RINGKASAN

Budidaya kentang konvensional umumnya menggunakan guludan vertikal yang berdampak tingginya erosi. Penerapan guludan horizontal terbukti mampu mengurangi erosi hingga 73% namun menurunkan produktivitas tanaman. Hal tersebut dikarenakan guludan horizontal lebih banyak menyimpan air, sehingga diperlukannya penelitian terkait distribusi spasial kadar air pada guludan horizontal yang dapat digunakan dalam penentuan pembuatan drainase. Penelitian ini bertujuan untuk mengetahui pola spasial air tanah serta pengaruh variasi dimensi dan kemiringan guludan terhadap distribusi kadar air tanah pada budidaya tanaman kentang dengan sistem guludan horizontal.

Penelitian dilaksanakan pada bulan Mei – November 2017 pada lahan pertanian tanaman hortikultura Desa Serang Kecamatan Karangreja Kabupaten Purbalingga dan dianalisis pada bulan Februari – April 2019 di Laboratorium Teknik Pengendalian Bio-Lingkungan, Fakultas Pertanian, Universitas Jenderal Soedirman. Variabel yang diamati yaitu kadar air volumetrik tanah guludan dengan tinggi 30 cm dan 3 perbedaan lebar guludan yaitu 30 cm, 40 cm dan 50 cm di 3 kemiringan yaitu 5%, 15% dan 30%.

Hasil penelitian menunjukkan bahwa distribusi kadar air pada masing-masing dimensi dan kemiringan memiliki pola yang berbeda-beda dan mengalami perubahan pada masing-masing kedalamannya dimana keterkaitan kadar air cenderung memiliki *range* yang semakin kecil dengan bertambahnya kedalaman. Selain itu, semakin besar persentase kemiringan demplot maka nilai *range* kadar air yang terkorelasi cenderung semakin besar. Kadar air tanah di demplot kemiringan 5% pada lebar guludan 30 cm, 40 cm dan 50 cm rata-rata terkorelasi pada *range* berturut-turut 0,5 – 1,5 m, 0,5 - 3 m dan 1 - 1,5 m dengan nilai *sill* berturut-turut berkisar pada 0,001 – 0,003; 0,002 – 0,003; dan 0,003. Pada demplot kemiringan 15% dengan lebar guludan 30 cm, 40 cm dan 50 cm, kadar air tanah rata-rata terkorelasi pada *range* berturut-turut 0,5 – 1,5 m, 0,5 – 3 m dan 0,5 – 1 m dengan nilai *sill* berturut-turut berkisar pada 0,001 – 0,003; 0,001 – 0,002; dan 0,001 – 0,002. Kadar air tanah di demplot kemiringan 30% pada lebar guludan 30 cm, 40 cm dan 50 cm rata-rata terkorelasi pada jarak berturut-turut 0,5 – 3 m, 2,5 – 3 m dan 0,5 – 1,5 m dengan nilai *sill* berturut-turut berkisar pada 0,001 – 0,003; 0,002 – 0,003; dan 0,001 – 0,002. Sedangkan berdasarkan lebar dimensi guludan, *range* terkorelasinya kadar air paling besar pada lebar 40 cm yaitu rata-rata pada kisaran 1 – 3 m, sedangkan pada lebar 30 cm dan 50 cm *range* terkorelasinya kadar air yaitu pada kisaran 0,5 – 1,5 cm.

SUMMARY

Conventional cultivation of potatoes generally uses vertical ridges that have high risk of erosion. The application of horizontal ridges has been proven to reduce erosion up to 73% but reduce crop productivity. This is because horizontal ridges store more water, so research is needed regarding the spatial distribution of soil water content in horizontal ridges that can be used in determining drainage making. This study aims to determine the spatial pattern of soil water content and the effect of variations in dimensions and slope of the ridges on the distribution of soil water content in potato crop cultivation with a horizontal ridges system.

The study was conducted in May - November 2017 on horticulture crop farms in Serang Village, Karangreja Sub-District, Purbalingga Regency and analyzed in February-April 2019 at the Bio-Environmental Control Engineering Laboratory, Faculty of Agriculture, Jenderal Soedirman University. The variables observed were volumetric water content of ground ridges with a height of 30 cm and 3 differences in the width of the ridges, namely 30 cm, 40 cm and 50 cm in 3 slopes namely 5%, 15% and 30%.

The results showed that the distribution of water content in each dimension and slope had different patterns and experienced changes at each depth where the association of water content tended to have a smaller range with increasing depth. In addition, the greater the slope percentage of the demonstration plot, the correlated water content range values tend to be greater. The level of soil water content in the 5% slope demplot on the width of the ridge 30 cm, 40 cm and 50 cm the average is correlated in the successive ranges of 0.5 - 1.5 m, 0.5 - 3 m and 1 - 1.5 m with sill values in a row ranging from 0.001 - 0.003, 0.002 - 0.003, and 0.003. In the 15% slope demplot with a width of 30 cm, 40 cm and 50 cm, the average soil moisture content is correlated in successive ranges of 0.5 - 1.5 m, 0.5 - 3 m and 0.5 - 1 m with sill values in a row ranging from 0.001 - 0.003, 0.001 - 0.002, and 0.001 - 0.002. The level of groundwater in the 30% slope demplot on the width of the ridge 30 cm, 40 cm and 50 cm the average correlated at a distance of 0.5 - 3 m, 2.5 - 3 m and 0.5 - 1.5 m with sill values in a row ranging from 0.001 - 0.003, 0.002 - 0.003, and 0.001 - 0.002. Whereas based on the width of the ridge dimensions, the correlation range of the water content is greatest at 40 cm width, which is on average in the range 1-3 m, while in the width of 30 cm and 50 cm the range of correlated water content is in the range 0.5 - 1.5 cm.