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UDC: 629.366.014.2.07

**Tractive performance comparasions of radial-ply and bias-ply agricultural tractor drive tires**

*Agr. Engng 10* (2005) 1-2, 01-08; 7 fig., 14 ref.

Tractive performance of tractor drive tires has been a challenging problem for many engineers. The complex nature of soil-tire interaction and the lack of any closed form mathematical description of the phenomena have driven researchers to study this area experimentally for decades. In this study, the tractive performances of the same size but different constructions of tractor drive tires were investigated and it is believed that these experimental studies will enhance the knowledge of soil-tire interactions under different soil conditions and tire operating variables. For this purpose, tractive performance data were collected in the soil bins at the National Soil Dynamics Laboratory, Auburn, Alabama. Two tires, an 18.4R38 radial-ply and an 18.4-38 bias-ply tire were used during the tests in order to find the differences in their tractive performances in sandy loam soil. Three levels of travel reduction (7.5, 15 and 25%) and inflation pressure (83, 97 and 110 kPa) were chosen and dynamic load on tire was ramped up during the tests. From the study it was found that the radial-ply tire had greater tractive efficiency at all combinations of inflation pressure and travel reduction except the one at 97 kPa inflation pressure and 25 % travel reduction.

L. Savin, R. Nikolić, T. Furman, M. Tomić R. Gligorić, M. Simikić .

UDC:631.372

**The analysis of influential parameters on optimal structure of the machinery pool in agriculture**

*Agr. Engng 10* (2005) 1-2, 08-15; 5 fig., 2 tab, 4 ref.

Structure of machinery pool is influenced by following: seeding structure, soil condition, conception and category of tractors, plot length and size of estate. The analysis conducted within this investigation, gave following output: required number of tractors per hectare (tractors/ha), fuel consumption per hectare (l/ha), work-hours input per hectare (h/ha) and total exploitation costs per hectare (din/ha). The seeding structure has influence on the required number of tractors, fuel consumption, work-hours and exploitation costs of agricultural machinery. An increase in specific soil resistance and size of estate influence larger number of tractors, higher fuel consumption, higher work-hours input and higher total exploitation costs. However, the increase of plot length influences these very parameters to decrease.

N. Đukić , A. Sedlar .

UDC: 631.348

**Twinfluid sprayers, protections of plants and environment**

*Agr. Engng 10* (2005) 1-2, 16-22; 5 fig., 5 ref.

Application of twinfluid sprayers in plant protection enables better treatment of plants and by that also a more efficient protection. Separate effect in relation to application of classical sprayers is decrease of drift by which the contamination of the environment is lowered, without taking away the drops out of protected object which presents a controlled application.

A. Degirmencioglu , H. Yurdem .

UDC: 631.67:63T.1/8

**Development of a simple and low cost-automatic watering device for vegetable transplanters**

*Agr. Engng* 10 (2005) 1-2, 23-30; 5 fig., 5 ref.

A study was conducted with an objective of developing an automatic watering device that is simple in construction, easily applicable on existing transplanters and economically feasible for many local manufacturers. In order to meet this objective, an automatic watering device was developed and tested in both the laboratory and field. The developed automatic watering device consists of a micro switch for the detection of seedlings, a water reservoir, an arm, an actuator, and an electronic circuit. All of these components were used to release a predetermined amount of water while bringing water and seedling together with a good synchronization at the target location. According to the tests carried out in the laboratory and field, it was found that the developed device provides a 33.6 % water saving at a seedling spacing of 30 cm and 50 and 60% at seedling spacings of 40 and 50 cm, respectively.

A. Dimitrijević , M. Đević

UDC:631.344.5

**The computer control of greenhouse production processes**

*Agr. Engng* 10 (2005) 1-2, 31-38; 6 fig., 15 ref.

Greenhouse production is the most energy consuming branch in agriculture. Production processes control in accordance with random-dynamic greenhouse environment, results with high cost of complex operations and energy input. For well-done production results realization with high level of energy efficient, precise control of environment and production processes should be applied. This paper presents an overview of possibilities and importance of a well done system control. Particular attention is paid on the types of control equipment and their correct installation. There are given the most important attributes for fulfilled and reliable system control. The control levels and the possibilities of irrigation and nutrition processes control, as the great importance operation procedures in plant production, are separately presented.

Martinov M, Tešić M, Brkić M.

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**Solid biomass as renewable energy source**

*Agr. Engng* 10 (2005) 1-2, 39-47; 6 fig., 13 ref.

The study has been provided to evaluate possibilities of solid biomass – crop residues use as energy source in community in agricultural area in Pannonia plane. The energy needs and biomass potentials have been elaborated separately for stock holding company having 14,000 ha and private farmers. The energy needs for household heating, heating of company rooms and drying have been assessed. It has been found that biomass of private farmers can cover about 37% of total energy need for household heating in the community. This is approximately 244 TJ/a, while the potential of the available biomass is 312 TJ/a. Almost the same share of heating and drying energy needs in the company can be covered using biomass, 40%. This will be covered using approximately 2,390 t/a of available 5,950 t/a. Economy of biomass use as a fuel has been provided for one 400 kW facility that should be used for heating of administration room, laboratory and central workshop of company. The price of effective energy of biomass is considerably lower than that of natural gas, but facility – boiler with equipment – costs much more for biomass. Final energy price is lower for biomass, but not considerably. The other indirect economic and non economic influences have been considered and commented. It was concluded that implementation of biomass as energy source can contribute to the development of rural area. However, proper development requires support of the whole society. Implementation of biomass has economic, environmental and societal effects.