

RINGKASAN

Di Indonesia kentang pada umumnya dibudidayakan di dataran tinggi secara konvensional seperti penggunaan sistem guludan vertikal dan penggunaan pupuk/pestisida kimia yang dapat berdampak negatif pada kelestarian lingkungan. Budidaya kentang secara konvensional menyebabkan erosi yang tidak terkendalikan. Penerapan sistem guludan horizontal pada budidaya kentang terbukti cukup efektif mengendalikan erosi, namun belum optimal meningkatkan produktifitas tanaman terutama pada musim hujan akibat kondisi *waterlogged* pada guludan. Oleh karena itu, diperlukan pengembangan sistem guludan horizontal yang dipadukan dengan sistem penanaman tumpang sari, guna meningkatkan keefektifan guludan horizontal dalam menunjang produktivitas kentang maupun upaya konservasi lingkungan. Penelitian ini bertujuan untuk mengetahui dinamika air dan nutrisi tanah pada demplot tumpang sari tanaman kentang atlantik dan teh dengan sistem guludan horizontal serta variasi jenis pupuk dan mulsa.

Penelitian ini dilakukan di demplot tumpang sari tanaman kentang dan teh yang berlokasi di Desa Pandansari, Kecamatan Paguyangan, Kabupaten Brebes, serta di Laboratorium Tanah dan Sumberdaya Lahan Universitas Jenderal Soedirman, Purwokerto, Provinsi Jawa Tengah. Penelitian ini menggunakan 2 faktor perlakuan, yaitu jenis pupuk (organik dan kimia) dan mulsa (mulsa plastik, mulsa jerami dan tanpa mulsa). Jadi terdapat 6 kombinasi perlakuan yaitu: mulsa plastik pupuk organik (MPPO), mulsa jerami pupuk organik (MJPO), tanpa mulsa pupuk organik (TMPO), mulsa plastik pupuk kimia (MPPK), mulsa jerami pupuk kimia (MJPK), dan tanpa mulsa pupuk kimia (TMPK). Keseluruhan data diambil secara destruktif, dianalisis dengan metode neraca kesetimbangan materi (*material balance*), serta ditampilkan dalam bentuk grafis.

Hasil penelitian menunjukkan bahwa dinamika air yang diwakili oleh *Run-off* dan perkolasi pada perlakuan MPPO, MJPO, TMPO, MPPK, MJPK dan TMPK berturut-turut yaitu: 16,88; 21,74; 30,38; 17,03; 23,39; 24,34 mm untuk *Run-off* N dan 133,76; 128,89; 120,26; 133,60; 127,24; 126,30 mm untuk *Run-off* P. Dinamika nutrisi yang diwakili oleh *Run-off*/perkolasi dan serapan nutrisi tanaman. *Run-off*/perkolasi pada perlakuan yang sama berturut-turut yaitu 320,29; 3113,63; 327,84; 296,15; 342,60 dan 299,80 kg/ha untuk N dan 950,01; 953,44; 940,56; 894,95; 849,23; dan 895,79 kg/ha untuk P. Serapan N tanaman pada perlakuan yang sama berturut-turut yaitu 103,5; 110,16; 95,95; 128,86; 82,40 dan 125,20 kg/ha dan serapan nutrisi P tanaman berturut-turut yaitu 37,6; 33,64; 46,52; 45,34; 91,05 dan 44,50 kg/ha. Dari hasil tersebut kombinasi penggunaan mulsa dan pupuk yang tepat adalah kombinasi mulsa plastik pupuk kimia.

SUMMARY

In Indonesia, potato crop is commonly cultivated at highlands with conventional method, for instance, by using the vertical ridge system and chemical fertilizer/pesticide, which in turn might have negative impact to environmental sustainability. More specifically, the method might cause severe and uncontrollable erosion. On the other hand, the application of the horizontal ridge system in potato crop cultivation has been proven to be effective to control erosion, but it has been yet ineffective to enhance the productivity, especially in rainy season, due to waterlogged condition. Therefore, it is necessary to further develop the horizontal ridge system to be combined with intercropping system to improve the effectiveness to maintain the productivity as well as the environmental conservation.

This research was aimed to determine soil water and nutrients dynamics on the potato and tea intercropping plots under horizontal ridge system with various type of fertilizer and mulches. The research was conducted in the potato and tea intercropping plots located in Pandansari village, Paguyangan district, Brebes regency, and in Laboratory of Soil and Land Resources, Jenderal Soedirman University, Purwokerto, Central Java province. The experiment was performed using two treated factors, namely fertilizer (organic and chemical fertilizer) and mulch (plastic, rice-straw, and no-mulch), thus there were totally six treated factor combinations, namely: plastic mulch with organic fertilizer (MPPO), rice-straw mulch with organic fertilizer (MJPO), no-mulch with organic fertilizer (TMPO), plastic mulch with chemical fertilizer (MPPK), rice-straw mulch with chemical fertilizer (MJPK), and no-mulch with chemical fertilizer (TMPK). The entire data were collected destructively, analyzed using material balance method, and presented graphically.

The results showed that water dynamics represented by Run-off and percolation of MPPO treatment, MJPO, TMPO, MPPK, MJPK and Show at startup consecutively: 16.88; 21.74; 30.38; 17.03; 23.39 and 24.34 mm for Run-off N and 133.76; 128.89; 120.26; 133.60; 127.24 and 126.30 mm for Run-off P. Nutrient dynamics represented by Run-off/percolation and plant nutrient uptake. Run-off/percolation on equal treatment consecutively 320,29; 3113,63; 327,84; 296,15; 342,60 and 299,80 kg/ha of N and 950,01; 953,44; 940,56; 894,95; 849,23; and 895,79 kg/ha for P. Uptake N plants in the same treatment consecutively 103,5; 110,16; 95,95; 128,86; 82,40 dan 125,20 kg/ha and P plant nutrient uptake respectively are 37,6; 33,64; 46,52; 45,34; 91,05 dan 44,50 kg/ha. The combination of plastic mulch with chemical fertilizer was most effective in maintaining water and nutrients dynamics among others.