The Effects of Coronatine on Drought Stress Tolerance in Zea mays

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Purpose: Coronatine (COR) is a phytotoxin produced by Pseudomonas syringae. This research tests the effects of COR at low concentrations have on drought stress in varieties of maize to create a more resilient variety to grow in arid regions globally. Procedure: Soak the seeds in the solution of COR & germinate in a dark area. Transport the germinated seedlings to the hydroponics in the Hoagland Nutrient Solution to view the root length. Collect samples & extract the RNA. Complete RT-PCR with the V-167829 MYB(F&R) Primers. Transfer the cDNA to gel electrophoresis & map the V-167829 gene. Simulate drought with PEG-6000 & weigh the samples at different stages. Place them in a blast oven dryer for 72 hours. The difference in weight is the phenotypic change. Results: The lower the concentrations the greater the results in overall drought tolerance. When retesting the 0.001m of COR the gene V-167829 was located on many chromosomes. In the simulated drought, those treated with COR did better than those treated with distilled water, and the damage is irreversible at 96 hours & increasing that time could be the difference of a smallholder farmer feeding their family & community. Conclusions: This study showed 0.001m of COR yielded the greatest overall results. Also, the gene V-167829 was spread across many chromosomes so isolating it would take longer than the time that I had. COR does, in fact, yield overall positive drought tolerance characteristics. However, more research will need to be done to find the genes associated with drought tolerance & create a variety of maize to grow in arid regions globally.

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