Alternative seed treatments as a substitute for chemical seed treatments to control common bunt of wheat. M. NOCENTINI1, T. CINELLI1, C. COMPARINI1, S. BENEDETTIELLI, L. MUGNAI.1 1Dipartimento di Scienze delle Produzioni Agroalimentari e dell’Ambiente, University of Florence, Piazzale delle Cascine 28, 50144 Firenze, Italy. E-mail: marconoce@gmail.com

In recent years, the cultivation of ancient wheat varieties has been relaunched, due to their high nutrient and protein composition linked to low gluten content, and good organoleptic characteristics, mainly through the work of organic small-scale farmers. For organic production the seed cannot be treated with synthetic chemicals. This created a serious issue, due to the difficulty to obtain organic seed free from common blunt spores, and all the issues related to “homemade” treatments. For the above reasons, common bunt (caused by Tilletia sp.) became a major seed- and soil-borne disease for organic wheat producers. This study investigated alternative control measures to chemical seed treatments, that are environmentally friendly to support cultivar resistance, are easy to use and can be applied on small farms. Following good results obtained in vitro, against the germination of Tilletia teliospores, several organic products were used in vivo on seed of an ancient bread wheat cv. Sieve, artificially inoculated with Tilletia teliospores. The products being tested are: monoglycerides, Sinapis alba flour, Pseudomonas chlororaphis, copper complexed with a carrier, copper and zinc mixture complexed with citric acid, and peracetic acid. These products were compared with a traditional copper formulation registered for seed treatment, and two synthetic chemical products, one based on fludioxinil and the other a mixture of sedaxane, fludioxonil and difenoconazole. The results obtained in in vitro and in vivo trials will be presented.

Development of integrated disease management of fire blight using biocontrol agents and plant defense activators. S. AIT BAHADOU1,2, A. OUIJJA1, M.A. BOUKHARI2, A. TAHIRI1. 1Laboratory of Plant Biotechnology and Molecular Biology, Moulay Ismail University, Faculty of Sciences; BP 11201, Ave Zitoune Meknes, Morocco. 2 Department of Plant Protection and Environment of the National School of Agriculture-Meknes, Km10, Rte Haj Kaddour, BP S/40, Meknès 50001, Morocco. E-mails: s.ai tbahadou@edu.um.ac.ma, ismail.bahadou@gmail.com

The bacterial antagonists Bacillus subtilis GB03, B. subtilis QST713, B. subtilis Y1336 and Pantoea agglomerans P10c, and plant defense activators acibenzolar-S-methyl (ASM), fosetyl aluminium (F-Al), potassium phosphites (PH) and prohexadione-Ca (ProCa) were evaluated individually and in combinations for control of fire blight in Morocco. Under laboratory conditions, on detached blossoms of apple and pear, only biocontrol treatments based on P. agglomerans P10c and its mixture with B. subtilis QST713 showed reduced the incidence of the disease when compared to other treatments. Under field conditions, the above mixture of biocontrol agents, as well as all other strains, were tested alone or combined with plant defense activators, using a split-split-plot trial design. The treatments were applied on trees at timings based on their respective modes of action. Results showed that P. agglomerans P10c reduced blossom infection by 66%, B. subtilis QST713 by 64%, their 1:1 mixture by 62%, B. subtilis GB03 by 64%, and B. subtilis Y1336 by 53%. For the plant defense activators this reduction was 62% for ASM, 57% for ProCa, 50% for F-Al, and 49% for PH. On shoots, disease reductions ranged from 40% to 80% for the biocontrol agents, and 46% to 97% for the plant defense activators. Two applications of ProCa was the most effective treatment for reducing shoot blight incidence. The combination of plant defense activators and biocontrol agents allowed the greatest protection against blossom and shoot blight, ranging from 76% to 98%. The greatest protection was resulted from B. subtilis QST713, P. agglomerans P10c or their mixture combined with ASM or ProCa.

Harpophora maydis affecting maize in Southern Europe: different growth media, long-term storage and in vitro effects of extracts of Lycium europaeum L. C.M. ORTIZ-BUSTOS1, Y. MONGELÓS1, R. TEJ1, L. MOLINERO-RUIZ1. 1Department of Crop Protection, Institute for Sustainable Agriculture (IAS), Spanish National Research Council (CSIC), Alameda de Obispo s/n, 14004 Córdoba, Spain. 2Multidisciplinary Center of Technological Research (CEMIT), General Direction of Scientific and Technological Research (DGICT), National University of Asunción (UNA), Mcal. Estigarribia Km 10,5, 2169 San Lorenzo, Paraguay. 3Physiology and Biochem-
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