

Pichai Triratanaprapunta 2014: Development of Suspension Fertilizer Production with Solid Raw Materials. Doctor of Philosophy (Agricultural Research and Development), Major Field: Agricultural Research and Development, Faculty of Agriculture at Kamphaeng Saen. Thesis Advisor: Mr. Suphachai Amkha, Ph.D. 227 pages.

The objectives were to research a new suspension fertilizer process by using solid raw materials instead of liquid raw materials. The research was consisted of 5 experiments. The experiment 1 was aimed to investigate the effects of particle sizes of solid raw materials and speeds of agitator on the solubility of each solid raw material. The experiment 2 was conducted to investigate the effects of temperatures of solution and concentrations of suspending agent on the production of 25-7-7 suspension fertilizer. The experiment 3 was conducted to investigate the effects of stored periods on physical properties of 25-7-7 suspension fertilizers. The experiment 4 was conducted to investigate the effects of stored periods and the various suspension fertilizer grades on chemical and physical properties. The processes were to add 72.1 g Urea 1 in the first stage, simultaneously, 6.6 g xanthan gum, 9.1 g KCl, 29.7 g MKP and 47.5 g Urea 2 in the second stage, respectively, into the cylindrical glass bottle which was mounted to the adjustable speeds and presented 55.0 g of water. The obtained fertilizer was evaluated in chemical and physical properties: N, P₂O₅, K₂O, pH, specific gravity, viscosity, stability, pour-ability and salting out. The experiment 5 was conducted to investigate efficiency in use of 25-7-7 suspension fertilizer on plant growth and yield of Chinese kale. The experiments showed results in Luxen's method that was consisted of 4 factors: 1) particle size of solid raw materials of > 20 meshes, 2) speeds of agitator of 1820 and 2620 rpm, 3) temperature of solution of 30-40°C and 4) suspending agent of xanthan gum. It was the new suspension fertilizer production method that could process various suspension fertilizer grades with both the appropriate chemical and physical properties.

Student's signature

Thesis Advisor's signature