

NEW INTEGRATED STRATEGIES FOR THE CONTROL OF GREY MOLD *BOTRYTIS CINEREA* IN GRAPEVINE

C. Hoffmann¹, L. Mugnai², M. Benanchi², I. Pertot³, T. Caffi⁴, N. Ciliberti⁴, S.E. Lelger⁴ and V. Rossi⁴

¹Institute for plant protection in fruit crops and viticulture (JKI), Geilweilerhof, D-76833 Siebeldingen Germany; ²DiPSAA, Sezione Patologia vegetale e Entomologia, Università degli Studi di Firenze, P.le delle Cascine 28, I-50144 Firenze, Italy; ³Istituto per le Protezione delle Piante, CNR, Via Madonna del Piano, 10, I-50019 Sesto fiorentino (FI), Italy; ⁴ Department of sustainable agroecosystems and bioresources, Research and Innovation Centre, Fondazione Endmund Mach (FEM), via E. mach 1, S. Michele all'Adige 38010, Italy; ⁴Istituto di Entomologia e Patologia Vegetale, Università Cattolica del Sacro Cuore, via E. Parmense 84, I-29122 Piacenza, Italy

Grey mould caused by the fungus *Botrytis cinerea* is a common disease on several kinds of ripening fruits, including grape. In addition to quantitative losses, if strongly affected grapes are processed into wine the enzymatic activity of the fungus can have a negative effect on the wine quality. Epidemics are usually initiated in Spring from inoculum produced on different overwintering structures. Leaf infections and, with higher impact, floral infections can generate fruit infections through different infection pathways, some of which include a degree of symptomless latency. Not only environmental conditions but also bunch architecture and berry structure can influence disease severity and incidence: grape varieties with compact clusters are more susceptible to the disease. Traditionally, the control of *B. cinerea* in the vineyard is performed using synthetic fungicides: up to three applications per season, depending on the production line, the weather conditions and the risk a grower wants to take. Within the FP7-KBBE project "Pesticide Use-and-risk Reduction in European farming systems with Integrated Pest Management" (PURE) two different strategies were tested to reduce the use of synthetic fungicides against *B. cinerea* in viticulture: i) create a microclimate less favourable to the pathogen, and ii) use of Biological Control Agents (BCAs). The first strategy was tested at the Julius Kühn-Institute in Siebeldingen (Germany) in the grape growing seasons 2011 and 2012. Manual defoliation of the berry zone was performed before and after flowering to modify the bunch structure of compact varieties and at veraison to enhance ventilation of the berry zone during ripening. Defoliation was compared with one, two and three synthetic fungicides applications. In 2011, with high disease pressure, the defoliation at flowering was as effective as three botryticide treatments, while in 2012 disease pressure was too low to check differences between defoliation and fungicides. In the second strategy, three different BCAs were applied alone or in combination in 3 vineyards located in different geographical areas of Italy. *Bacillus subtilis*, *Aureobasidium pullulans* and *Trichoderma atroviride* were applied at four critical stages for infection: i) before bunch closure, ii) at veraison, iii) 20 days before harvest, and iv) 3-7 days before harvest. In the trials carried out in central Italy, both disease incidence and severity were low (disease severity from 8.9 to 14.6) and all treatments gave a good control of the disease in both years, even when applied alone. In the Po Valley vineyard (northern Italy) disease pressure was low in 2011 and nil in 2012; nonetheless, in 2011 bunches treated with the different BCAs were less affected than the untreated ones. The tested BCAs appeared very promising, especially when applied at the right phenological stages of the vines and under a moderate disease pressure. Further data are necessary to confirm these results with higher disease pressure. Combing the use of defoliation and BCAs with models able to predict both the phenological stage of the plants and the risk of infection would lead to optimize the control of bunch rot in grape.