

Main Achievements of the Mechanized Maize Production Team College of Engineering, China Agricultural University

1. Stripping mechanism of maize ear snapping

A stripping mechanism of maize ear snapping has been designed, a prototype has been manufactured, and field test has been conducted to solve the problem of existing maize head that row spacing could not be adjusted according to maize planting spacing. Comb bar on the mechanism was used to grasp ears off from maize stalks. It is of the advantage of simple structure and low power consumption during operation. Field experiment results showed that it could snap ears well with grain damage rate of 0.09%, grain loss rate of 0.04% and ear loss rate of 1.96%.

2. Maize head with automatically adjustable stripper plates

To solve the problem of stalk breakage and trash contents during maize harvesting by a straight-fluted roll and stripper plates mechanism, a new head has been designed, which allows automatically spacing adjustment between stripper plates according to the diameter of stalks, and the automation mechanism of each row can work independently. It allows stalks to pass the plates smoothly and to reduce breakage of stalk between snapping units. Experimental

results showed that it could snap ears well and reduce the ratio of trash by about 2.28%.

3. Snapping-chopping combined mechanism

A snapping-chopping combined mechanism has been studied and tested to reduce power consumption of stalk chopper during harvesting operation. The mechanism has three rolls, two straight-fluted rolls grasp stalks and pull them downward, ears are snapped off when contacting the stripper plates, at the same time, stalks downward are transported into the third chopping roll, then the stalks will be cut into small pieces by gap disc cutter. Experiment results showed that it could snap ears well and chop stalks well, which could meet the demand of China's national harvesting standards. It can reduce the power consumption by about 60 percent compared with the traditional snapping and stalk chopping mechanism on maize harvesters.

4. Study on the connection between planting pattern and mechanized harvesting technology

There are too many maize planting patterns all over China, even two neighbors in a village will plant in different patterns, which makes maize harvesting very difficult. Field experiments have been conducted to study the connection between planting pattern and mechanized harvesting technology in northeast China and Huang-huai-hai plane since 2008. Experimental results show that planting spacing has no significant effects on yield under same population, but has significant effects on mechanical harvesting loss, because the spacing between snapping units falls to match the planting spacing, which leads to more ear loss in maize head. Based on this study, maize production mechanization technical guidance written by our team has been promulgated by Ministry of Agriculture of the People's Republic of China in 2011. The guidance pointed out that the planting spacing should be 60 cm in Huang-huai-hai plane and 60 cm or 65 cm in Northeast China. Standardized planting spacing promotes the Chinese maize mechanization harvest levels rapidly during the last few years. Maize mechanized harvesting technology written by us has also been selected as the main extension technology by Ministry of Agriculture of the People's Republic of China in 2013.

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