

## RINGKASAN

Timbal (Pb) dan kadmium (Cd) merupakan logam berat yang dapat mencemari lahan pertanian dan dapat membahayakan kesehatan manusia apabila dikonsumsi. Penelitian yang telah dilaksanakan bertujuan untuk mengetahui kandungan logam berat timbal dan kadmium pada tanah lahan sawah dan beras dengan sistem pertanian konvensional dan sistem pertanian organik.

Penelitian dilaksanakan dari April hingga September 2023. Penelitian dilaksanakan dengan pendekatan survei *purposive random sampling*. Berdasarkan kriteria yang telah ditentukan, diambil masing-masing tiga sampel tanah dan beras dari lahan pertanian organik dan konvensional di Kabupaten Cilacap dan Banyumas dengan jumlah 12 sampel. Responden petani diambil sebanyak 6 petani organik dan 6 petani konvensional. Sampel tanah diambil pada kedalaman 10-20 cm dari 5 titik *sampling* kemudian dikumpulkan menjadi sampel komposit. Variabel penelitian antara lain pH tanah, C-Organik, kapasitas tukar kation, serta kandungan timbal dan kadmium pada sampel tanah dan beras.

Hasil penelitian menunjukkan bahwa kandungan timbal pada sampel tanah lahan sawah organik dan konvensional di Kabupaten Cilacap dan Banyumas berkisar antara 0,80-1,80 ppm, dan kadmium berkisar antara 0,070-0,172 ppm. Berdasarkan standar baku PP No. 101 Tahun 2014 kandungan timbal dan kadmium pada sampel tanah organik dan konvensional tidak melewati ambang batas minimum. Kandungan timbal dan kadmium pada sampel beras lahan sawah konvensional di Kabupaten Cilacap dan Banyumas berkisar antara 0,52-1,11 ppm dan 0,008-0,043 ppm. Berdasarkan standar baku SNI (2009), kandungan timbal pada sampel beras organik dan konvensional berada di atas ambang batas minimum dan kandungan kadmium pada sampel beras organik dan konvensional berada di bawah ambang batas minimum. Hasil wawancara petani menunjukkan praktik budidaya padi konvensional menggunakan pupuk kimia dan pestisida sintetik, serta umumnya petani tidak menggunakan pupuk organik padat pada pengolahan lahan sawah. Praktik budidaya padi organik menggunakan pupuk organik serta pestisida organik. Pupuk organik dan pestisida organik yang digunakan umumnya merupakan pupuk dan pestisida organik yang dibuat sendiri, berupa pupuk organik padat dan cair, IMO, ecoenzym, dan lain-lain. Hasil uji *independent sample T test* antara kandungan timbal dan kadmium pada lahan sawah organik dan konvensional tidak terdapat perbedaan yang nyata antara kandungan logam berat timbal dan kadmium pada tanah dan beras di lahan sawah organik dan konvensional.

## SUMMARY

*Lead (Pb) and cadmium (Cd) are heavy metals that can pollute agricultural land and can endanger human health if consumed. The research that has been carried out aims to determine the content of heavy metals lead and cadmium in the soil of paddy fields and rice fields using conventional farming systems and organic farming systems.*

*The research was carried out from April to September 2023. The research was carried out using a purposive random sampling survey approach. Based on predetermined criteria, three samples of soil and rice were taken each from organic and conventional agricultural land in Cilacap and Banyumas Regencies with a total of 12 samples. The farmer respondents were 6 organic farmers and 6 conventional farmers. Soil samples were taken at a depth of 10-20 cm from 5 sampling points and then collected into a composite sample. Research variables include soil pH, C-Organic, cation exchange capacity, and lead and cadmium content in soil and rice samples.*

*The research results showed that the lead content in soil samples from organic and conventional rice fields in Cilacap and Banyumas Regencies ranged from 0.80-1.80 ppm, and cadmium ranged from 0.070-0.172 ppm. Based on the standard PP No. 101 of 2014, the lead and cadmium content in organic and conventional soil samples does not exceed the minimum threshold. The lead and cadmium content in conventional rice samples from paddy fields in Cilacap and Banyumas Regencies ranged between 0.52-1.11 ppm and 0.008-0.043 ppm. Based on SNI standards (2009), the lead content in organic and conventional rice samples is above the minimum threshold and the cadmium content in organic and conventional rice samples is below the minimum threshold. The results of farmer interviews show that conventional rice cultivation practices use chemical fertilizers and synthetic pesticides, and generally farmers do not use solid organic fertilizer in processing rice fields. In organic rice cultivation practices, the fertilizers used are organic fertilizers and organic pesticides. The organic fertilizers and organic pesticides used are generally self-made organic fertilizers and pesticides, in the form of solid and liquid organic fertilizers, IMO, coenzymes, etc. The results of the independent sample T test between lead and cadmium content in organic and conventional rice fields showed no significant difference between the heavy metal content of lead and cadmium in soil and rice in organic and conventional rice fields.*