

## INTISARI

Penelitian ini bertujuan mengetahui perbedaan komposisi fraksi mineral primer dan jenis mineral sekunder tanah sawah organik dan konvensional dan mengetahui pengaruh pengelolaan tanah secara organik dan konvensional terhadap fraksi karbon setiap lapisan tanah. Lokasi penelitian berada di Imogiri dan Berbah. Sampel tanah yang di ambil tiap horizon yang telah dideskripsikan. Jenis dan komposisi mineral primer dapat ditentukan dengan metode sayatan tipis menggunakan mikroskop polarisasi dan analisis *x-ray diffraction* digunakan untuk menentukan jenis mineral sekunder. Hasil penelitian menunjukkan jenis mineral primer tanah sawah organik dan konvensional di Imogiri dan Berbah yaitu mineral tahan lapuk (mineral opak dan kuarsa) dan mineral mudah lapuk (piroksen, horblende dan plagioklas andesin). Tanah sawah organik dan konvensional di Imogiri dan Berbah mempunyai cadangan unsur hara yang rendah karena sedikit mengandung mineral mudah lapuk. Jenis mineral haloisit terdapat pada tanah sawah organik di Imogiri dan tanah sawah organik dan konvensional di Berbah dan tanah sawah konvensional di Imogiri mengandung mineral metahaloisit dan montmorillonit. Hasil analisis sifat fisika tanah yaitu berat volume pada tanah sawah organik di Imogiri dan Berbah lebih rendah dibandingkan dengan tanah sawah konvensional karena adanya penambahan bahan organik dan kandungan lempung. Pemberian bahan organik ke dalam tanah dapat meningkatkan kandungan fraksi karbon di dalam tanah yaitu C-POM (*C-particulate organic matter*), C-BMT (C-biomassa mikroorganisme tanah), C-termineralisasi, asam humat dan asam fulvat tanah. Hasil penelitian juga menunjukkan dengan sistem pertanian organik dapat memperbaiki sifat kimia tanah yang meliputi C-organik, KPK, N-total.

Kata kunci: mineral, analisis sayatan tipis, x-ray, fraksi karbon, pertanian organik.

## ABSTRACT

The objective of the study was to know composition of primary and secondary minerals of paddy soils and observe the influence of organic and conventional management system of soils on soil carbon distribution. The location of the study in Imogiri and Berbah. Soil sampling was taken from each soil layers. Type and composition of primary minerals can be determined by thin sections using an optical microscope and x-ray diffraction can be used to determine secondary minerals. The results showed that resistant minerals (opaque and quartz) and weatherable minerals (piroksen, horblende and plagioclase andesin) has been found in organic and conventional paddy soil in Imogiri and Berbah. The organic and conventional paddy soils in Imogiri and Berbah have low nutrients reserves. It is caused paddy soils contain low weatherable minerals (piroksen, horblende and plagioclase andesin). Halloysite has been found in organic paddy soil in Imogiri and organic paddy soil and conventional in Berbah. Conventional paddy soil in Imogiri contains metahalloysite and montmorillonite. The result of analysis of soil physics properties that bulk density of organic paddy soil in Imogiri and Berbah is lower than conventional due to the addition of organic matters and clay content. Application of organic farming systems was able to increase carbon fractions content in soils, which can be seen from increase on the quantity of C-POM (*C-particulate organic matter*), C-SMB (*C-soil microorganisms biomass*) and C-mineralized, humic and fulvic acid. This study also indicated that organic farming system can improve soil chemical properties, i.e: C-organic, Cation Exchange Capacity, and total nitrogen.

Keywords: minerals, thin sections, x-ray, carbon fraction, organic farming.