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EFFECT OF CHEMICAL RESISTANCE ACTIVATORS ON PURPLE BLOTCH DISEASE, YIELD AND QUALITY OF THREE ONION CULTIVARS

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Disease resistance can be activated in plants by exposure to certain microorganisms or by treatments with chemicals that trigger specific genes associated with Systemic Acquired Resistance (SAR). The objective of this work was to determine the effect of chemical resistance activators on purple blotch disease (*Alternaria porri*), and on onion yield and quality. The experiment was conducted at the MSU Muck Soil Research Station, Laingsburg, Michigan, on Houghton Muck soil. The experimental design was a split plot design, with four replications. Main plots were the inducing treatments, and subplots were cultivars. One row of each cultivar (Spartan Supreme, Altisimo, and T-439) was planted in each bed. Main plot treatments consisted of the following chemical treatments, sprayed 3 times: 1) acibenzolar-S-methyl (ASM) at 20 ppm, 2) beta-amino butyric acid (BABA) at 10 mM, 3) methyl jasmonate at 10 mM, all first three treatments added to crop oil concentrate (Herbimax 1%); 4) fungicide Bravo Weather Stick 28% (1L a.i./ha) alternated with Kocide 4.5 LF (0.69 L a.i./ha) and Manzate 200 DF (1.65 kg a.i./ha); only Herbimax 1% ; 5) control (non-treated plants). An *A. porri* spore suspension (8500 spores/mL) was sprayed on the plants 82 days after planting. The inoculation occurred 7 days after all the chemical treatments were applied. At 25 days after inoculation (DAI), fungicide and methyl jasmonate treated plants showed 10 and 11 lesions/plant, while untreated plants had 20 lesions/plant. At this same time, plants sprayed with ASM had 24 lesions /plant, and plants treated with BABA showed 15 lesions/plant, which was not statistically different from the untreated plants. Although plants treated with fungicide or methyl jasmonate showed less disease symptoms, this difference was not observed in total and marketable yield, which were 23.5 and 23 t/ha, respectively. After 167 days of storage, there was no difference in the percentage of good (marketable) bulbs between treatments, with an average of 88% good bulbs. In a greenhouse experiment, methyl jasmonate and BABA (both at 10 mM) were sprayed on onions cultivars Hoopla, T-439 and Altisimo, and plants were challenged with *A. porri*. Again, the number of lesions was lower in treated plants at 5 and 10 DAI, when compared to untreated plants or plants sprayed only with surfactant (Herbimax 1%). Histological analysis of the leaf tissue of these plants is in progress, to better elucidate the mechanisms involved in induced resistance expression in onions.