

**EVALUASI PENGGUNAAN PUPUK DAN PESTISIDA KIMIA  
TERHADAP PRODUKTIVITAS TANAMAN KUBIS  
(*Brassica oleracea* L.) DI KABUPATEN MAGELANG  
INTISARI**

Oleh :

**AHMAD SODIKIN**  
**21/479113/TP/13217**

Produktivitas tanaman kubis merupakan indikator penting dalam menilai keberhasilan budidaya, yang dipengaruhi oleh berbagai faktor eksternal seperti sifat fisika-kimia tanah dan residu pestisida. Penelitian ini bertujuan untuk mengevaluasi pengaruh dan korelasi sifat fisika dan kimia tanah serta kandungan residu pestisida terhadap produktivitas tanaman kubis di lima desa di Kabupaten Magelang, Jawa Tengah. Data kuantitatif diperoleh dari lapangan yang kemudian diuji di laboratorium dan dianalisis secara menggunakan *software Structural Equation Modeling–Partial Least Squares* (SEM-PLS) untuk mengetahui pengaruh antar variabel serta *Statistical Package for the Social Sciences* (SPSS) untuk mengetahui nilai korelasi antar variabel. Pengukuran SEM-PLS dilakukan dengan menggunakan metode koefisien jalur path.

Hasil penelitian menunjukkan bahwa Kadar Lengas (KL), Berat Volume ( $\rho_b$ ), dan residu pestisida *Cypermethrin* berpengaruh negatif terhadap produktivitas, sedangkan Berat Jenis ( $\rho_s$ ), Porositas (N), pH tanah, C-organik (CO), dan N-total (N-tot) menunjukkan pengaruh positif. Di antara semua variabel, C-organik ( $p = 1,211$ ) dan N-total ( $p = 0,931$ ) memberikan pengaruh paling signifikan terhadap produktivitas. Residu *Methidation* menunjukkan korelasi positif ( $p = 0,670$ ). Sedangkan pengukuran korelasi dilakukan dengan metode regresi linear berganda dan diperoleh persamaan:  $PRD = -23.085 - 0.352(KL) - 1.047(BV) + 4.533(BJ) + 0.668(P) + 0.360(pH) + 6.350(Co) + 37.387(Ntot)$ . Dari lima lokasi penelitian, hanya dua lahan yang melampaui target produktivitas nasional. Temuan ini menekankan pentingnya pengelolaan tanah dan pengendalian residu pestisida untuk mendukung produktivitas dan keberlanjutan pertanian.

**Kata Kunci** : Sifat tanah, Residu Pestisida, Produktivitas, *Brassica oleracea* (Kubis), SEM-PLS, Magelang.

## EVALUATION OF CHEMICAL FERTILIZER AND PESTICIDE USE ON THE PRODUCTIVITY OF CABBAGE (*Brassicca oleracea* L.) IN MAGELANG REGENCY

### ABSTRACT

By:

**AHMAD SODIKIN**  
**21/479113/TP/13217**

Cabbage crop productivity is a key indicator for assessing the success of cultivation, which is influenced by various external factors such as the physical-chemical properties of soil and pesticide residues. This study aims to evaluate the influence and correlation of soil physical and chemical properties as well as pesticide residue content on the productivity of cabbage plants in five villages in Magelang Regency, Central Java. Quantitative data were collected from the field, tested in laboratories, and then analyzed using Structural Equation Modeling–Partial Least Squares (SEM-PLS) to determine the effects between variables, and the Statistical Package for the Social Sciences (SPSS) to assess the correlation values among variables. SEM-PLS measurements were carried out using the path coefficient method.

The results of the study showed that Soil Moisture Content (KL), Bulk Density ( $\rho_b$ ), and Cypermethrin pesticide residues had a negative effect on productivity, while Particle Density ( $\rho_s$ ), Porosity (N), Soil pH, Organic Carbon (CO), and Total Nitrogen (N-tot) showed a positive effect. Among all variables, Organic Carbon ( $p = 1.211$ ) and Total Nitrogen ( $p = 0.931$ ) had the most significant influence on productivity. Methidation residue showed a positive correlation ( $p = 0.670$ ). Correlation measurements were conducted using multiple linear regression, resulting in the equation:  $PRD = -23.085 - 0.352(KL) - 1.047(BV) + 4.533(BJ) + 0.668(P) + 0.360(pH) + 6.350(Co) + 37.387(Ntot)$ . Of the five study sites, only two fields exceeded the national productivity target. These findings highlight the importance of soil management and pesticide residue control to support agricultural productivity and sustainability.

**Keywords:** Soil properties, Pesticide residues, Productivity, Cabbage, Structural Equation Modeling - Partial Least Squares (SEM-PLS), Magelang.