

新型气力精密排种器的空气动力学原理

The Aerodynamic Principle of a New Air Precision Seed Metering Device

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中文摘要:

提出一种具有控制充种室种子群结构的新型气力精密排种器的空气动力学原理。采用 $K-\epsilon$ 湍流模型和SIMPLE算法, 预测了充种室的流场, 数值计算结果和实验相符。数值预测出在充种室的不对称射流产生了一个有利于改善充种和清种的回流区。这种排种器已成功地用于精密播种机上。

英文摘要:

This paper puts forward the aerodynamic principle of using nonsymmetrical jet for high filling seed frequency and cleaning the surplus seeds. A new type of air precision seed metering device with high filling frequency has been designed in accordance with this principle. This paper also points out the characteristics of the nonsymmetrical jet in the APSD (Air Precision Seed metering Device). The turbulence model invokes $K-\epsilon$ model. The numerical predictions are based SIMPLE method. Through the comparisons between the predictions and the measurements, the validity of the mathematical model is confirmed. The predictions are made out for a large recirculation zone on the APSD chamber which is available for filling and cleaning seeds. This APSD has been demonstrated to be capable of highly increasing discharge seeds frequency of the seed metering device. It has already been successfully used in the precision planter.

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