

Siwaporn Toopakuntho 2010: Nitrogen Fixation of Free Living Microorganism in No Tillage Sweet Corn Cultivation System. Master of Science (Soil Science), Major Field: Soil Science, Department of Soil Science. Thesis Advisor: Associate Professor Thongchai Mala, Ph.D. 74 pages.

The research on the nitrogen fixation of free living microorganism and their effects on sweet corn yield in no tillage system aimed to monitor the population of nitrogen fixing microorganisms, rate of nitrogen fixation and their effects on sweet corn yield in no tillage system. The experimental set up was split plot in randomized complete block design with 4 replications. Main plots (tillage systems) consisted of conventional tillage and no tillage, while sub plots (sources of plant mineral) consisted of 1) control 2) chemical fertilizer 19 kg N /rai (normal rate) 3) chemical fertilizer 9.5 kg N /rai (half rate) 4) azotobacter inoculation 5) azospirillum inoculation 6) soybean green manure and 7) mungbean green manure. The results showed no significant of nitrogen fixing microorganisms population, rate of nitrogen fixation, yield, nitrogen, phosphorus and potassium content of plant under various tillage systems, but various sources of plant mineral had significant effect on them. The population of azotobacter and azospirillum were increased in azotobacter and azospirillum application treatments. Azotobacter treatment had the highest nitrogen fixation in soil ( $6.694 \text{ mg N / hr / m}^2$ ), while those of azospirillum, soybean green manure and mungbean green manure treatments were lower, successively. Nitrogen fixation in root from azospirillum treatment was the highest ( $0.125 \text{ mg N / hr / m}^2$ ). Yield of the standard ears from azotobacter, azospirillum and mungbean green manure treatments appeared in the same level as that from the treatment of half rate of chemical fertilizer, while those from normal rate of chemical fertilizer treatment was the highest ( $1,538.61 \text{ kg / rai}$ ). Sources of plant mineral influenced to nitrogen content of plant. However, various sources of plant mineral have no effect to phosphorus and potassium content of plant and some properties of soil after harvest.

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Thesis Advisor's signature