RINGKASAN

Aprilia Solyati. 125040200111199. **Pengaruh Sistem Olah Tanah dan Aplikasi Mulsa terhadap Sifat Fisik, Perakaran, dan Hasil Tanaman Kacang Hijau (*Vigna radiata* L.)** dibawah bimbingan **Prof. Dr. Ir. Zaenal Kusuma, SU**

Pengolahan lahan intensif dalam jangka panjang menyebabkan degradasi lahan yang menimbulkan kerusakan sifat tanah. Degradasi lahan dapat dikembalikan dengan pengelolaan lahan yang tepat. Selain pengolahan tanah, sifat fisik tanah dapat diperbaiki dengan pemberian mulsa. Kebiasaan petani membiarkan lahan setelah panen padi (bera) dapat dimanfaatkan dengan menanam tanaman umur pendek seperti kacang hijau. Tujuan penelitian ialah mengetahui pengaruh kombinasi sistem olah tanah dan aplikasi mulsa terhadap sifat fisik tanah, perakaran, dan hasil tanaman kacang hijau. Hipotesis yang diajukan pada penelitian ini ialah kombinasi sistem olah tanah minimum dan aplikasi mulsa jerami memiliki pengaruh terbaik terhadap sifat fisik, perakaran dan hasil tanaman.

Penelitian dilaksanakan pada bulan Maret-Mei 2016 di Desa Pendem, Kecamatan Junrejo, Kota Batu. Penelitian dilakukan dengan menggunakan Rancangan Acak Kelompok Faktorial (RAKF) dengan 2 faktor yang masing – masing faktor memiliki 3 taraf. Faktor pertama adalah olah tanah (T) dan faktor kedua adalah aplikasi mulsa (M), sehingga total kombinasi antar faktor adalah 9 perlakuan. Setiap satu perlakuan dibuat satu petak dan diulang 3 kali. Sehingga total perlakuan atau petak percobaan adalah 27 petak. Terdiri dari tanpa olah tanah (T0), olah tanah minimum (T1), olah tanah maksimum (T2), tanpa mulsa (M0), mulsa plastik hitam perak (M1), dan mulsa jerami (M2). T0M0 = tanpa olah tanah +tanpa mulsa, T0M1 = tanpa olah tanah + mulsa plastik hitam perak, T0M2 = tanpa olah tanah + mulsa jerami, T1M0 = olah tanah minimum + tanpa mulsa, T1M1 = olah tanah minimum + mulsa plastik hitam perak, T1M2 = olah tanah minimum + mulsa jerami, T2M0 = olah tanah maksimum + tanpa mulsa, T2M1 = olah tanah maksimum + mulsa plastik hitam perak, T2M2 = olah tanah maksimum + mulsa jerami. Pengamatan yang dilakukan terdiri dari pengamatan sifat fisik tanah yaitu BI, BJ, kemantapan agregat, porositas, kadar air tersedia, perakaran tanaman dan hasil tanaman. Data pengamatan dianalisis dengan menggunakan analisis ragam (uji F) pada taraf 5% dan dilanjutkan dengan uji BNT pada taraf nyata 5% untuk mengetahui perbedaan diantara perlakuan.

Interaksi antar faktor terjadi pada umur tanaman 14 hst, nilai terbaik pada BI tanah dan Porositas total ditunjukkan oleh sistem olah tanah minimum dengan aplikasi mulsa jerami padi (T1M2). Kemantapan Agregat terkuat ditunjukkan oleh sistem olah tanah minimum dengan aplikasi mulsa hitam perak plastik (T1M1). Perlakuan belum memiliki pengaruh nyata terhadap BJ tanah. Perlakuan olah tanah minimum tanpa aplikasi mulsa (T1M0) memiliki kadar air tersedia tertinggi. Perlakuan sistem olah tanah minimum dengan aplikasi mulsa jerami padi memiliki akar terbaik dengan panjang akar 67 cm dengan massa akar 5,11 g, dan memiliki polong total terbanyak dengan massa 65,76 g. Sistem olah tanah minimum dengan aplikasi mulsa jerami merupakan perlakuan terbaik dari seluruh kombinasi karena memiliki nilai terbaik dalam BI, porositas, perakaran, dan hasil tanaman kacang hijau. Pengaruh hanya terjadi dalam jangka pendek yaitu 14 HST, sedangkan setelah panen (60 HST) belum ada pengaruh.

SUMMARY

Aprilia Solyati. 125040200111199. **Effect of Soil Tillage and Mulch on Soil Physics, Roots, Green Bean (*Vigna Radiata* L.) Production** under the guidance of **Prof. Dr. Ir. Zaenal Kusuma, SU**

Long term intensive tillage cause land degradation or damage soil properties and can be restored with proper soil management. Besides tillage, soil physical properties can be improved by mulching. The habits of farmers left their fields after the rice harvest (fallow) can be utilized by planting crops such as green beans short lifes plant. The purpose of the research to know the effect of tillage systems and application of mulch on soil physical properties, rooting, and production of green beans. The hypothesis proposed in this study is combination of minimum tillage system and straw mulch application gave the best effect on the physical properties, rooting and crop production.

The experiment was conducted in March - May 2016 in the village of Pendem, Junrejo District, Batu City. The study was conducted using a Randomized Block Design Factorial (RBDF) with two factor and each factor has 3 levels. The first factor is the tillage (T) and the second factor is the application of mulch (M), so that the total combination of the factors is 9 treatments. Each one is made of the plot and the treatment was repeated 3 times. So that the total treatment or the experimental plot was 27 plot. The treatment are, no tillage (T0), minimum tillage(T1), intensive tillage (T2), without mulch (M0), silvery black plastic mulch (M1), and straw mulch (M2). T0M0 = no tillage + without mulch, T0M1 = no tillage + silvery black plastic mulch, T0M2 = no tillage + straw mulch, T1M0 = minimum tillage + without mulch, T1M1 = minimum tillage + silvery black plastic mulch, T1M2 = minimum tillage + straw mulch, T2M0 = intensive tillage + without mulch, T2M1 = intensive tillage + silvery black plastic mulch, T2M2 = intensive tillage + straw mulch. The observations made consisted of observations of physical properties of soil that bulk density, particle density, aggregate stability, porosity, available water content, roots plant, and produce of green bean. Data were analyzed using analysis of variance (F test) at 5% level and continued with LSD at 5% significance level to determine differences among treatments.

Interaction between factors occur at the age of 14 day after planting. The best value in bulk density and porosity total indicated by the system of minimum tillage with straw mulch application. Aggregate stability strongest shown by the minimum tillage system with silvery black plastic mulch application. The treatment did not gave a significant effect on the soil particle density. Treatment of minimum tillage without mulch application has the highest available water content. The treatment system of minimum tillage with straw mulch application has the best root with 67 cm length and mass root of 5.11 g, and has pods with the highest total mass of 65.76 g. The system of minimum tillage with straw mulch application is the best treatment of all combinations because it has the best value in bulk density, porosity total, roots, and the produce of green bean. The effect just occur on the short term, that is 14 days after planting, whereas after harvest (60 HST) there are not effected.