

## RINGKASAN

Unsur Fosfor (P) merupakan hara makro esensial yang memegang peranan penting dalam berbagai proses, seperti fotosintesis, asimilasi, dan respirasi. Peran penting yang dimiliki oleh unsur P pada tanaman menyebabkan unsur ini harus selalu tersedia pada saat penanaman padi. Penelitian ini bertujuan untuk mengetahui ketersediaan P di lahan sawah DAS Serayu Kecamatan Klampok Kabupaten Banjarnegara dan mengetahui hubungan P-tersedia dan P-serapan dengan hasil tanaman padi di DAS Serayu Kecamatan Klampok Kabupaten Banjarnegara.

Penelitian dilaksanakan pada bulan Februari sampai dengan September 2023. Metode penelitian yang digunakan adalah survei lapangan secara *purposive random sampling*. Penentuan titik lokasi pengamatan menggunakan sistem transek, pada peta Satuan Lahan Homogen (SLH) disusun melalui *overlay* peta penggunaan lahan sawah, peta jenis tanah dan peta kelerengan. Pengambilan sampel tanah dilakukan dengan pengeboran tanah pada kedalaman 0-25 cm dan 25-50 cm yang dilakukan secara *random* pada setiap lokasi pengamatan, pengambilan sampel tanah dilakukan secara komposit pada setiap lapisan tanah. Pengambilan sampel jaringan tanaman diambil dari 6 tanaman, pada setiap tanaman diambil 2 daun dari daun ke 3, sehingga diperoleh 12 daun pada setiap lokasi. Variabel yang diamati adalah pH H<sub>2</sub>O, pH KCl, Daya Hantar Listrik (DHL) tanah, potensial redoks, P-tersedia, Serapan P tanaman, dan hasil tanaman padi.

Hasil penelitian menunjukkan bahwa sebaran unsur hara Fosfor (P) pada lahan sawah pertanaman padi di DAS Serayu Kecamatan Klampok Kabupaten Banjarnegara dilokasi penelitian berkisar 21,5 – 201,2 ppm P<sub>2</sub>O<sub>5</sub> yang berharkat rendah hingga sangat tinggi. Hubungan korelasi antara P-tersedia dengan hasil tanaman padi di Kecamatan Klampok Kabupaten Banjarnegara pada kedalaman 0-25 memiliki hubungan korelasi positif dengan nilai  $R^2 = 0,415$  (harkat korelasi sedang), sedangkan pada kedalaman 25-50cm memiliki korelasi positif dengan nilai  $R^2 = 0,083$  (harkat korelasi sangat lemah). Hubungan korelasi antara P tersedia dengan P-serapan memiliki korelasi positif kuat pada kedalaman 0-25 cm dengan nilai  $R^2 = 0,785^{**}$  (harkat korelasi kuat) sedangkan pada kedalama 25-50 cm memiliki hubungan korelasi kuat dengan nilai  $R^2 = 0,785^*$  (harkat korelasi kuat).

Kata Kunci : Fosfor, Fosfor tersedia, Serapan Fosfor, Tanaman Padi, DAS Serayu

## SUMMARY

*The Phosphorus (P) is an essential macronutrient that plays an important role in various processes, such as photosynthesis, assimilation, and respiration. The important role played by the element P in plants causes this element to always be available during rice planting. This study aims to determine the availability of P in the rice fields of Serayu Watershed Klampok District Banjarnegara Regency and determine the relationship of P-availability and P-absorption with rice yield in Serayu Watershed Klampok District Banjarnegara Regency.*

*The research was conducted from February to September 2023. The research method used was purposive random sampling field survey. Determination of observation location points using a transect system, on a Homogeneous Land Unit (SLH) map prepared through overlaying a map of rice field land use, soil type map and slope map. Soil sampling is done by drilling the soil at a depth of 0-25 cm and 25-50 cm which is done randomly at each observation location, soil sampling is done compositely in each soil layer. Plant tissue sampling was taken from 6 plants, on each plant 2 leaves were taken from the 3rd leaf, so that 12 leaves were obtained at each location. Variables observed were pH H<sub>2</sub>O, pH KCl, soil conductivity, redox potential, P-availability, plant P uptake, and rice yield.*

*The results showed that the distribution of Phosphorus (P) nutrients in rice paddy fields in the Serayu River, Klampok District, Banjarnegara Regency at the research site ranged from 21.5 - 201.2 ppm P<sub>2</sub>O<sub>5</sub> which has a low to very high value status. The correlation relationship between P-available with the yield of rice plants in Klampok District, Banjarnegara Regency at a depth of 0-25 has a positive correlation relationship with a value of  $R^2 = 0.415$  (moderate correlation status), while at a depth of 25-50cm has a positive correlation with a value of  $R^2 = 0.083$  (very weak correlation status). The correlation between available P and P-absorption has a positive correlation at a depth of 0-25 cm with a value of  $R^2 = 0.785^{**}$  (strong correlation status) while at a depth of 25-50 cm has a strong correlation relationship with a value of  $R^2 = 0.785^*$  (strong correlation status).*

*Keywords: Phosphorus, available phosphorus, phosphorus uptake, rice plants, Serayu river*