

ETHYLENE INHIBITORS INCREASE COTTON FIBER PRODUCTIVITY WHEN SPRAYED AT THE BEGINNING OF REPRODUCTIVE PHASE.

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As part of the mechanism that primarily regulates the protective response of plants against stresses, ethylene is considered a key hormone involved in this response, and increased ethylene synthesis has been observed when plants are subjected to stress. Thus, the development of strategies aimed to mitigate their negative effects can reduce the shed ratio of reproductive structures and positively impact cotton productivity. For this purpose, 1-methylcyclopropene (1-MCP), a compound that inhibits the action of ethylene, and aminoethoxyvinylglycine (AVG), an ethylene synthesis inhibitor, were sprayed on cotton plants at first square and first flower emissions to investigate their effects on the seed cotton yield (SCY), fiber yield (FY), fiber percentage (% Fiber) and final stand of plants (STAND) during two cotton growth seasons (2010 and 2011). Trials were carryout in a randomized complete block design with five replicates for both experiments. The plot size was 4 rows by 5 m, with a row spacing of 0.80 m and a plant density of 9 plants m⁻¹. For the second growth season, the cotton seeds were sowed using a row spacing of 0.45 m and a density of 8 plants m⁻¹. Treatments consisted of (T₁) an untreated control, where just water was applied, (T₂) 1-MCP at 10 g ai ha⁻¹ applied at first square emission with second entry seven days after first application; (T₃) 1-MCP at 10 g ai ha⁻¹ applied at first square emission with other two applications with interval of seven days between each entry, (T₄) 1-MCP at 10 g ai ha⁻¹ sprayed at first flower emission with other two applications with interval of seven days between each entry, (T₅) AVG at 30 g ai ha⁻¹ applied at first square emission with second entry seven days after first application and (T₆) AVG at 30 g ai ha⁻¹ applied at first flower emission with second entry seven days after first application. The dose definition for 1-MCP and AVG considered the results obtained in previous trials. In the first growing season, the 1-MCP applications increased the FY by 135.52 kg ha⁻¹ compared to the untreated control, independently of the application phase (P < 0.045). In the AVG treatments, there was an increase of 178.83kg ha⁻¹ in the FY compared to the untreated control (P < 0.015). Additionally, in the second growth season, the 1-MCP applications increased the FY by 109.50 kg ha⁻¹ compared to the untreated control, independently of the application phase (P < 0.004). In the AVG treatments, there was an increase of 161.75kg ha⁻¹ in the FY compared to the untreated control (P < 0.0001). These results clearly demonstrate that ethylene inhibition in the initial reproductive phase can act not only reduce the ratio of shed squares and allow the plants to sustain higher productivity but can also define the development phase where ethylene production is critical for high cotton yields; being the first record obtained to this purpose in Brazil.