

Effect of ultrasonication duration of polyvinyl alcohol (PVA) gel on characterizations of PVA film

ABSTRACT

Plant growth regulator is one of the major factors affecting sweet corn growth and yield. Although many worldwide studies were done to evaluate the effect of this factor on sweet corn, it is still necessary to do more study to add knowledge in this area because environmental factors will have significant effect on growth and yield of sweet corn. Experiments were performed on August to December 2018 using split plot design with four replications. Analysis of variance (ANOVA) with probability value @ 0.05 using LSD was used to analyse the obtained data. Objective of the experiment was to increase quality component of high plant density using application of plant growth regulators. The experiment was carried out at Institute of Bioscience, UPM, Serdang with application of different type of plant growth regulators (IBA and GA3), different concentrations (0, 50 and 100 mg/l) and time of applications (vegetative and reproductive growth stages). A significant variation in growth rate when GA3 produced the tallest in plant height (4427.068 cm/week), while IBA produced optimum in stem diameter (16.420 cm/week) both at 100 mg/l at vegetative stage. Application of PGR during vegetative stage was the highly significant in cob weight (456.76 g) followed by reproductive stage (444.76 g). Indole-butyric acid produced the optimum significant results on cob length at 18.80 cm compared to gibberellic acid at 18.53 cm. Concentrations stated significant results with the highest was 100 mg/l on cob diameter at 5.66 cm followed by 50 mg/l at 5.46 cm and the lowest was 0 mg/l at 5.26 cm. For quantity components, application IBA at 100 mg/l during vegetative stage produced the highest yield per hectare at 51, 840 kg/ha. This experiment indicated that interaction of plant growth regulators and concentrations in two times of applications would optimize plant growth and afterwards increase yield components.

Keyword: Ultrasonication; Gelatinization; PVA; Residual stress; Lattice strain