Agrotechnol 2015, 4:2
http://dx.doi.org/10.4172/2168-9881.S1.016

OMICS International
conferenceseries.com

4th International Conference on Agriculture & Horticulture

July 13-15, 2015 Beijing, China

Discrete element modeling of soil loosening by a ripper

Ying Chen and Bo Li
University of Manitoba, Canada

Soil loosening is a very important performance indicator forsub-soiling tools. In this study, soil loosening effects from a ripper (a sub-soiling tool) was investigated through numerical modeling. To assist the model development, tests of the ripper were performed in a field with a clay soil texture. In the tests, the ripper was operated at a tillage depth of 300 mm and travel speed of 3 km/h. Before testing, soil cone indices of the undisturbed field were measured using a cone penetrometer; after testing, soil cone indices of the disturbed soil resulting from the ripper passage were measured. A soil-ripper model was developed to simulate the field operation of the ripperand its interaction with soil using the discrete element method (DEM). The model was able to predict soil swell factor which is commonly used to evaluate the extent of soil loosening by a tillage tool. The model ripper was 1:1 scale representation of ripper used in the field tests, and the spherical model soil particles had diameters varying from 3 to 30 mm. The soil-ripper model was calibrated and validated through comparing soil cone indices measured in the field and thoseobtained through virtual penetration tests performed to the assembly of the model particles. The validated soil-ripper model was used to further investigate soil swell factor as affected by the ripper working depths under differentinitial soil porosities.

ying_chen@umanitoba.ca

Recent situation of the small fruit industry in Poland

Stanislaw Pluta
Research Institute of Horticulture, Poland

In Poland, strawberry, blackcurrant, raspberry, gooseberry and blueberry are important small fruit crops which are grown on commercial plantations as well as in home gardens. Poland has been one of the biggest producers and exporters of fresh and processed small fruits in Europe and globally for many years. According to official data, the annual domestic fruit production of strawberries ranges between 147 000 and 197 000 Metric tons (MT) in recent years. This fruit is destined mainly for processing (70-80%) and new cultivation methods have been developed to produce dessert strawberries for the fresh market. Blackcurrant production is from 124 000 to 146 000 MT and fruits are used for processing and freezing. The modern technology of cultivation, maintenance of plantation and machine harvesting of fruit are all commonly used by our growers. Raspberry cultivation has recently increased from 87 000 to 128 000 MT due to new polish cultivars and the profitable prices offered for growers. The majority of fruit are processed and frozen with only 5-10% used for the fresh market. The floricane (30%) and primocane (70%) cultivars are grown mainly in open fields rather than under tunnels. The gooseberry harvest has been very stable in recent yearsand ranges from 14 000 to 17 000 MT. Its production has generally followed a decreasing trend due to the limited number of valuable cultivars. Fruits are machine harvested and are mainly processed with only 1-2% (handpicked) of production destined for the fresh market. Blueberries have actually shown an increased trend in the acreage and fruit production. The annual production is between 12 000 and 17 000 MT and fruits are only used for fresh market especially for the export to UK (80%).

Stanislaw.Pluta@inhort.pl