AGRONOMIC USE OF 1-MCP TO MITIGATE THE EFFECTS OF STRESS INDUCED ETHYLENE

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Ethylene plays an important role in the response of agronomic crops to abiotic stress. Under stress conditions, ethylene has been shown to regulate crop growth during the vegetative stages by reducing photosynthetic efficiency, reducing leaf area index, reducing plant stature, and accelerating leaf senescence. Ethylene also has significant effects during the crop reproductive stages by regulating flower, kernel, pod and boll abortion, by limiting grain number and grain size, and by limiting photosynthate available to developing reproductive structures via effects on the plant foliage. Suppressing the action of stress-induced ethylene with sprayable formulations of 1-MCP has shown clear benefits in minimizing these negative effects of ethylene in agronomic crops. Research with 1-MCP since 2006 has shown clear benefits to crops under abiotic stress in the areas of increased seed or fruit set, increased grain size, delayed senescence of photosynthetic tissues, increased leaf area index, and improved photosynthetic efficiency. Applying 1-MCP in agronomic crops will allow growers to protect crops from the undesirable effects of ethylene. The potential translation of these effects into yield increases in crop plants - such as corn, cotton, wheat, rice, and soybean - through the timely application of 1-MCP is being investigated at AgroFresh and Syngenta and through several public/private partnerships. The potential uses for 1-MCP in mitigating against the negative effects of stress induced ethylene will be discussed.