ADHESI TANAH – METAL PADA BERBAGAI TINGKAT PERUBAHAN KEPADATAN DAN KADAR AIR TANAH

(Soil – Metal Adhesion Due To the Variation of Soil Compactness and The Soil Moisture Content)

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Abstract

Soil, as the nature body, is very important in supporting the live perpetuity of the living creatures. In farm machinery and equipment application for soil tilling, soil also affects the goal of the soil tillage activities.

When the soil tillage equipment and machinery are to be applied in the field, there will be interaction among the traction device, the blade, and the soil. The soil, which is used as a machine supporter, must have a certain consistency. Consistency is the degree of cohesion and adhesion among soil particles and soil mass resistance to the variation of shape by pressure and strength that affected the soil deformation.

The objective of the research was to study the soil – metal adhesion due to the variation of soil compactness and the soil moisture content.

Results of the research showed that soil - metal adhesion increased by the increasing of soil moisture content from 39.3% to 82.2 %, but it decreased by the increasing of soil compactness from 0.47 g/cc to 0.95 g/cc. THe soil-metal adhesion decreased and decreased again by the increasing of the soil moisture content until it reached a very wet or saturated conditions of the soil.

Soil strength was much more affected by the soil - metal adhesion than by the soil-metal friction. Friction phase, adhesion phase, and lubrication phase occurred when the soil moisture content reached ≤ 40.8 %, 40.8 – 82.2 %, and ≥ 82.2 % respectively. The adhesion showed a high value when the soil moisture content reached the adhesion phase.

Keywords : adhesion, friction, soil compactness, and soil moisture content

PENDAHULUAN

Tanah, sebagai tubuh alam, sangat berperan dalam menopang kelangsungan hidup makhluk hidup. Di bidang budidaya pertanian, tanah amat berperanan dalam hal penyediaan unsur hara dan sebagai tempat tumbuhnya tanaman, dimana dikehendaki tanah mempunyai struktur remah atau kondisi gembur agar tanaman dapat tumbuh dengan baik. Di bidang teknik sipil pertanian, kekuatan tanah menjadi penentu keberhasilan pembangunan konstruksi suatu bangunan karena tanah dipandang sebagai tempat berdiri tegaknya suatu bangunan.

Dalam penerapan alat dan mesin pertanian untuk mengolah tanah maka tanah juga menjadi penentu berhasil tidaknya kegiatan pengolahan tanah. Untuk dapat menerapkan alat dan mesin pengolah tanah maka harus diketahui berapa sebenarnya gaya-gaya reaksi tanah pada saat alat dan

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