

SUMMARY

Sweet potato production in North Sumatra is still very low compared with the potential of superior varieties that have been released. Efforts to increase the production of sweet potato can be done by way of improvements in farming, such as by giving potassium fertilizer important role in the enlargement and tuber quality and organic fertilizer which can increase the productivity of soil and fertilizer efficiency and reduce the need for fertilizers, especially manure K. This research was carried out to determine and analyze the effect of compost from different sources of biomass materials and the dosage of potassium and its interaction with the growth and production of some varieties of sweet potato. Making compost from biomass materials straw and oil palm empty fruit bunches (with decomposer *Trichoderma harzianum*. Review was done by using separate plots design (split-split plot design) consists of 3 (three) factors, namely: the first factor, as the main plot consists of sweet potato varieties Sari Variety and Variety Beta 2; second factor, as the subplot is the Rice Straw Compost and Compost oil palm empty fruit bunches; third factor, as the kids plot is dose of potassium (K) which consists of 4 levels, namely 0, 75, 150 and 225 kg / ha KCl.

The study shows that the growth and production of sweet potato varieties Sari better than Beta 2 of the study area. Giving the compost can raise levels of organic C, and K-dd K₂O in the soil of compost TKKS although not significantly different from the provision of straw compost. Provision of 225 kg / ha KCl gave the highest growth and production in the study area.

Combination treatment of compost and fertilizer K gives a real difference in biomass dry weight, leaf area, LTR1, uptake of K, K₂O content and organic C in soil. Based parameter dry weight and leaf area at the age of 10 MST, optimization of KCl can be done with the addition of compost that is 150 kg / ha of KCl is given in combination with compost oil palm empty fruit bunches or 225 kg of KCl is given in combination with straw compost.

Use of two varieties of sweet potato by using the application of compost and different doses of K showed no significant effect on the production of tuber crops, but the optimal growth of sweet potato obtained by using a variety of applied Sari oil palm empty fruit bunches using compost as a source of organic material with the addition of 150 kg / ha KCl.

Key words: sweet potato, compost fertilizer, potassium fertilizer, rice straw, palm empty fruit bunches SAIT, *Trichoderma harzianum*