



## XVII<sup>th</sup> World Congress of the International Commission of Agricultural and Biosystems Engineering (CIGR)

Hosted by the Canadian Society for Bioengineering (CSBE/SCGAB)  
Québec City, Canada June 13-17, 2010



### THE DESIGN AND EXPERIMENTAL STUDY OF A BENCH TEST FOR PNEUMATIC SEED METERING DEVICE

WEN ZHONG LIU<sup>1</sup>

<sup>1</sup> W.Z. LIU, China, ndjxc@yahoo.com.cn.

#### CSBE100422 – Presented at Section III: Equipment Engineering for Plant Production Conference

**ABSTRACT** A bench test for seed metering device was designed in accordance with a seed metering theory based on pneumatic seed metering. The goal to be achieved is to minimize pollution and save seeds, as well as the test the effectiveness to confirm this device as favorable and capable of satisfying the requirements of the experiment. The rotation speed of the seed metering disk and the vacuum degree in the suction chamber were used as experimental factors. Based on this a single factor experiment, with the influence of the prviously mentionned factors, on seed metering performance of soybean was conducted and the result showed the following: The rotation speed of seed metering disk is consistant with the vacuum degree in suction chamber obtained by theoretical calculation. However, when the rotation speed of seed metering disk exceeds the rotation speed of seed metering disk that is adapted to the vacuum degree obtained during theoretical calculations, the seeding quality will diminished and the seeding rate misses increase prominently to the maximum value of 29.63%. When the vacuum degree in the suction chamber is 2.5 kpa, the seeding rate misses increase. Meanwhile, the standard seeding rate tends to decrease when the rotation speed of seed metering disk increases. When the rotation speed of seed metering disk is fixed at 54 rpm, the standard seeding rate varies in the range of 76.11% to 80.65% with a vacuum degree of 1.5 kpa in suction chamber, when the vacuum degree in suction chamber is lower than 1.5 kpa, the standard seeding rate will decreases proportionally, and when the vacuum degree in suction chamber is 1.0 kpa ,the standard seeding rate only reaches 52.07%,and the seeding rate misses, however, go up to 40.83%.

**Keywords:** Pneumatic Seed metering.