

NEW STRATEGY FOR THE USE OF *AMPELOMYCES* SPP. AGAINST GRAPEVINE POWDERY MILDEW: SANITATION AND DISEASE MODELLING

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Powdery mildew, caused by *Erysiphe necator* (Schw.) Burr., is one of the most widespread and economically important diseases of grapevine. It is a polycyclic disease, with primary, sexual infection cycles followed by several secondary, asexual cycles. The primary inoculum consists of ascospores produced in chasmothecia overwintered on the bark of vines, or of conidia produced by the mycelium present in dormant buds. Nonetheless, in many grape-growing areas, flag shoots (i.e. shoots generated by the infected, dormant buds) are usually absent in commercial vineyards. Chasmothecia form in late summer on the affected host tissue and, once mature, are dispersed by rain splashes to the bark of vines. In the following spring they repeatedly release ascospores that trigger new infection. The usual approach to powdery mildew control consists of repeated applications of fungicides from budburst to berries pea-size, and more; sanitation, i.e. the process that reduces or eliminates the initial inoculum from which the disease epidemic starts, would be highly effective in early-season control of powdery mildew. Efficacy of sanitation has been already evaluated in Northern Italy; interestingly, the application of a BioControl Agent based on *Ampelomyces quisqualis* Ces. (the biofungicide AQ10® WG) gave good results, comparable with those obtained with fungicides. This biofungicide applied twice, before and after harvest (i.e., during the formation and maturation of the chasmothecia) halved disease severity on bunches until the pea-sized berries stage in the following season. When sanitation with *A. quisqualis* was coupled with early-season (i.e., between bud break and fruit set) sulphur applications scheduled according to a weather-driven disease prediction model, disease severity on bunches was reduced by 98% (vs. an 80% reduction with sulphur sprays alone). Since this new strategy provided very promising results under experimental field conditions, it is being adopted under commercial vineyard conditions in different grapevine-growing areas around Europe within the FP7-KBBE project "Pesticide Use-and-risk Reduction in European farming systems with Integrated Pest Management" (PURE). The use of the biofungicide was tested in 10 vineyards in Italy (2 in the Po Valley, 3 in Tuscany and 5 in Trentino), 2 vineyards in Germany and 3 vineyards in France, for two seasons. The first results confirmed the efficacy of *A. quisqualis* in reducing the overwintering inoculum and delaying the disease onset the following spring. Low efficacy of the biofungicide was observed in few vineyards, which confirmed the need to detect the optimal timing of the application, i.e. when most of the chasmothecia are immature (i.e., in the "yellow stage" of development). This new strategy may have a relevant impact on powdery mildew control in organic viticulture, but may be useful also in the integrated disease management in those vineyards where the chasmothecia population is expected to be high.