

Development of Automatic Farm Manure Spreading Machine for Orchards

Authors : Barış Ozluoymak, Emin Guzel, Ahmet İnce

Abstract : Since chemical fertilizers are used for meeting the deficiency of plant nutrients, its many harmful effects are not taken into consideration for the structure of the earth. These fertilizers are hampering the work of the organisms in the soil immediately after thrown to the ground. This interference is first started with a change of the soil pH and micro organismic balance is disrupted by reaction in the soil. Since there can be no fragmentation of plant residues, organic matter in the soil will be increasingly impoverished in the absence of micro organismic living. Biological activity reduction brings about a deterioration of the soil structure. If the chemical fertilization continues intensively, soils will get worse every year; plant growth will slow down and stop due to the intensity of chemical fertilizers, yield decline will be experienced and farmer will not receive an adequate return on his investment. In this research, a prototype of automatic farm manure spreading machine for orange orchards that not just manufactured in Turkey was designed, constructed, tested and eliminate the human drudgery involved in spreading of farm manure in the field. The machine comprised several components as a 5 m³ volume hopper, automatic controlled hydraulically driven chain conveyor device and side delivery conveyor belts. To spread the solid farm manure automatically, the machine was equipped with an electronic control system. The hopper and side delivery conveyor designs fitted between orange orchard tree row spacing. Test results showed that the control system has significant effects on reduction in the amount of unnecessary solid farm manure use and avoiding inefficient manual labor.

Keywords : automatic control system, conveyor belt application, orchard, solid farm manure

Conference Title : ICAE 2017 : International Conference on Agricultural Engineering

Conference Location : Lisbon, Portugal

Conference Dates : April 16-17, 2017