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RESEARCH STATUS AND DEVELOPMENT SUGGESTIONS OF BREEDING AND SEEDING APPARATUS IN SMALL AREA

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Summary. *The development of the cell seed feeder is important for the world seed industry, it can improve the breeding efficiency, shorten the breeding cycle and promote the development of the breeding industry. In order to promote the mechanization process of community breeding in the world, it is necessary to combine the requirements of breeding agronomy and work. In this paper, we summarize the research status of various seed dispensers for breeding. At the same time, the components and working principle of the main breeding device were expounded in detail.*

Seeders in different crop plots have different standards according to agronomic requirements. At the same time, the number of seeds sown is limited and the varieties are diverse. Therefore, seeds of different varieties need to be planted in the corresponding test area strictly and accurately in accordance with the requirements [1] and the seeder is required to have the corresponding self-purification function, that is, the residual seeds in the seed discharge device can be quickly cleaned up after the planting of a test plot to prevent seeds from being mixed. The accuracy of the plot test is affected [2].

The seeding machine can do multi-species seeding in one seeding process, and the seeding device is operable and can be adjusted simply. There are spacer aisles between adjacent breeding test plots, the length of which is generally 0.5~1.5 m, and the seed clearing process is generally carried out in the aisles [3].

Figure 1 – Structural diagram of the Wintersteiger seeder part and MONOSEM seed metering device

Plot breeding test has high requirements on precision sowing parameters such as plant, row spacing and sowing depth, and should ensure that there is no variety mixing among the plots. The experimental base of alfalfa breeding in saline-alkali land in the agricultural high area of Dongying Yellow River Delta was taken as an example. The length of each cell is 5 m, the width is 3 m, the interval is 0.5 m, and the aisle is 1 m. In order to facilitate the machine to enter

and turn around, the distance between the cell and the ground is 5 m, as shown in figure 2. For alfalfa breeding, the sowing plant spacing was 300 mm, the hole spacing was 200 mm, and the sowing depth was 20 mm, as shown in figure 2.

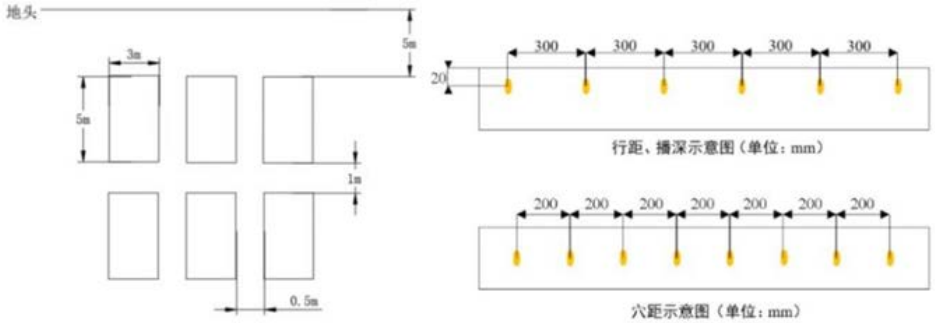

Figure 2 – Schematic diagrams of the localized plan of the subdivision (left) and of agronomic parameters (right)

Seeders can be pneumatic and mechanical. The mechanical structure is simple, stable and reliable, but it is not suitable for precision sowing, cause it can damage the seeds. The pneumatic type [4] has a relatively complex structure, but high seeding quality, that can be used to precision seeding, and has no requirements for seed grading treatment and low seed breakage rate. The pneumatic seed feeder is the main direction of the seed feeder used in breeding.

The mechanical type mainly includes disc type, finger clip type, groove wheel type and so on. Historically mechanical seeders are varied in structure, such as socket wheel type, vertical disc type, inclined disc type and so on. The working principle of these seed discharge devices is mainly to use the rotation or reciprocating movement of mechanical parts to discharge the seeds from the seed box and put the seeds into the soil in a certain way.

Conclusion. Seeds of different kinds need to be seeded into the corresponding test area strictly and accurately, the seeder should have the corresponding self-cleaning function, which is higher than the field seed feeder. Among the existing seed dispenser for breeding, the air-suction seed dispenser has the advantages of no damage to seed, adapting to seed shape, fast seeding speed and high seeding efficiency, which should be regarded as an important direction for the development of seed dispenser for breeding.

References

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