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Increasing Maize Tolerance to Drought and Flood with Seed Coating Treatments

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ABSTRACT

The lack of irrigation in regions prone to drought, and flooding due to high rainfall or lack of drainage affects seed viability and the subsequent germination and crop establishment. Seed treatment in the form of coatings shows promise as an effective method to preserve the viability of corn (*Zea mays*) seeds in drought and flood conditions. Chemical formulations may help improve the seed corn vigor under these stressed conditions. This study examined the efficacy of β -aminobutyric acid [BABA] and N-isopropylacrylamide [NIPA] in inducing drought resistance, as well as the ability of lanolin and linseed oil to provide flood tolerance for seed corn. Germination rates and linear shoot growth measurements were used as indications of seed vigor. Uniform coatings of the treatments were applied to untreated seed corn, and treated seed performance was compared to an uncoated control batch of seeds. Water imbibition, moisture, and temperature were manipulated to replicate drought, flood, and optimal growth conditions. The preliminary results of these experiments indicate that these coatings did not significantly increase the viability during short-terms of stressed conditions. At suboptimal temperatures, uncoated control seeds displayed significantly higher seed vigor and growth rates. Manipulation of coating thickness and/or testing at more intense stress levels may be necessary for coating treatments to exhibit positive effects on corn seed resistance to drought and flood.

KEYWORDS

Field Stress, Germination, Seed coatings, Seed corn