

RINGKASAN

Kubis bunga merupakan sayuran yang memiliki prospek yang tinggi karena mempunyai nilai ekonomi dan permintaan pasar yang tinggi. Saat ini tanaman kubis bunga kebanyakan dibudidayakan di daerah subtropis yang dingin, dengan wilayah adaptasinya berada di daerah dataran tinggi karena kubis bunga membutuhkan suhu tertentu untuk pembentukan bunganya. Namun produksi baik secara kuantitas dan kualitas yang masih rendah disebabkan antara lain kualitas tanah yang keras, kurangnya unsur hara, pengaruh hama dan penyakit, pengaruh cuaca dan iklim, serta teknis budidaya oleh petani. Peningkatan produksi kubis bunga dapat dilakukan dengan perbaikan budidaya, salah satunya dengan pemberian mulsa. Pemberian mulsa jerami dan mulsa plastik hitam perak pada pertanaman kubis bunga memiliki berbagai keuntungan, sebab membuat tanah menjadi tetap lembab selanjutnya akar tanaman dapat melakukan aktivitas secara normal dan optimal. Tujuan yang ingin dicapai dari penelitian ini adalah dapat mengetahui pengaruh aplikasi jenis mulsa terhadap sifat fisik tanah pada budidaya kubis bunga (*Brassica oleracea* var. *botrytis* L.) di lahan marginal dan mengklasifikasi hubungan antar variabel sifat fisik tanah yang diamati.

Penelitian dilaksanakan di Desa Sirau, Dusun Bulusari, RT 02/RW 01, Kecamatan Kemranjen, Kabupaten Banyumas, Jawa Tengah. Letak geografis lokasi penelitian adalah 7°37'06.52"LS – 7°37'07.42"LS dan 109°17'42.68"BT – 109°17'43.05"BT dengan ketinggian tempat 10 m diatas permukaan laut (mdpl). Pengamatan sampel sifat fisik tanah dilaksanakan di Laboratorium Teknologi Pertanian, Fakultas Pertanian, Universitas Jenderal Soedirman. Penelitian telah dilaksanakan dari bulan Juni hingga September 2024. Pengambilan sampel tanah tidak terganggu dilakukan menggunakan *ring sampler* berukuran 100 cm³ (diameter 5 cm dan tinggi 5 cm) setiap 1 minggu sekali selama 5 minggu pengamatan yaitu 7, 14, 21, 28, dan 35 hari setelah tanam pada 3 kedalaman tanah yaitu, 0 – 10, 10 – 20, dan 20 – 30 cm. Pada masing-masing kedalaman dilakukan 3 kali pengulangan pengambilan sampel untuk setiap kombinasi perlakuan (P₀M₀, P₁M₀, P₁M₁, dan P₁M₂). Dengan demikian akan diperoleh sejumlah 5 x 3 x 3 x 4 = 180 sampel. Variabel yang diamati adalah kadar air tanah basis kering, *dry bulk density*, porositas tanah dan permeabilitas tanah. Analisis data menggunakan metode *Student T Test* dan metode ANOVA dilanjutkan dengan Uji DMRT 5%. Metode analisis regresi untuk mengetahui hubungan antar sifat fisik tanah.

Perlakuan mulsa jerami berpengaruh terhadap kadar air tanah basis kering, *dry bulk density*, porositas tanah, dan permeabilitas tanah di lapisan tanah bagian atas. Perlakuan mulsa plastik hitam perak berpengaruh terhadap kadar air tanah basis kering, *dry bulk density*, porositas tanah, dan permeabilitas tanah di lapisan tanah bagian bawah. Berdasarkan hasil regresi yang dilakukan, dihasilkan beberapa hubungan antar variabel sifat fisik tanah yang diamati. Linier negatif antara *dry bulk density* dan permeabilitas tanah dengan nilai R² sebesar 0,2080. Linier positif antara porositas tanah dan permeabilitas tanah dengan nilai R² sebesar 0,2080. Linier positif antara kadar air tanah basis kering dan permeabilitas tanah dengan nilai R² sebesar 0,1610.

SUMMARY

Cauliflower was a vegetable that had high prospects because it had economic value and high market demand. At that time, cauliflower plants were mostly cultivated in cold subtropical regions, with their adaptation areas located in highlands because cauliflower required a certain temperature for flower formation. However, production in terms of both quantity and quality was still low, caused among others by hard soil conditions, lack of nutrients, the influence of pests and diseases, weather and climate effects, as well as cultivation techniques by farmers. The increase of cauliflower production could be carried out through improved cultivation, one of which was the application of mulch. The application of straw mulch and silver-black plastic mulch on cauliflower cultivation had various advantages, since it kept the soil moist so that the plant roots could perform their activities normally and optimally. The objective aimed to be achieved from this research was to determine the effect of different types of mulch application on soil physical properties in cauliflower (*Brassica oleracea* var. *botrytis* L.) cultivation on marginal land and to classify the relationship among the observed soil physical property variables.

The research was carried out in Sirau Village, Bulusari Hamlet, RT 02/RW 01, Kemranjen Sub-district, Banyumas Regency, Central Java. The geographical coordinates of the research site were $7^{\circ}37'06.52''\text{S}$ – $7^{\circ}37'07.42''\text{S}$ and $109^{\circ}17'42.68''\text{E}$ – $109^{\circ}17'43.05''\text{E}$ with an altitude of 10 m above sea level. The observation of soil physical property samples was conducted at the Agricultural Technology Laboratory, Faculty of Agriculture, Jenderal Soedirman University. The research was conducted from June to September 2024. Undisturbed soil sampling was carried out using a ring sampler with a volume of 100 cm^3 (5 cm diameter and 5 cm height) once every week for 5 weeks of observation, namely at 7, 14, 21, 28, and 35 days after planting, at three soil depths: 0 – 10 cm, 10 – 20 cm, and 20 – 30 cm. At each depth, three replications of soil sampling were conducted for each treatment combination (P_0M_0 , P_1M_0 , P_1M_1 , and P_1M_2). Thus, a total of $5 \times 3 \times 3 \times 4 = 180$ samples were obtained. The variables observed were soil water content on a dry weight basis, dry bulk density, soil porosity, and soil permeability. Data were analyzed using the Student's T-Test and ANOVA, followed by DMRT at a 5% significance level. Regression analysis was used to determine the relationships among soil physical properties.

The straw mulch treatment affected soil water content on a dry weight basis, dry bulk density, soil porosity, and soil permeability in the upper soil layer. The silver-black plastic mulch treatment affected soil water content on a dry weight basis, dry bulk density, soil porosity, and soil permeability in the lower soil layer. Based on the regression analysis that was carried out, several relationships among the observed soil physical property variables were obtained. A negative linear relationship was found between dry bulk density and soil permeability with an R^2 value of 0.2080. A positive linear relationship was found between soil porosity and soil permeability with an R^2 value of 0.2080. A positive linear relationship was also found between soil water content on a dry weight basis and soil permeability with an R^2 value of 0.1610.