

***Effectiveness of Plant-Based Fungicides from Betel and Neem Leaf in
Controlling Downy Mildew Disease (*Peronosclerospora* sp)
on Maize (*Zea mays* L.)***

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ABSTRACT

Downy mildew disease can reduce corn yield by up to 90%. Continuous chemical control has the potential to cause disease resistance. This study aims to test the effectiveness of plant-based fungicides (betel leaf and neem leaf extracts) in controlling downy mildew disease. The research was conducted in Bugeman Village, Situbondo, East Java (7°48'46"S, 114°20'21"E, 15 m above sea level) from September to December 2025. The research used two treatments, namely botanical fungicides (betel leaf and neem extracts) and chemical fungicides (azoxystrobin and tebuconazole) applied to different plots of land. Data were collected from sample plants (26 plants per population) to assess disease occurrence, downy mildew attack intensity, plant growth, and yield. The research results show that chemical fungicides are more effective in suppressing disease occurrence and downy mildew attack intensity during the early vegetative phase, while botanical fungicides are more effective in suppressing disease occurrence during the early generative phase and do not significantly differ in downy mildew attack intensity. This is based on the fact that the performance of organic materials is slower compared to chemical ones in suppressing disease attacks. On the other hand, the use of chemical fungicides significantly affects plant growth, namely plant height (195.92 cm), number of leaves (14.19 leaves), and stem diameter (19.31 mm) based on the Mann-Whitney test, while plant-based fungicides significantly affect crop yield, namely the dry weight of cobs with husks (304.80 g) and without husks (255.61 g), cob length (19.50 cm), cob diameter (47.53 mm), and seed weight per cob (179.26 g) based on the T-test.

Keywords: botanical fungicide, *Peronosclerospora maydis*, pathogenic fungus