United States Department of Agriculture

Forest Service

Northern California Shared Service Area

2400 Washington Ave.
Redding, CA 96001
530-242-2336

File Code: 3400 **Date:** February 7, 2001
Route To:
Subject: Borax Recommendations for Goosenest RD (FPM Rept. No. 01-03)
To: Roger Siemers, District Silviculturist

Roger Siemers asked for written recommendations for the use of borax to prevent infection by *Heterobasidion annosum*. The District has been doing a lot of mechanical thinning in small diameter ponderosa pine and white fir. Because there are a large number of stumps produced, it would significantly affect the economics of each sale if it was not necessary to treat the smaller stumps.

The basic question is: What would be the smallest stump diameter which needs to be treated? The same question has already been addressed on the Lassen NF using data derived on the McCloud RD, Shasta-Trinity NF, and also from the Modoc NF. These areas are adjacent to the Goosenest RD, and there is every reason to believe that they are adequate.

The 3420 Evaluation to the Lassen NF dated February 28, 1995 is attached. Figure 2 represents four harvested eastside pine stands on the McCloud RD. It shows virtually no infection of 14 inch diameter pine stumps, and less than 5% infection of 18 inch diameter pine stumps. Table 3 represents 10 non-boraxed timber sales areas on the Modoc NF. It shows no infection in either the under-12 inch diameter, or the 14-to-18 inch diameter classes of stumps, although the sample size is small.

Based on the available research, as well as a lot of field observations, a conservative recommendation would be to use borax on stumps with a diameter of 12 inches, or greater. From a practical standpoint, some applicators have found it easier to comply with this requirement if the stumps are cut several (approximately 4) inches above the ground. By placing the cut above the butt swell, it will reduce the number of stumps that need treatment. Leaving slightly higher stumps will also make it easier to find the stumps that need treatment in a mechanically harvested area. The stump height suggestion is not an absolute requirement if this conflicts with other resource objectives, or if there are more satisfactory ways to assure treatment compliance.

/s/

Dave Schultz
Entomologist

attachments

Table 3-- Ponderosa pine stumps with conks of Heterobasidion annosum, by diameter class, on ten non-boraxed timber sale areas on the Modoc National Forest

Diameter	Stumps		
	Total observed	With conks	Infected
Inches	No.	No.	Pct
12 or less	20	0	0
14 to 18	7	0	0
18 to 22	12	2	17
22 to 26	29	10	35
26 to 30	73	30	41
30 to 34	88	45	51
34 to 38	86	52	60
38 to 42	62	42	68
42 or more	45	33	73

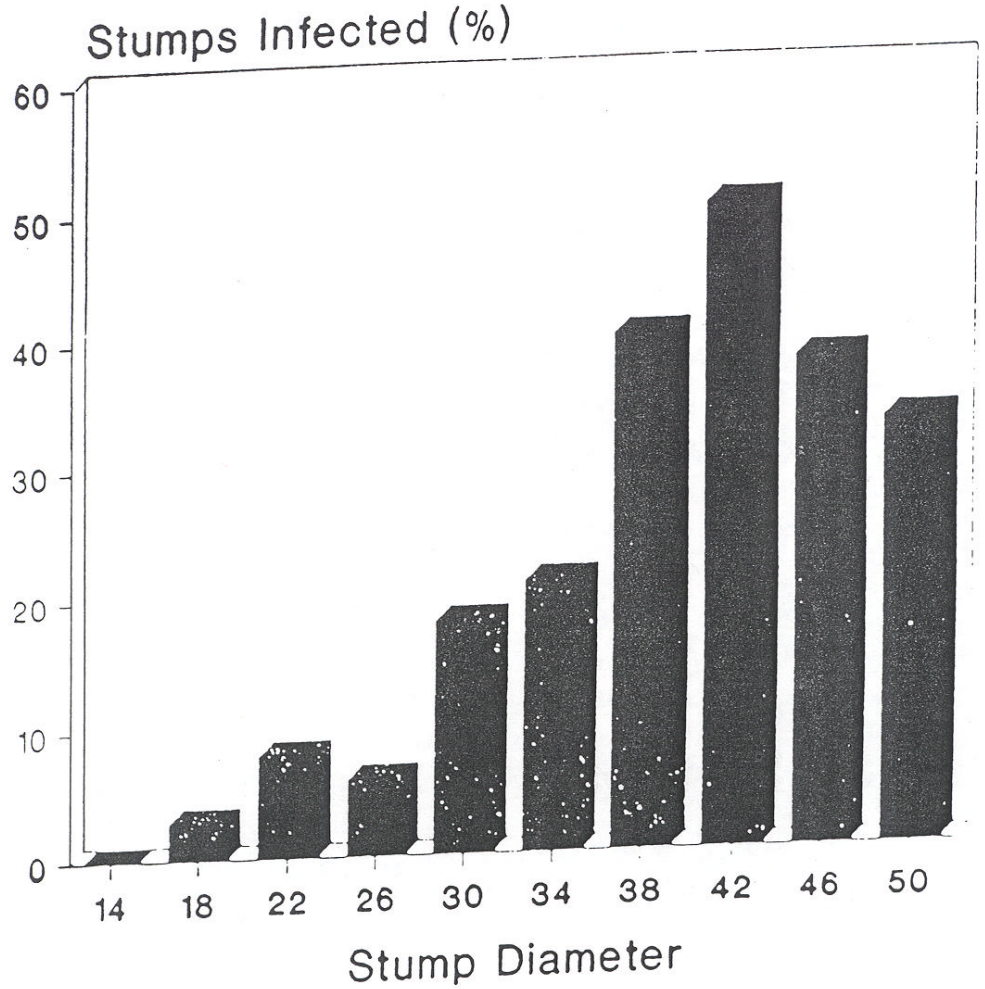

Figure 2. Percent of pine stumps infected by Heterobasidion annosum by diameter class.

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File Code: 3420
Route to: 2430

Date: February 28, 1995

Subject: Annosus risk in eastside pine

To: Tom Simonson

At your request, the following tables and figures are provided to aid in determining risk of infecting eastside conifer stands with annosus root disease. Table 1, prepared by John Kliejunas, shows the relative susceptibility of conifer stumps to the fungus, Heterobasidion annosum. Figure 2 and Table 3 (from the 1989 USDA General Technical Report PSW-116), summarizes field data relating pine stump diameter and annosus infections. Figure 2 represents four harvested eastside pine stands on the McCloud RD, Shasta Trinity NF. Table 3 represents harvested stands on the Modoc (Note: the small sample size for the 14-18" stumps).

I hope this helps.

Bill Woodruff

WILLIAM C. WOODRUFF
Plant pathologist

Table 1. Relative susceptibility of conifer stumps to Heterobasidion annosum/risk of disease center initiation.

Factor, in order of importance	Degree of Susceptibility/Disease Center Initiation		
	High	Moderate	Low
Tissue	live	recently dead	6 months+
Species	PP/JP & Juniper	true fir	other conifer
Stump Diameter	14"+	8" - 14"	less 8"
Type of Harvest	partial cut	patch cut	clear cut
Season of Harvest	Spring	Fall/Winter	Mid-summer