

## **Western Regional IPM Grants Research/Extension Accomplishments Report**

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**CONTACT:** Oregon State University

**PROJECT NUMBER:** ORE00296

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**PROJECT TITLE:** Reduced Fungicide Use for Hop Downy Mildew Management

**PRINCIPAL INVESTIGATOR:** Ocamb, C. M.

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**CO-PIs or TEAM MEMBERS:** Gent, D.H.

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### **THE PROBLEM, ISSUE, OR REASON FOR CONDUCTING THE**

**RESEARCH/EXTENSION:** The overall goal of this research and extension project is to improve hop grower profitability and sustainability with reduced-risk pest management tactics. Hop downy mildew is one of the most economically important diseases of hops grown in the US, and management relies largely on prophylactic fungicide applications. Disease forecast models can aid growers in improved use of pesticides. Two growing degree-day models (based upon air and soil temperature) that predict the first emergence of hop shoots systemically infected with the downy mildew pathogen (i.e., primary basal spikes) were evaluated in small plots and commercial yards of cooperating growers. These models may predict when fungicide applications should begin to protect plants from the early season spread of spores from primary basal spikes. A downy mildew forecast model developed in England was also validated in small plots. The model predicts the severity of infection events in response to weather (rainfall and hours of relative humidity about 90% in the previous 48 hr period). When an infection period is predicted to have occurred, a fungicide application is recommended to limit secondary spread of disease.

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### **THE SINGLE MOST IMPORTANT ACCOMPLISHMENT OR BENEFIT RESULTING**

**FROM THIS RESEARCH/EXTENSION:** Fungicide applications applied according to the downy mildew risk index provided disease suppression similar to that of the standard grower spray program, but with four or five fewer applications.

**ADDITIONAL BENEFITS:** Research thus far has shown that at least three, perhaps four to five, fungicide sprays can be eliminated by use of the growing-degree day and infection risk model, without reducing control of the disease. If 50 % of the U.S. hop acreage is managed with the aid of this disease forecasting system, 15,000 pounds of fungicide would not be applied annually (assuming that three sprays were eliminated) and would save producers an estimated \$900,000 annually in pesticide and application costs; helping grower profitability as well as reducing pesticide use and associated environmental impacts.

**THIS FORM WAS COMPLETED BY:** Cynthia M. Ocamb, Associate Professor