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Prediction of Soybean Seed Viability and Quality in Relation to Seed Moisture Content and Storage Temperature

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Abstract

The objective of prediction of soybean seed viability and quality in relation to seed moisture content and storage temperature is to evaluate the viability and quality changes at various conditions and establishing equations for predicting seed quality in relation to seed moisture content and storage temperatures. The experimental design was arranged in Factorial Completely Randomised Design and the multiple regression analysis were used to create predicting equations. Soybean seeds of the cultivar Chiangmai 60 with four initial seed moisture contents of 6, 8, 10 and 12 % and five storage temperatures of 15, 20, 25, 30°C and room temperature were used to store seed for 120 days and the assessment were done every 2 weeks. Standard germination test, vigour test by accelerated aging technique, vigour test by tetrazolium technique, electrical conductivity test, seedling growth rate, fungi infection, protein, lipid and carbohydrate were investigated. The result showed that at the beginning of seed storage the seed qualities were still high and decreased when the period of storage increased in all conditions except percentage of the fungi infect, protein, lipid and carbohydrate contents, did not show any significant difference. The prediction of equations was represented: viability and quality were dependent variable (Y) and initial seed moisture content (X_1) storage temperature (X_2) and period of storage (X_3). The best equation for standard germination is:

$Y = 79.695 + 1.546\ (X_1) + 0.660\ (X_2) + 0.674\ (X_3) - 0.069\ (X_1X_2) - 0.116\ (X_1X_3) - 0.035\ (X_2X_3) - 0.018\ (X_3)^2$ ($R^2 = 0.9340$).

Keywords: Prediction, quality, seed moisture content, soybean seed, storage temperature, viability

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