of 30% and greater often respond well to release (removal of surrounding competing trees), while trees with crown ratios below 30% often respond poorly. These trees may experience thinning shock or sunscald, or grow very slowly. Trees with very small crown ratios may simply die after thinning. This often happens after diameter limit thinning (removal of all trees above a certain diameter limit) or high grading. Gradual, light thinnings are recommended for very dense stands where few if any leave trees have desirable crown ratios.

Height growth

Height growth can be determined by examining the length of the leader, if visible, or, on many conifer species (including the true firs, pines, Douglas-fir), the length of internodes, which is the distance between branch layers or whorls. Trees with good height growth are preferred as leave trees.

Crown shape/form

Pointy-topped or A-shaped crowns indicate rapid height growth. Rounded tops mean height growth has slowed. Good height growth is a sign of good vigor. However, as trees age, height growth slows, and the tree tends to develop a round or flat top. Full, symmetrical crowns are preferred over ragged or lopsided crowns. Lopsided crowns develop when a tree is crowded on one or more sides. Trees with lopsided crowns are more vulnerable to blowdown and breakage in snow and ice storms.

Crown color/needle density

A dark green color indicates good vigor. Light green or greenish yellow foliage ("chlorotic foliage") is a sign of stress. This may be due to nitrogen deficiency, root disease, bark beetle attacks, or simply moisture stress.

Crown sparseness

A sparse or thinning crown, resulting from needle loss and is another sign of stress. This can often be best determined by comparing a thin or sparse crown with a denser crown on a nearby tree. An abundant crop of undersized cones ("distress crop") is sometimes an indication that the tree is severely stressed and likely to die in the near future.

Stem form

The form of the tree trunk (stem) is an important consideration in thinning. All other things being equal, trees with straight trunks and little taper are most desirable as leave trees from a timber perspective. However, trees that are very tall for their diameter tend to be unstable and easily bent by the wind or snow, so some taper is important. Undesirable stem features include cat faces, sweep, pistol butts, crooks, and forked tops or other defects. Defective trees may also make good wildlife trees, so having a few around is a good thing if your interested in wildlife.

From a log value standpoint, trees that have large limbs (sometimes from being open-grown), many limbs, and sharp-angled branches are less desirable as leave trees than trees with fewer and smaller branches.

Other considerations

These guidelines touch on a few key indicators of tree quality. You should also be on the lookout for evidence of insect and disease problems, some of which may warrant tree removal, regardless of other factors. Tree species should also be considered. You may want to favor or discriminate against one or another species in the stand based on its shade, drought, or frost tolerance, marketability, suitability for wildlife, or other considerations as well as if the species will grow well on the site.

In a nutshell, these guidelines follow the old adage, "cut the sick, lame, and lazy, and leave the better ones." As you thin for quality, you will probably also be reducing stand density to more desirable levels. It may not be too scientific, but forestry, afterall, is a science *and* an art.