

## SUNFLOWERS NEEDED BY THE CHINESE MARKET

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### Abstract

With about one million hectares of sunflower growing area in China, the market for any suitable variety of sunflower would be huge. However, because of the large span of the country, varieties differ from region to region. Furthermore, consumers have different consuming habits, and growers have different growing practices. They all have their own favorites. If a variety is accepted neither by the growers nor by the consumers, it will have no market. So the goal is to find suitable varieties for different regions, or varieties favored by certain growers or consumers.

### Introduction

Sunflower cultivation has a long history in China, and it can be found almost everywhere in the country. However, its main growing region is in the northern part of China, including the northeast and northwest parts of China. The growing area in these places is over 60% of the total growing area in China. In some regions sunflower can be sown twice a year, spring sowing and summer sowing. In 1955, the total area of sunflower reached 70,000 ha. Most of this area was confectionery sunflower. Later on, with the introduction of oil sunflower varieties from the former Soviet Union, sunflower growing developed quickly. In 1981, the total sunflower growing area reached 106,700 ha. The most rapid development of sunflower had occurred in 1980s and 1990s. By the end of the last century, China had over 1,000,000 ha of sunflower.

### Discussion

**Oil Sunflower.** Oil sunflower is grown mostly in the northern part of China. There is some cultivation of oil sunflower in southern China as well, such as in Sichuan, Yunnan, Guizhou, Jiangsu, etc., but the area is small. Five northern provinces and autonomous regions, namely Heilongjiang, Jilin, Inner Mongolia, Shanxi, and Xijiang, account for nearly 90% of the total oil sunflower production.

**Currently Used Varieties.** Since China has a long history of sunflower production, there are many varieties of oil sunflower that are used in production. Among these varieties, we can divide them into two types: one is a local variety; the other is variety introduced from abroad.

Local varieties mostly come from agriculture research organizations from different provinces or autonomous regions. Usually each organization has their own series of varieties. All these organizations are located in the northern part of China, but the varieties bred by them are widely used not only in the major sunflower provinces, but also in other regions and

provinces in China. The following varieties are commonly used in different parts of China: Neikuiza series from Inner Mongolia; Bakuiza series from Bameng of Inner Mongolia; Longkuiza series from Heilongjiang; Liaokuiza series from Liaoning; Baikuiza series from Baicheng of Jilin; Jikuiza series from Jilin; Fenkuiza series from Shanxi; and Xinkuiza series from Xinjiang. The maturity of these varieties in days usually ranges from 100 to 110, with oil content from 39% to 49%, and plant height from 170 to 200 cm.

Apart from so many local varieties, there are also quite a few foreign varieties on the market. The most successful one is G101 from DeKalb Company of the USA. It has been on the Chinese market for over 20 years with a present market share of over 10%. Other foreign varieties include varieties from Limagrain of France; Semena of Switzerland; Syngenta India and Spain; and Cargill from the USA. These varieties have a higher oil content of 40% - 50% and a uniform plant height of 160 to 170 cm.

Can these varieties suffice the growers' need? Even with so many varieties on the market, it is hard to say that the growers are satisfied. This is not to say that these varieties are not good; actually some of these are really excellent varieties. But what the growers think is the problem. This differs from variety to variety, and from region to region.

What varieties do the growers need? We have to answer this question differently for local varieties and foreign varieties.

**Local Varieties.** Local varieties enjoy a very big market share. This is mainly due to the cheap price of the seeds. But the growers have a lot of complaints about these varieties. The yield is not ideal. Oil content is low. They need to sow more seeds, since the seed quality is not good. Very often the plants grow too high, so lodging happens easily and thus they would harvest nothing. Nevertheless, many growers still like to use local varieties. For example, in the northeast part of China, sunflower is grown mostly on infertile land where farmers manage this crop extensively. As they do not expect a good harvest, they wish the minimum investment in seed, labor, and management.

However, along with the progress in breeding technology, more and more local varieties can compete with foreign varieties. They are even better than foreign varieties in yield and oil content. Once the seed cleaning, processing, and grading are improved, they will have a bigger market in sunflower growing regions with intensive field management.

**Foreign Varieties.** Foreign varieties enjoy a better market in Xinjiang, Inner Mongolia, and part of Jilin province. In these regions sunflower is grown intensely. The farmers would pay a comparatively higher price for the seeds, because they can always anticipate having a good harvest. The yield in these regions usually reaches 3,750-4,500 kg/ha. As sunflower production is usually cyclic, after two or three years of normal production, there will be overproduction. The growers would have great difficulty selling their products, so the growing of sunflower will be reduced greatly in the following two years. Under these circumstances, it is very hard for foreign varieties to have a stable market. To avoid this problem, many foreign companies now have their seeds produced in China, which has lowered the cost of seed. It has been proven as an effective measure for the seed sales of foreign varieties.

**Other Problems.** We've explained the advantages and disadvantages of local varieties and foreign varieties. There are also some other problems that the growers hope to solve through improved varieties. Diseases are a problem in some places, for example in Yili of Xinjiang autonomous region, where the local climatic condition is suitable only for sunflower production. Sunflower is the only crop, and it is grown year after year. As a result, the disease

is very serious, especially *Sclerotinia*. Some varieties, for example Xinkuiza No. 4 and G101, have a certain tolerance to this disease, but no variety is disease resistant. If a disease-resistant variety were available for the growers, its market potential would be huge. There are too many of these kinds of fields in China.

Lodging problems are present more and more in newly opened fields used for growing sunflower, and has become a serious problem. These newly opened fields are often in mountain regions or on low-lying beach land, where strong winds frequently blow. Even foreign varieties with a plant height of only 160 cm are easily blown down, let alone local varieties that are usually over 180 cm in high. So there will be a great potentiality for short-stature varieties in these places.

***Confectionery Sunflower.*** Traditionally, confectionery sunflower is grown almost everywhere in China. Due to its characteristics, it is likely to be found in saline-alkaline fields, drought fields, or infertile fields. As a result, the yield is quite low. The average yield throughout China is only around 1,500 kg/ha. Confectionery sunflower has more than 60% of the total sunflower production in China. Nearly 100% of the local varieties are open-pollinated varieties. In the 1990s, hybrid varieties were introduced into China. Now there are seven or eight foreign varieties that are grown by the farmers. Only two or three are the Israeli type. The rest are the Kansas type.

The growers' and consumers' first choice is the Israeli type. All local Chinese varieties are the Israeli type. The most popular variety is Sandaomei. Its seed is narrow and long. As it is an open-pollinated variety, its yield is quite low, and 1/2 or even 2/3 of the seed inside is empty. Hybrid varieties from Israel have been growing in China for several years. But the growers have pollination problems with these varieties. These varieties usually need further pollination by hand, otherwise, the seed set will not be good, and the production will be affected. Since confectionery sunflower is grown in very large areas, it is not realistic to pollinate by hand. This has limited the spread of these varieties.

The Kansas type is playing an important role in confectionery sunflower production. The Kansas type can reach a yield of 4,500–5,250 kg/ha. In spite of the high seed price, the farmers are beginning to accept it, because it produces a better yield. But, a problem also exists with this type. It is difficult to persuade the consumers to accept this type of seed. Confectionery sunflower is mainly used as a snack in China. The short and broad sunflower seed of the Kansas type is only used in the food industry when it is hulled. The quantity used for this purpose is not large at present. As a snack, it is hard to eat, because the consumer cracks the seed between the teeth, but due to its short and broad shape, it is difficult to crack. More than half of the confectionery sunflower is for snack in China. This Kansas type will only have a limited market if it is used for snack purposes.

The most desirable confectionery sunflower combines the advantages of the Israeli type and the Kansas type; we can then find a variety most wanted in China, a variety with a long seed shape and high yield. There are about 600,000 ha of confectionery sunflower in China, and this means that a total seed requirement would be more than 3,000 tons. The potentiality for confectionery sunflower is obvious.

## Conclusions

It is impossible to satisfy all growers and consumers with one single variety. However, based on the analysis of the farmers' growing practices and the consumers' different hobbies,

it is feasible to provide several different varieties for different markets, and thus make both the growers and consumers satisfied. Because of the big market of sunflower in China, it is worthwhile to do this.

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