THE BLISTER RUST SITUATION IN THE WEST

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Introduction

It has been often and truthfully stated that the small things in life give us the greatest concern and certain scientists have gone so far as to state that the human race will be conquered in the end by tiny organisms such as bacteria and insects. We are confronted daily with examples of this unrelenting strife between man and the "microns". In our efforts to grow crops of every description we are forced to wage war upon a host of pests and in our struggles to perpetuate our forest crop so that we may remain a nation of wood users we are faced with problems, the magnitude and intricacy of which would do credit to the fertile brain of the forester's patron saint, Paul Bunyon.

The fight to hold what we have in white pine timber against a tiny but destructive organism, the white pine blister rust, began soon after the discovery of the disease in 1910 at Vancouver, B. C. During the past eighteen years the disease has spread until today its southern limit is northern Oregon where it threatens the sugar pine stands of Oregon and California. It is well established in northwestern Washington and has flung a battle line eastward across British Columbia, northeast Washington and has finally penetrated the panhandle of Idaho. That the spread in a northerly direction has been more extensive than in a southerly direction may give us some comfort. But when we consider that the rust has been found to make a jump of 150 miles from infected pine to currant bush we begin to realize that under certain favorable conditions the disease may lead us a merry chase. The spread from currant or gooseberry bush back to pine is limited, however, and may vary from 900 feet to a mile depending upon the kind of currant and gooseberry.

As in any battle line pushed into our territory we begin to look for the weak points of attack and we find in this case that removal of the currant and gooseberry plants snaps the backbone of the rust attack by breaking the cycle necessary for the complete development of this organism. If you will recall how malaria fever was swept out of the Panama Zone by the systematic and, at first, hopeless task of eliminating the carrier mosquito you will find an apt parallel in our present difficulties. We might liken the spread and intensification of this disease in the white pine areas to the invasion, intrenching, reinforcing and the advance of an army leaving destruction in its wake. From a few small infections on currant bushes the disease obtains a foothold on neighboring white pines. Its development in the pines is slow at first until the disease reaches the stage where spores are produced that are capable of infecting new bushes far and near. These areas thus become new centers of infection and the disease spreads and intensifies. The coast of British Columbia has just reached the damage stage and the new infections in Idaho represent the invasion stage, between these two extremes are many gradations.

Investigative Work

The Office of Blister Rust Control located at Spokane, Washington has been steadily working on this problem and along with cooperating Federal and state agencies has been active in gathering data on the fungus and its hosts; devising and testing methods of control and improving control measures as well as reducing the control costs per acre. These data are gradually pointing the way to practical control measures in the face of a complexity of factors which makes blister rust one of the most difficult problems foresters and lumbermen have been forced to face. The forests of the western timbered regions are teeming with several species of wild currant and gooseberry, and along the stream beds solid masses of these plants flank valuable and extensive white pine forests. Fortunately not all of these alternate hosts, as they are called, are as effective in developing and spreading the disease as is the cultivated black currant which is being rapidly eliminated from the white pine regions. The wild currant and gooseberry plants differ greatly in this respect and this fact has called for a series of painstaking experiments on the part of the Federal workers to determine the relative power of these different plants to develop and spread the disease.

Classification of Control Areas

So far I have given you but a charcoal drawing of the picture but I hasten to assure you that from the timber owner's point of view there are several bright spots to be added. Based upon the information so far accumulated we have every reason to believe that much may be accomplished by the adoption of methods of forest management which discourage the development and eventually eliminate the wild currants and gooseberries from the threatened stands. We find that in dense mature stands the currant and gooseberry bushes are lacking or are so few in number that they can be disregarded. We also find that certain logged or heavily burned areas are also free of these bushes. Data obtained by the Spokane Office indicate that there are large areas of timber from pole size on up containing but few bushes of a species so low in susceptibility that they can be disregarded as far as their damaging power to the timber is concerned.

Since fire in general and logging operations or other disturbances of the forest floor increases the blister rust hazard by reestablishing in large numbers the currant and gooseberry plants on the burned areas where white pine reproduction is developing, we have here an additional argument if any is needed, for keeping fire out of the white pine timber. A closed stand and a minimum disturbance of the forest floor reduces the fire hazard and prevents the development of large numbers of Ribes bushes. In the white pine region of Idaho these facts point to a method of logging that favors residual stands, a minimum duff disturbance and a better protection against fire. That these requirements favoring blister rust control go hand in hand with better forestry practice give us a measure of encouragement.

These data apply more closely to the conditions existing in the white pine type of Idaho. The sugar pine stands of California, on the other hand, offer problems differing widely from those found in Idaho. In the sugar pine stands, fire does not occupy the same relative position of importance as it does

in the Forests of Idaho. The correlation of forest management and blister rust control in California must therefore follow somewhat different leads. With this in view special studies are to be started in the California region in 1928.

Control Plan

In reviewing the principal elements of a general plant of control it is obvious, at the outset, that the entire forested area bearing susceptible pines can not be included within the control area. The job would be too huge and too costly, and we would be spending money protecting large units of forested land upon which the total present or future value of the white pines would be so small that the expenditure of control money would not be justified. The choice of areas needing protection, therefore, must be made (1) from areas including commercial stands, and (2) from areas including reproduction stands. All other areas may be excluded. To begin with, this reduces the burden of control appreciably. There are other factors that will aid us in paring this acreage under control down to a less formidable figure. (Heavy burns, double and triple burns at right intervals, dense stands, etc.) It has been roughly estimated that from 60 to 85% of the mature stands in Idaho are practically Ribes free.

The selection of acreage to be placed under control is complicated, however, and the need for control is most pronounced in regions where forest density is great, but where the streams within the drainage support a large number of highly susceptible bushes. Fortunately, the Spokane Office has developed a chemical spray which is proving to be an effective weapon of control on such areas. Since reproduction areas are possibly the ones needing first attention it is well to consider the increasing acreage coming into reproduction each year through the agencies of fire, logging operations, insect and fungus attack and windfall.

The control problem is not so much concerned with the removal of small numbers of Ribes plants of low susceptibility scattered through the timber stand but with the high concentrations of such species and also of the very susceptible species.

It is an established fact that young pines are killed by blister rust within a short time after infection. A much longer period is required to bring about the death of larger and older timber. It is estimated that it might require as long as 30 years to kill some of the larger trees. Within this limit the actual period of damage to pines in any particular locality may be shorter or longer than this depending upon the severity of local infection. No general rule regarding the rate and severity of damage to mature white pines can be laid down with our present knowledge of the problem. It would seem, however, that the method of forest management adopted by the owner of the timberland would be a determining factor in his decision to apply control measures. An owner who is cutting everything merchantable with no intention of returning for a second crop and who has but a ten year cut of mature timber ahead of him can not be expected to invest money in blister rust control. That he will have to suffer some loss is inevitable, the extent of damage depending upon

a number of factors. On the other hand an area representing several year's cut and where continuous production of white pine timber is the goal can not be neglected - control measures must be applied if the white pine is to be grown permanently.

Local control, which is based upon the inability of the rust to spread from Ribes to pine for more than a relatively short distance, was developed in the eastern part of the United States. It has been in use there sufficiently long to justify its adoption. In the eastern states over 800,000 acres are annually being placed under protection by this method and, during the past ten years more than six million acres of white pine land have been cleared of Ribes. The method consists of the removal by pulling or by the use of chemical sprays of the Ribes growing within 900 feet of pine stands. In more open pine stands a second removal is necessary in the sixth or seventh year following the first. Where the stands are dense the first removal of Ribes suffices for a much longer period and in many cases needs no further eradication until fire and logging change the nature of the stand and cause the return of the currants and gooseberries.

The plan of applying this method in the Inland Empire region as outlined by the Spokane Office of Blister Rust Control includes the following steps:

1. Ribes eradication and re-eradication in the stream type before heavy damage results.
2. Ribes eradication in those reproduction stands which will suffer damage before Ribes are naturally eliminated by dense forest growth.
3. Ribes eradication in maturing stands that are in danger of serious damage.

It is believed that the stream type represents our greatest rust hazard in Idaho and therefore needs our immediate attention. That sugar pine regions, differing greatly from the north Idaho areas, can not be handled under such a plan is obvious and methods of attack to meet the local conditions must be developed.

As I see it, the problem of control is of such a magnitude and involves such a complexity of factors that nothing but a uniform control plan applied to the entire white pine area as a unit can ever bring about the measure of control that is essential for protection. As a part of such a plan, there is every reason to believe that proper methods of forest management will play an important part in the successful control of white pine blister rust.

None are more familiar with the difficulties to be encountered in protecting white pine from such a disease than the Federal agencies in the field. They are, however, making excellent progress with an extremely difficult problem and they deserve your hearty support and cooperation.

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