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“ TRANSFORMING SYSTEM AND STRENGTHENING
DEVELOPMENT FOR AGRICULTURAL SUSTAINABILITY ”

November 4 - 5, 2021

KASETSART UNIVERSITY

• • THAILAND • •



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“Transforming System and Strengthening Development for Agricultural Sustainability”

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Oral Presentation

Crop Production and Management/ Ecology

Effects of Brassinosteroids and Gibberellin on Germination, Seedling growth and Enzyme Activities of Soybean Seed at Different Vigor Levels under Low Temperature

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Abstract

Soybean seed vigor is recognized as an important quality that affect early seedling growth under environmental stresses. Brassinosteroids (EBL) and Gibberellin (GA₃) can improve germination, elongation of seedling growth and induce low temperature tolerance. The objective of this study was to evaluate the effects of EBL and GA₃ on seed germination and vigor, seedling growth and enzyme activities of soybean seed at different vigor levels under low temperature. Different soybean seeds vigor levels, CM0701-24, were treated at five concentrations, i.e., 0, 0.50 ppm EBL, 100 ppm GA₃, 0.25 ppm EBL plus 50 ppm GA₃ and 0.50 ppm EBL plus 100 ppm GA₃ and untreated seed as control. After that, the seed samples were sown at 10, 15, 20 and 25°C. The results showed that the treated seeds with 0.25 ppm EBL plus 50 ppm GA₃ were enhanced germination, germination index, shoot length, seedling vigor index and seedling growth rate for low vigor seeds under low temperature. Medium vigor seeds treated with 100 ppm GA₃ and 0.25 ppm EBL plus 50 ppm GA₃ had significantly increased germination, vigor by AA and shoot length. While, high vigor seeds treated with 0.25 ppm EBL plus 50 ppm GA₃ and 0.50 ppm EBL plus 100 ppm GA₃ showed the higher vigor by AA, germination index and shoot length than those of the control under low temperature. All seed vigor levels treated with EBL and GA₃ increased α -amylase and total dehydrogenase activities under all temperatures. It indicated that all vigor seeds treated with 0.25 ppm EBL plus 50 ppm GA₃ could be recommended for germination and the early plant growth of soybean “CM0701-24” under low temperature.

Keywords: α -Amylase, Dehydrogenase, 24-Epibrassinolide, Gibberellic acid, Low temperature, Seed germination, Seed vigor

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Sub-Theme

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