

## Intisari

Kualitas tanah dan ketersediaan air di dalam tanah merupakan faktor penting yang dapat mempengaruhi pertumbuhan dan perkembangan tanaman. Tanah yang dapat menahan air dalam jangka waktu yang lama dapat mendukung pertumbuhan tanaman. Penelitian ini bertujuan untuk mengetahui perbedaan retensi air tanah pada sistem olah tanah konservasi dan sistem olah tanah konvensional serta untuk mengevaluasi sistem pengolahan tanah yang efektif dalam menahan air di dalam tanah dengan pendekatan indeks kualitas tanah. Penelitian dilakukan dengan mengumpulkan data analisis sifat fisik dan kimia tanah yang meliputi tekstur, Berat Volume (BV), Berat Jenis (BJ), porositas tanah, pori drainase cepat, pori drainase lambat, air tersedia, distribusi sebaran pori dan C-organik tanah pada lahan olah tanah konservasi dan olah tanah konvensional. Hasil penelitian menunjukkan terdapat perbedaan sifat fisik dan hidrologis pada kedua jenis pengolahan tanah yang dikaji. Perbedaan sifat fisik tanah mampu mempengaruhi kemampuan tanah dalam menahan air, terutama pada sifat fisik berat volume, porositas total dan kandungan bahan organik. Sistem olah tanah konvensional dapat mengurangi kandungan bahan organik tanah daripada pengolahan tanah konservasi. Kecenderungan serupa juga ditemukan untuk karakteristik retensi air. Kadar air kapasitas lapangan, kadar air titik layu permanen dan kadar air tersedia pada olah tanah konvensional relatif lebih rendah daripada olah tanah konservasi. Hasil pengamatan menyatakan bahwa secara relatif rendahnya kadar air pada olah tanah konvensional karena adanya pengolahan yang intensif dimana pengolahan tanah intensif mampu menyebabkan degradasi lahan.

Kata kunci: retensi air tanah, pengolahan tanah, distribusi pori

## **Abstract**

Soil quality and the availability of water in the soil are important factors that can affect plant growth and development. Soil that can hold water for a long time can support plant growth. This study aims to determine the water retention properties of conservation tillage systems and conventional tillage systems as well as to evaluate effective tillage systems in retaining water in the soil with a soil quality index approach. The study was conducted by collecting data on the analysis of the physical and chemical properties of the soil, which included texture, Bulk Density (BD), Bulk Particle (BP), soil porosity, fast pore drainage, slow pore drainage, available water pore, pore distribution, and soil organic C on conservation tillage and conventional tillage. The results showed that there were differences in the physical and hydrological properties of the two types of tillage studied. Differences in the soil's physical properties, especially its, bulk density, soil porosity and organic matter content, can affect the soil's ability to hold water. Conventional tillage systems can reduce soil organic matter content rather than conservation tillage. A similar trend was also found for water retention characteristics. Field capacity moisture content, permanent wilting point moisture content, and available water content in conventional tillage are relatively lower rather than conservation tillage. Observations show that the relatively low water content in conventional tillage is due to intensive tillage, where intensive tillage can cause land degradation.

**Keyword:** soil water retention, soil tillage, pore distribution