INTISARI

Kemampuan tanah mengikat air (retensi air) sangat dipengaruhi oleh sifat fisik tanah. Pemberian bahan organik padat merupakan salah satu cara memperbaiki sifat fisik tanah. Bahan organik memiliki kemampuan agregasi yaitu mengikat butiran-butiran kecil menjadi butiran yang lebih besar sehingga dapat menambah kapasitas menahan air. Perlu diketahui komposisi tanah dan bahan organik yang memiliki kemampuan mengikat air paling optimum. Penelitian ini bertujuan menganalisis hubungan antara pemberian 0%, 29%, 33%, 40%, 50%, 60%, 67% dan 71% bahan organik berupa pupuk kascing pada jenis tanah *loam* (Bantul) dan *sandy loam* (Maguwo) terhadap sifat fisik tanah yaitu tekstur, *specific gravity*, rapat massa, permeabilitas, kenaikan kapiler air, kadar air, kurva pF, kemampuan mengikat air (retensi air), perkolasi, evaporasi dan neraca air.

Kurva pF digunakan untuk mengetahui kemampuan tanah mengikat air. Konsep *water balance* (neraca air) diaplikasikan untuk mengetahui perkolasi, evaporasi dan komposisi yang memiliki retensi air paling optimum.

Hasil penelitian menunjukkan semakin tinggi dosis pemberian bahan organik maka *spesific gravity*, rapat massa dan kenaikan kapiler tanah semakin kecil. Semakin tinggi dosis pemberian bahan organik maka nilai porositas, angka pori dan permeabilitas tanah semakin tinggi. Kemampuan mengikat air (KMA) optimum tanah Bantul adalah pada persentase bahan organik 40% yaitu sebesar 19,14% atau 38,29 mm. Tanah asli Bantul memiliki banyak partikel *clay*. Pemberian bahan organik dengan tepat pada tanah Bantul meningkatkan pori air tersedia karena bahan organic mampu mengikat partikel kecil menjadi partikel yang lebih besar.KMA pada tanah Maguwo adalah tanah asli (persentase bahan organik 0%) yaitu sebesar 27,87% atau 55,73 mm. Tanah asli Maguwo memiliki ruang pori yang baik untuk menyimpan air. Tanah Maguwo memiliki gradasi *sand, silt* dan *clay* yang baik sehingga membentuk banyak pori air tersedia. Pemberian bahan organik untuk tanah Maguwo tidak meningkatkan KMA. Hal ini terjadi karena bahan organic berfungsi sebagai granulator membentuk pori yang lebih besar dari tanah asli sehingga pori air tersedia berubah menjadi pori drainase. Pori drainase tersebut yang menyebabkan air cepat keluar dari tanah. Evaporasi terendah tanah Bantul 2,25 mm pada persentase pupuk 40% dan 50%, tanah Maguwo 2,32 pada persentase pupuk 29%. Perkolasi terendah tanah Bantul 10,48 mm pada persentase pupuk 0% dan 14,74 mm pada persentase pupuk 71%, tanah Maguwo 9,12 mm pada persentase pupuk 67%. Neraca air optimum tanah Bantul pada kondisi kapasitas lapang dan setelah evaporasi adalah 36,04 mm pada persentase pupuk 40% dan tanah Maguwo 73,29 mm pada persentase pupuk 0%.

Kata kunci: Pupuk Kascing, Sifat Fisik Tanah, Kehilangan Air, Neraca Air.

ABSTRACK

Water holding capacity (water retention) is strongly affected by the soil physical properties. Giving solid organic material is one way to improve soil physical properties. Soil organic matter has the aggregation capability that can bind small granules into larger granules to increase water holding capacity. It is important to know the composition of soil and organic matter that has the optimum water retention. This study aimed to analyze the effect of additional 0%, 29%, 33%, 40%, 50%, 60%, 67% and 71% of organic material such as kascing manure on loam soil (Bantul) and sandy loam soil (Maguwo) against the soil texture, specific gravity, density, permeability, capillary rise of water, soil moisture content, pF curve, water holding capacity (water retention), percolation, evaporation and water balance.

PF curve was used to determine water holding capacity. The concept of water balance was applied to determine the percolation, evaporation and composition that has the most optimum water holding capacity.

The results showed the higher the dose of organic matter, the specific gravity, density and capillary rise were getting smaller, while the higher the dose of organic matter, the porosity, permeability and void ratio were getting higher. The optimum water holding capacity (WHC) of Bantul soil was 19,14% or 38,29 mm by added 40% of organic manure. Original soil of Bantul has many clay particles. By applying organic manure with certain dose in it, available water pores increased because organic matter can bind the small particles into the larger particles. The optimum WHC of Maguwo soil was 27,87% or 55,73 mm by added 0% organic manure (original soil). The original soil of Maguwo has a good pore space to save the water. It has good gradation particles of sand, silt and clay that made a lot of available water pores. WHC of Maguwo soil not increased by added organic matter. It happened because the organic matter as a granulator formed the larger pores than before so the available water pores transformed to drainage pore. That pore caused the easy movement of water in soil. The minimum soil evaporation of Bantul soil was 2,25 mm by added 40% and 50% organic manure, while Maguwo soil was 2.32 mm by added 29% organic manure. The minimum percolation of Bantul soil was 10,48 mm and 14,74 mm by added 0% and 71% organic manure, while Maguwo soil was 9,12 mm by added 67% organic material. The optimum soil water balance of Bantul at field capacity and after evaporation was 36,04 mm by added 40% organic manure, while Maguwo soil was 73,29 mm by added 0% organic manure.

Keywords: Kascing Manure, Soil Physical Properties, Water Losses, Water Balance.