

## Utilization of biotechnology to increase cassava yield in Pak-Chong Soil Series

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### Abstract

Utilization of biotechnology to increase cassava yield in Pak-Chong soil series was conducted at Soil and Water Conservation Development Study Center, Pak-Chong district; Nakhon Ratchasima province during 2004-2007. The objectives of the research are to study soil chemical changes, growth and yield of cassava and the economic return. Randomized complete block design was used composing of 10 treatments and 3 replications which were: 1) control 2) farmer practice (15-15-15, 50 kg./rai) 3) *Canavalia ensiformis* as green manure mulching with *Vigna unguiculata* 4) *Canavalia ensiformis* as green manure mulching with *Vigna unguiculata* and sprayed with liquid organic fertilizer 5) *Crotalaria juncea* as green manure mulching with *Vigna unguiculata* 6) *Crotalaria juncea* as green manure mulching with *Vigna unguiculata* and sprayed with liquid organic fertilizer 7) *Crotalaria juncea* as green manure mulching with *Canavalia ensiformis* 8) *Crotalaria juncea* as green manure mulching with *Canavalia ensiformis* and sprayed with liquid organic fertilizer 9) *Vigna unguiculata* as green manure mulching with *Canavalia ensiformis* 10) *Vigna unguiculata* as green manure mulching with *Canavalia ensiformis* and sprayed with liquid organic fertilizer.

The results showed that plots applied with green manure and mulching after 3 years soil organic matter increased from 2.31% to 2.93% and potassium from 574.70 to 959.00 mg./kg. Utilization of biotechnology and chemical fertilizer were insignificant difference effect on increasing growth and yield of cassava. Besides using green manure, mulching and sprayed with liquid organic fertilizer, cassava tends to give 3.4 ton/rai of stem biomass and 5.1 ton/rai of yield which higher than without liquid organic fertilizer. For the first 2 years, cassava yield was rather low due to the cost of incorporation of green manure and sprayed with liquid organic fertilizer, the economic return was also low. However, in the third year, utilization of biotechnology gave cassava yield higher than chemical fertilizer, which gave average income 6,238.66 Baht/rai and 5,680 Baht/rai respectively. The results concluded that the most appropriate treatment was the incorporation of *Vigna unguiculata* as green manure mulching with *Canavalia ensiformis* and sprayed with liquid organic fertilizer, which gave the highest of cassava yield and economic return of average 3 years with 5.21 ton/rai and 2,765.53 Baht/rai

**Keywords:** biotechnology, green manure, *Crotalaria juncea*, *Vigna unguiculata*, *Canavalia ensiformis*, liquid organic fertilizer, cassava, Pak-Chong soil series