

The people of Bovill are gradually finding out what the chemical crew is doing. When we first landed in the vicinity they heard something of the white pine blister rust and of how the disease spread. From this they got the idea that we spent the day looking for the particular bug or insect that caused the damage. Therefore, gave us the name of "bug-chasers". But after a few days, when they visited the East Fork of the Potlatch River, they found that the vegetation on certain strips was almost completely killed. In this way they got a better idea of our work and next year on visiting these same strips they will find the Ribes nearly a minus quantity. (Chemical Eradication)

One of the old timers on seeing a string line thought a city fisherman had been up for the week end and, in order to keep from getting lost, had laid the string to follow back. (Chemical Eradication)

GROWTH AND YIELD STUDIES OF WESTERN WHITE PINE
IN RELATION TO BLISTER RUST CONTROL

by

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Perhaps the most important need for further yield study, from the standpoint of blister rust control, deals with the ratio of western white pine to other species in the much mixed stands of this forest type. The point which makes the matter especially urgent to know about is that the proportion of species changes as the stand develops from youth to maturity. The need is to know, for example, if a stand which contains 15 per cent white pine at 20 years of age will have a greater or less percentage of that species at 80, 90, or 100 years. It is necessary to have the answer to this question in order to know whether eradication of Ribes will be financially profitable in young stands containing low proportions of white pine.

The common condition in the western white pine type is a mixture of a half-dozen or more species, including white pine, larch, Douglas fir, white fir, Engelmann spruce, hemlock, and cedar. In these stands white pine has a high stumpage value and the other species have little or no value at present. If the ultimate cost of eradication--and several eradications may be necessary in the life of the young stand--will be greater than the stumpage value at maturity of the white pine to be saved, then it would be a mistake to eradicate. Factors which influence the problem in addition to the changing ratio of species are site quality and density of the stands. Naturally the yield to be expected at any given age varies according to whether the site is good, fair, or poor. Yield also varies through a wide range from fully stocked to very open stands.

In order to show the relationship of all this to Ribes eradication, the cost of eradication in several hypothetical stands is here carried forward from youth to maturity. The figures given are based on existing

normal yield tables for three qualities of site, assuming fully stocked stands except as indicated. Four conditions of composition are assumed; 20, 40, 60, and 80 per cent white pine with the remainder of mixed species which have not been differentiated. The standard formula for calculating profits in forestry was used with such modification as was necessary. The rotation used was 100 years and a single eradication was assumed to be done at 20 years of age. An interest rate of 3 per cent was chosen to correspond with that used in damage appraisal calculations of the U. S. Forest Service in Idaho and Montana. Two sets of stumpage prices were used, present and future. The following present prices were taken: \$9.00 a M for white pine and -\$6.00 (minus) for the secondary species. For future prices the following: \$20.00 for white pine and \$1.50 for the secondary species. Present tax rates of 10 cents per acre were used up to 80 years, and 6 cents a M for white pine and 1½ cents a M for secondary species were used for the timber after it reached merchantable size. Cost of protection was placed at 10 cents an acre. Cost of eradication was taken from Western White Pine Blister Rust Proceedings for 1925 at \$2.22 an acre for dense reproduction, \$5.64 for open reproduction, \$0.50 for dense mature timber and \$2.57 for open mature timber. Using these data, the calculations give the following tabulated results:

Net Profit per Acre at 100 Years

| A. Present Stumpage Prices Used | | | |
|---------------------------------|-----------|----------|----------|
| Per cent of white pine in stand | Site I | Site II | Site III |
| 80 | \$ 194.84 | \$115.36 | \$ 39.10 |
| 60 | 32.63 | -2.68 | -34.76 |
| 40 | -129.58 | -120.71 | -108.62 |
| 20 | -291.79 | -238.75 | -182.48 |

| B. Future Stumpage Prices Used | | | |
|---------------------------------|----------|----------|-----------|
| Per cent of white pine in stand | Site I | Site II | Site III |
| 80 | \$793.27 | \$551.05 | \$ 312.05 |
| 60 | 590.39 | 403.40 | 219.64 |
| 40 | 387.51 | 255.76 | 127.23 |
| 20 | 184.63 | 108.12 | 34.82 |

The variation in profits is due, of course, to changes in percentage of white pine. The eradication costs and carrying charge are exactly the same in all cases. Under these conditions, using present stumpage prices, it would apparently pay to eradicate Ribes only in case the percentage of white pine present is 56 per cent or over on Site I, 63 per cent on Site II and 69 per cent on Site III. In using the future stumpage prices here assumed, eradication would pay regardless of composition, though the margin of profit would be greatly cut down in the case of low percentages of white pine.

As understocked stands will also have to be dealt with in the work, an example of that is here given in which the stocking is 50 per cent of

normal. Figures for Site II only are given. In this case it would pay to eradicate only if the stands contain 27 per cent or more of white pine.

Net Profit per Acre at 100 Years

Using Future Stumpage Prices

Stand 50% Stocked

| Percentage of white pine | Site II |
|--------------------------|----------|
| 80 | \$195.18 |
| 60 | 121.35 |
| 40 | 47.53 |
| 20 | -26.30 |

There are several matters to be pointed out in connection with the above calculations. One is that the figures show the importance of determining the percentage of white pine in the stand before eradication and also the importance of knowing whether the percentage of this species will increase or decrease as the stand advances in age. What such changes are are not known and no assumptions can therefore be made in this connection. This specifically is the point at which further study is needed.

A point that needs comment in the above calculations is that the carrying costs (taxes and protection) amount to a huge figure by the end of the rotation as compared with the cost of eradication compounded to that time. The eradication costs here used have an end value of \$5.32 for the less expensive eradication and \$60.02 for the most expensive, whereas the end value of taxes and protection amount to \$112.63. Considering the figures as given, the natural conclusion would be that the growing of timber as a private enterprise is not profitable under present conditions except on the best sites, and then only in stands containing a high proportion of white pine. The situation is not as hopeless as this, however, for the reason that any private concern which owns enough timber to stay permanently in business, i. e., to grow each year as much timber as it cuts, would logically not be justified in carrying forward the protection and taxes in this way, but would naturally charge them off currently as a part of the cost of running the business. In doing this it would easily be profitable to eradicate Ribes several times in the life of the stand if necessary. In the case of state and federal owned timber, of course, there are no taxes and the cost of protection is not carried forward as a charge against the final crop.

Another need is to determine the influence, if any, of various compositions of species in the stand upon the total yield per acre. Does a stand with 30 per cent white pine and 70 per cent white fir, hemlock, and cedar have a greater total yield than one in which the ratio, for example, is 70 per cent white pine and 30 per cent other species? There are the combinations of white pine with intolerant associates such as larch and Douglas fir, then there are the combinations of white pine with

more tolerant associates like cedar and hemlock. The Experiment Station already has field data on this problem which, when it is compiled will throw light on this problem. Another need is to know what is the best stocking to produce saw timber. This will be somewhat less than the full, or what we call normal stocking, which produces the maximum cubic volume for a given site and age.

Classification of forest land into good, fair, and poor sites will naturally be necessary in order to state which areas have high productive capacity for white pine to make eradication feasible. Although site classification has not been undertaken on an extensive scale on the National Forests, forest research has developed accepted methods for site classification and this can therefore be carried out in connection with Ribes eradication. Research methods are far enough developed along this line to make this practicable.

"ASK ME ANOTHER"

H. R. Offord (Chemical Eradication)

In the course of our field work we often encounter curious people whose vague nebulous idea concerning our work calls forth all of our latent histrionic talents when they pop their questions. The idea most prevalent amongst the hoi polloi is essentially "the bug theory". You are doubtless familiar with it in one of its many forms. As might be expected, chemical eradication readily lends itself to the barbs of the curious and the other day I had hurled at me the deadliest one of them all.

I was forced to pull up behind a "cut" and "grader" along the narrow road into our camp at Bovill, and while working around to pass them I was accosted in this wise by the bewhiskered individual on the grader:

"Say! are you doing this blister work up the creek here?"

"Yes," said I.

"Well, say! Tell me, what do you do with all those strings through the brush." (He had reference to our string lines marking the boundaries of strips.) "I figured out and explained to my partner here that you put some sort of bait on all those lines and then used them to catch the bugs with."

Anxious friends may be relieved to know that the writer is now resting quite easily.

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A good many of you readers have heard of persons, both he's and she's being "under the table" in regard to a few drinks he or she may have partaken of, but how many have heard about a man who was so hoggish at the table that he just naturally slipped under. You haven't heard? Ask Roy Hall. (Camp 2 - Idaho)