

## Dynamic Knowledge Model for Design of Population Density and Sowing Rate in Cotton

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**Abstract:** By summarizing, analyzing and extracting the newest research data on planting density and sowing rate, and basing on the knowledge of many experts in cotton, a dynamic knowledge model for decision-making on planting density and sowing rate of cotton under different environments and yield targets with extensive suitability was developed by quantifying the effects of climate, soil, yield, management level and variety. On Windows 98 system, the knowledge model and parameters were translated into computer program with the VC++ 6.0 programming

language, tested and revised with experiment data in different plant environments. Case studies on the knowledge model with the experiment data sets of different eco-sites (Anyang, Nanjing, Shihezi and Taiyuan), varieties, soil types and yields indicated the prediction results were similar to the experiment with error below 10%. It suggested that the knowledge model was good for decision-making and application.

In this paper, because boll rate was effected by many factors, such as diseases and insects, when the planting density decision knowledge model was developed, the affection of boll rate to planting density should be treated simply. In the future, in order to apply the planting density knowledge model accurately in practice, it should be revised and reinforced.

**Key words:** cotton; planting density; sowing rate; knowledge model