УДК 631.3

EXPLORATION OF THE CURRENT STATUS OF RESEARCH ON TIGERNUT SEEDERS IN CHINA

马世宽（Ma Shikuan）,刘知鑫（Liu Zhixin）
王春清（Wang chunqing）,翟玉彬（Zhai Yubin）
青岛农业大学（Qingdao Agricultural University）
e-mail: 827993666@qq.com

Summary. *Domestic tigernut mechanised seeding is currently in the beginning of the rapid development stage, part of the region in the reference to the original agricultural mechanisation of high-end technology on the basis of research and development were applied to the characteristics of the region relatively mature tigernut seeding machinery, but due to the regional differences are large, the related equipment is not a strong wide range of applicability.*

From the basic situation in China, these seed displacing implements have a clear structure, and they can be defined and divided into categories according to the differences in structure. According to the actual needs of planting vegetables in greenhouses, Jiang Enchen and other researchers have developed and designed hand-push seeders, which have improved the efficiency and quality of seeding to different degrees. For this kind of machine, its size is not big, the basic structure is not complicated, and the environmental adaptability is strong. Yu Zhenjun and others have carried out research and development and design of the eyelet-type barrel-type seed discharge groove wheel in order to solve the problems faced by the cabbage in the process of sowing. With the passage of time, the advanced science and technology also continues to achieve innovation and upgrading, more perfect performance of pneumatic seed discharger was introduced into our country, the domestic pneumatic precision seed discharger in the process of development has gained a huge impetus, more specialised seed discharger was developed and designed, and has been practically applied.

In addition, Hu Shurong et al. carried out a theoretical study on seed dischargers with the help of the basic principles of hydrodynamics. Wu Futong and others, in the process of research and development of seed discharger design, the organic combination of air suction and air blowing, and with the help of orthogonal test on the impact of the seed discharge quality of the indicators to carry out a comprehensive analysis of the optimal operating parameters to make a decision.

At present, pneumatic seed dischargers are more often used in the sowing of field crops. Mechanical precision seed discharger has a simpler structure, low manufacturing cost, and is more widely used in China. At the same time, this kind of seed discharger also has certain shortcomings, for example, the shape of the seed is not ideal, in the single seed sowing, the effect is relatively poor, but also not conducive to the protection of the seed, and the rate of leakage is also

relatively high. In summary, in this case, the mechanical seed dispenser needs to be further improved and optimised, so that its performance can be comprehensively improved to better meet the actual needs of the sowing work.

УДК 631.3

EDEM SIMULATION ANALYSIS OF JAMMED SPECIAL HOLE PUNCHED ROW TUPE TIGERNUT SEEDER

马世宽（Ma Shikuan），刘知鑫（Liu Zhixin），尚书旗（Shang Shuqi）

青岛农业大学（Qingdao Agricultural University）

e-mail: 827993666@qq.com

Summary. *Through the use of EDEM simulation software, the establishment of the tigernut particle model and the card position special hole punch row tigernut precision seeder model, simulation analysis, to verify the seeding performance of the seeder.*

Simulate the seed guiding tube and the seed filling, guiding and conveying involved in the process of seed sowing from the seed dispenser to the ground. On the basis of determining the material properties of tigernut and obtaining relevant information and data support, the corresponding particle model is established and the relevant boundary parameters are set. Through the establishment of the particle model of oil soybean seeds, the 3D model of the oil soybean seed distributor, which was saved as a STEP file format at a scale of 1:1, was imported into the EDEM discrete element simulation software.

Figure 1 – Discrete element model diagram of tigernut

Figure 2 – Olea europaea in arc segment diagrams

According to the actual field operation situation and the agronomic sowing technical requirements of tigernut, the speed of the seeder was set to 3 km/h, the rotational speed of the seed dispenser was set to 20 r/min, and the tangent inclination angle of the seed-guiding cylinder curve was set to 75º, so as to analyse the movement state of tigernut seeds in the seed-guiding process. The total simulation time was set to 25 s.

Figure 3 – Seeding process diagram