

ABSTRACT

Ultrasonic testing is a method of NDT (Non-Destructive Testing) that utilizes ultrasonic waves to detect the thickness of an object. Ultrasonic testing method can use to determine the contours of the fertile soil layer by emitting ultrasonic waves through the transducer to the surface of the test object. The reflected wave response that seen at the oscilloscope is analyzed to see how long time the wave transmitted until received. In this research, be used a single transducer AT200 that has a working frequency of 200kHz. Before experimenting, previously do characterize of the test object to determine the velocity of wave propagation in each object. Based on the time and velocity of ultrasonic waves, the thickness of the fertile soil layer can be determined which serves as data in making the contour of the fertile soil layer. To display the contours of the fertile soil layer in three dimensions, the x-axis and y-axis will be assumed to be the coordinates of the measurement point and the z-axis is assumed to be the thickness of the humus soil. From the experiment that has been carried out, it is found that the measurement of the thickness of the soil layer detected has an average error rate of 1.009% in humus soil and 0.878% in laterite soil. Based on these results, it is concluded that the ultrasonic testing method can be applied to determine the contours of the fertile soil layer.

Keywords: The contour fertile layer of soil, NDT (Non-Destructive Testing), Ultrasonic Testing Method.