

## SOYBEAN BREEDING IN CHINA, WITH EMPHASIS ON HYBRID SOYBEANS

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### Summary

Soybean, the forth-biggest field crop in China, distributed in the most parts of the country, but mainly in the northeast. In 2004, 9.589 million hectares of soybeans were grown with an average yield of 1.815 tons per hectare, and the total output was 17.4 million tons. To meet the huge domestic demand of soyben products, China imported 20.23 million tons of soybean and more than 2 million tons of soy oil that year.

China began to improve soybean varieties with modern genetic theory and breeding methods in 1913. Up to 2005, about 1100 developed soybean varieties were approved for release in the whole country. Compared with landraces, the improved varieties were superior in earliness, lodging resistance, yield potential, disease resistance, and quality. The highest yield record occurred in Heilongjiang Province where the variety Lunxuan No.1 yielded 5.97 tons per hectare in 2005. Since late 1990s, the improvement of oil content has been emphasized in the main soybea producing area, especially in the northeast. Some high-oil (21.5% or above) varieties were then developed and rapidly released for commercial production. In 2005, the average contents of oil and protein of 25 nation-approved varieties were 20.72% and 40.50%, respectively. Attention was paid also to the breeding of varieties resistant to the major diseases, including soybean mosaic virus (SMV), soybean cyst nematode (*Heterodera glycines*), frog-eye spot (*Cercospora sojina*), soybean rust (*Phakospora pachyrhizi*), etc.

Chinese scientists started to study hybrid soybeans in the 1980s. In 1993, Sun and his co-workers from Jilin Academy of Agricultural Sciences first developed a male-sterile line due to cytoplasmic-nuclear interaction through hybridization and backcrossing between *G. max* and *G. soja*. They also obtained the maintainers and restorers later. In 1995, they developed first cultivated-type cytoplasmic male sterile line. In 2002, the first soybean hybrid "HybSoya No.1" was approved to release in Jilin Province. The hybrid yielded 21.9% higher than the pureline control in the uniform tests. To make hybrid seed production economical, they extensively tested F1 hybrid vigor, developed better sterile lines, restorers and maintainers, and studied more efficient insect-mediated pollen transfer system. Besides Jilin Academy of Agricultural Sciences, Nanjing Agricultural University and Anhui Academy of Agricultural Sciences also developed their own cytoplasmic-nuclear male sterile lines and made progress in the breeding of hybrid soybeans.