

Excerpted from:

2015 Season Report
Continuous Screening Project in Wild Blueberry

Foliar Diseases

Lilly of the Valley

3-toothed cinquefoil

Lamb's quarters

By

Mireille Bellemare, *M.Sc.* Biology



Results

The symptoms of leaf diseases (septoria and rust) appeared late in 2015 in experimental plots. The percentage of leaf spots, all treatments combined, was less than 10% as of July 15, 2015. When the following data was collected, on August 11, this had climbed to almost 30%. Appendix 1 presents all the results. The most interesting are shown below.

Rust and septoria spots are sometimes difficult to distinguish because the orange spots characteristic of rust are found on the underside of the leaf and are not always visible depending on the stage of disease development (figure 2). After the collection of samples, they were grouped together as leaf diseases for purposes of analysis.



Figure 2: Close-up on leaves with leaf diseases (rust and septoria), 2 weeks after the last application (August 11, 2015)

Figure 1 (not shown in this excerpt) shows that, two weeks after the last application (2 SAT), Proline is the most effective product with a percentage of leaf diseases of 1.5%. This is not surprising - its effectiveness has already been proven. Actinovate (425 g) is the biofungicide that performed best, it led to a percentage of leaf diseases of nearly 25%. It should be considered for future trials.

The other products are not significantly different from the control that approaches 45% of leaf diseases. Copper-based products (at a rate of 2 kg/ha) have not been shown to be effective against blueberry diseases. This response is similar to that obtained in the study by the Technical Institute of Organic Agriculture (France) in grapes, fruits and vegetables where the maximum recommended annual quantity of copper (4kg/ha/year) does not currently give adequate protection to organic crops against pathogenic fungi and bacteria during years of high disease pressure. During the September 9 follow-up, (6 SAT), the only notable difference is that the oxychloride 2000 g + hydrated lime 2000 g, stands out from Proline, ranking second in its effectiveness (Appendix 1).

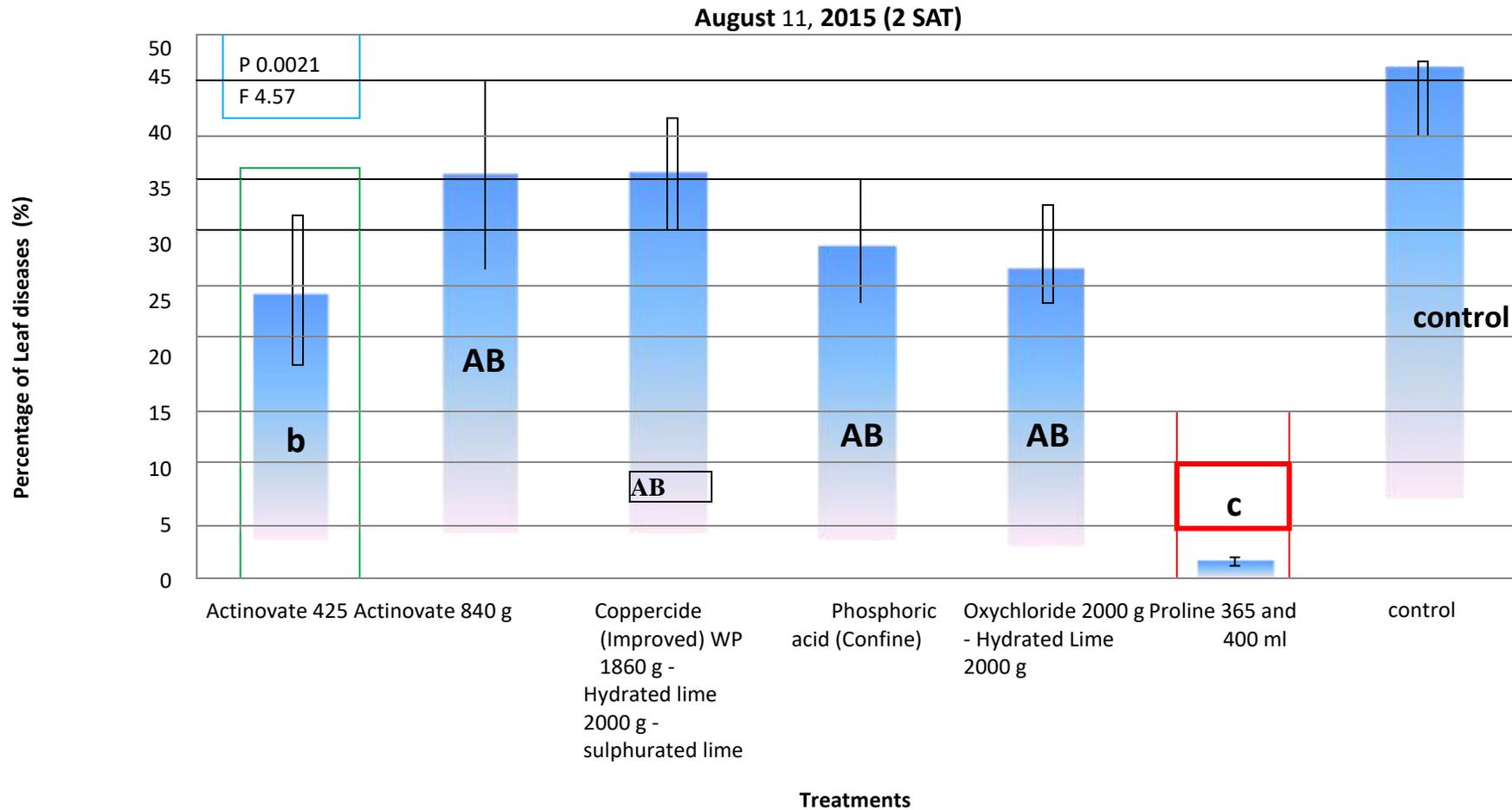


Chart 1: Percentage of leaf diseases (rust and septoria) for each treatment, 2 weeks after the last application (mean standard error +- ANOVA (analysis of variance) complete blocks and multiple comparisons LSD (least significant difference)).

An assessment of plant defoliation was conducted in the fall of 2015 (graphic 2). The healthiest plants tend to keep their leaves longer. Proline is the treatment with the lowest percentage of defoliation (7%). Copper treatments (Coppercide and Oxychloride) follow Proline with about 25% defoliation and then the control is dead last with nearly 50% defoliation. A similar observation was made in an earlier study conducted on Prince Edward Island (Percival, 2008), where the leaf retention of Proline-treated plants was 99% while that of control plants was 64%.

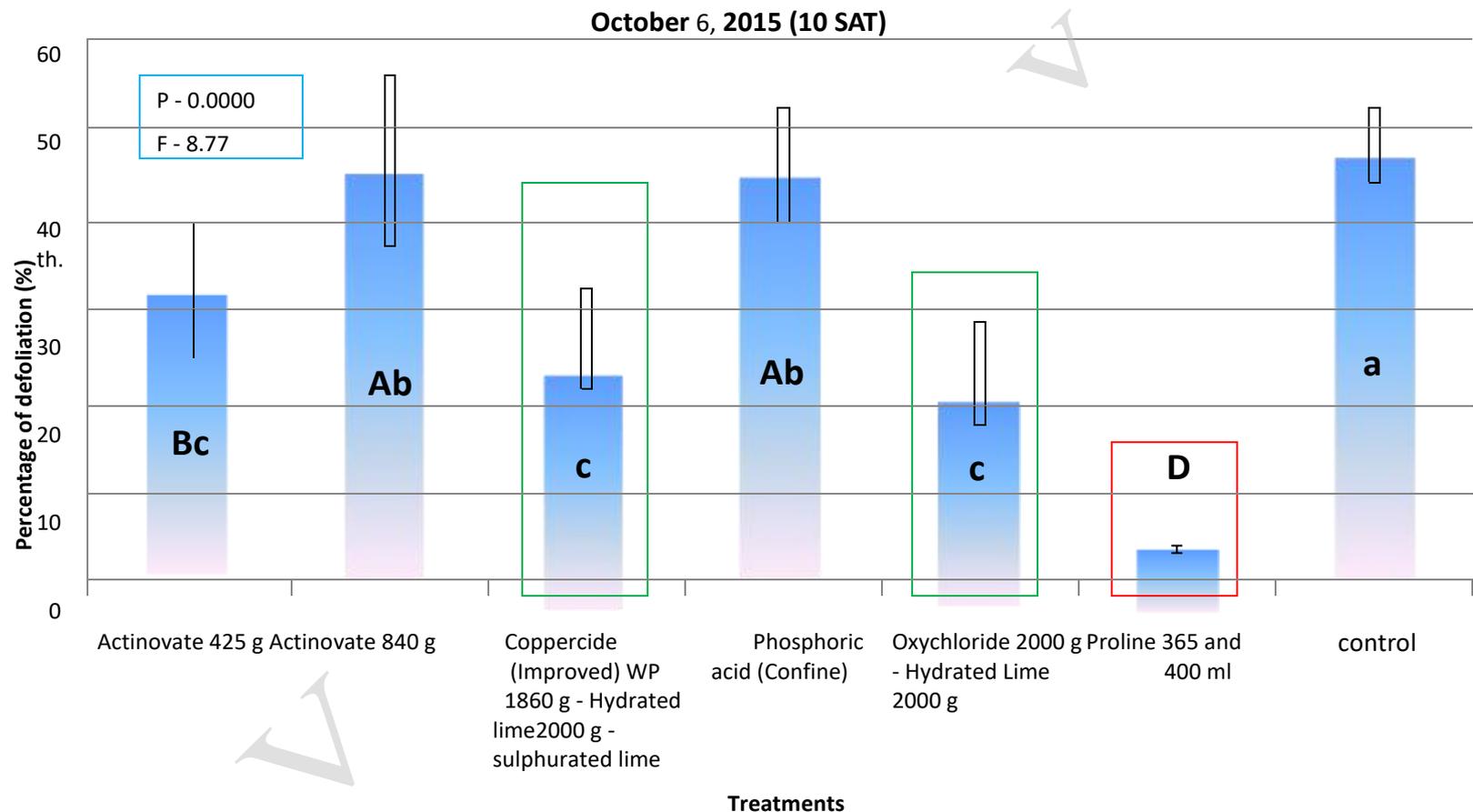


Chart 2: Percentage defoliation of plants for each treatment, 10 weeks after the last application (mean standard error +- ANOVA in complete blocks and multiple L SD comparisons)

The percentages of stems with branches and stems with black thread were recorded in 2015. However, statistical analysis did not distinguish significant differences between treatments for these two variables (Appendix 1).

Conclusion

Here are the **findings** for the biofungicide tests of 2015.

Diseases (2SAT): The results indicate that **Proline** (conventional) is the **most effective** treatment with 1.5% leaf diseases (rust and septoria), **followed by Actinovate 425 g** with nearly 25%. Control plants have a leaf disease rate of about 45%.

Treatment	Efficiency	
Actinovate 425 g	+?	25%
Actinovate 840 g	-	
Coppercide – hydrated lime – sulphurated lime	-	
Oxychloride – hydrated lime	+ ?	
Proline	++	1.5%

Control:
45%

Although **copper treatments** (Coppercide and Oxychloride) stood out for the defoliation percentage variable, there is **no evidence that this is completely related to disease reduction**. Copper is a nutrient that activates certain plant enzymes. It plays a role in photosynthesis and the metabolism of some sugars and proteins.

In short, organic treatments have not met the expected results in the protection of blueberry plants because the percentage of diseases observed in these treatments is significantly higher than that obtained with Proline.

Next year, fruit buds, flowers and yield will be measured.

The control of leaf diseases is important to blueberry growers because yields can be reduced as soon as the percentage of septoria spot reaches 1% (Percival, 2014). Yield reductions of around 20% have been reported several times in rust-affected fields (Percival, 2014).

The results of this project in 2016 will show whether organic treatments lead to **higher yields** and whether they are economically viable.

Reference

Technical Institute of Organic Agriculture, 2009. Use of copper for the organic production of wine, fruits and vegetables. Available at <http://www.itab.asso.fr/downloads/viti/rapport-final-cu-viti09.pdf>]

Percival, D. 2008. Leaf Disease Complex Suppression in Wild Blueberry Production. Power Point presentation. 2008 WBANA/WBREW. Moncton, NewBrunswick.

Percival, D. 2014. Sprout Year Leaf Disease Management In Wild Blueberry Production. Power Point presentation. Annual meeting Scotia's wild blueberry growers(WBPANS).

Version de travail