



KAPURIYA ENTERPRISE

IMPORT-EXPORT
SPICES AND OILSEEDS

Physical Properties of Groundnuts

Abstract

Groundnut, a crop rich in nutrients, originated in South America and spread to the rest of the world. Cultivated groundnut contains a fraction of the genetic diversity present in their closely related wild relatives, which is not more than 13 %, due to domestication bottleneck. Closely related ones are placed in section *Arachis*, which have not been extensively utilized until now due to ploidy differences between the cultivated and wild relatives. To overcome *Arachis* species utilization bottleneck, many tetraploid synthetics were developed at the Legume Cell Biology Unit of Grain Legumes Program, ICRISAT, India. Evaluation of synthetics for some of the constraints showed that these were good sources of multiple disease and pest resistances. Some of the synthetics were utilized by developing ABQTL mapping populations, which were screened for some biotic and abiotic constraints. Phenotyping experiments showed ABQTL progeny lines with traits of interest necessary for the improvement of groundnut.

Introduction

Groundnut botanically known as *Arachis hypogea* belongs to Leguminosae family. India is the second largest producer of groundnut after China accounted for 21.03% share in the world production during 2003. It is the largest oilseed in India in terms of production. Groundnut accounted for 34.66 % of the production of oilseeds in the country during 2001-02. Gujarat is the largest producer contributing 25% of the total production followed by Tamil Nadu (22.48%), Andhra Pradesh (18.81%), Karnataka (12.64%), and Maharashtra (10.09%) during 2002-03. Groundnut contains on an average 40.1% fat, 25.3% protein and is fairly a rich source of calcium, iron and vitamin B complex like thiamine, riboflavin, niacin, and vitamin A. It has multifarious usages. It is not only used as a major cooking medium for various food items but also utilized for manufacture of soap, cosmetics, shaving cream, lubricants, etc. In fact, it plays a pivotal role in oilseed economy of India.

Origin, Area, and distribution

Recent botanical survey has indicated that Brazil in South America is the most likely center of origin of this plant. In India, Jesuit Father (Missionaries) introduced it in first half of the 16th century. It was introduced in Gujarat by Shri Padmabhai Patel of Pipaliya village, taluka dhoraji(Rajkot) in 1910 from Tamil Nadu. It is also known as peanut, earthnut, monkey nut, manilla nut, pinda, goober and kingpin of oilseeds, unpredictable legume and energy capsule. Groundnut is an herbaceous annual with an upright central stem with numerous branches that vary from prostrate to almost erect

depending upon the variety. It has a taproot; stem is cylindrical, hairy and become more or less angular with age. The leaves of groundnut are pinnate with two pairs of leaflets borne on a cylindrical and grooved petiole. The flowers are yellow, complete, papilionate and sessile. Usually, flowering takes place between 24-30 days after sowing, which is little earlier in bunch type than spreading. The flowers open between 6-8 am and fertilization is completed before mid-day. The gynophore is commonly referred to as peg. The peg carrying the ovary pushes itself into the soil. It is only after entering the soil that ovary begins to develop and takes up horizontal position. At the same time, the pod begins to enlarge. The fruit is an indehiscent pod containing 1-5 seeds. The shell of the pod which contains the seed is morphologically the pericarp and the thin skin that covers the seed or nut is the test. The nut is composed of 2 cotyledons, which contain oil and other food materials.

World production of groundnut reached a record of about 21 million tonnes. The most important groundnut producing countries in the world are India, China, USA, West Africa, Sudan, and Nigeria etc. India ranks first in the world in area (8.5 million hectares contributes about 40 % of the total world's area) and production (8.4 million tonnes contributes about 33 % of the total world's production). The average productivity of India is only about 988 kg/ha as against 2995 kg/ha in USA, 2688 kg/ha in China, 1379 kg/ha in Brazil, 1360 kg/ha in Indonesia and 1145 kg/ha in Nigeria.

Among all oilseed crops, groundnut accounts for more than 40-50 % in area and 60 to 70 % in production in the country. Among oilseed crops, groundnut has first place in the country. In India, it is grown in an area of about 85 lakh hectares with the total production of 84 lakh tonnes. Its cultivation in India is mainly confined to the States of Gujarat, Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra, Madhya Pradesh, Uttar Pradesh, Rajasthan, Punjab and Orissa. About 80 % of the total area and 84 % of the total production in the country are confined to first five States. The highest productivity of groundnut (1604 kg/ha) is in State of Tamil Nadu, while in Gujarat the productivity is about 1190 kg/ha.

Table shows the position of the States with respect to area, production and Productivity

Area	Production	Productivity
Gujarat	Gujarat	Tamil Nadu
Andhra Pradesh	Tamil Nadu	Gujarat
Karnataka	Andhra Pradesh	Punjab
Maharashtra	Karnataka	Andhra Pradesh
Tamil Nadu	Maharashtra	Uttar Pradesh

In Gujarat, groundnut is grown in an about 20 lakh hectares area with total production of about 26 lakh tonnes annually. In Gujarat State, groundnut is grown

mainly in the districts of Junagadh, Amreli, Rajkot, Bhavnagar, Jamnagar and Sabarkantha etc. Saurashtra is the heart of the Gujarat and India for groundnut production.

Uses

Almost every part of Groundnut has commercial value. Groundnut is an oilseed crop mainly used for edible oil purpose but used by many other ways. The main uses of Groundnut are as follows:

Edible Oil: The groundnut oil has several uses but mainly used as a cooking oil. It is used in many preparations. It is used in soap making, fuel, cosmetics, shaving cream, leather dressings, furniture cream, lubricants, etc. Groundnut oil is also used in making vanaspati ghee and in fatty acids manufacturing. It is also used as medium of preservation for preparation of pickles, chutney, and other preparations.

Medicinal use: its oil is used in making different types of medicated ointments, plasters, syrups, and in medicated emulsion.

Food Preparation: It is also used to make various food preparation like, butter, milk, candy & chocolate, chutney, groundnut pack, laddu, barfi (chukii), etc.

Kernels: Whole kernels are also used as table purposes by frying, soaking, roasting, boiling and in different types of namkeen. Roasted Groundnut is a most popular way of eating. Kernels also used as a spice in vegetables and as sprouts for salad.

Groundnut cake: It is the liking feed for animal and poultry due to its nutritive value and palatability.

Groundnut Shell: Groundnut shell has great potential for commercial use. It is used as a fuel, filler in cattle feed, hard particle boards, cork substitutes, activated carbon etc.

Groundnut straw: Mainly used as animal feed, fuel and in preparation of compost. The green leaves and stem of plants are used as animal feed. The shell of pods obtained during threshing also used as cattle feed.

Conclusion

There is ample genetic diversity in the wild gene pool which harbours several useful genes for groundnut improvement. Direct utilization of diploid *Arachis* species, which are closely related, is cumbersome due to ploidy differences between the cultivated and wild *Arachis* species germplasm. Utilization of distantly related *Arachis* species

needs in vitro interventions and utilization of both closely and distantly related species in secondary and tertiary gene pools needs an elaborate backcross program for alien introgressions and obtaining stable tetraploid lines. Ample variation is now available in the form of synthetics and double synthetics. Research experience in the utilization of synthetics has shown that stable tetraploid lines with alien introgressions can be achieved in a shorter period and the utilization of suitable molecular markers further accelerates the research programs. The best option for alien introgressions in groundnut is through the utilization of already available tetraploid synthetics and double synthetics in the breeding programs. It is also necessary to develop new sources of tetraploid synthetics so that ample variation is available for groundnut improvement. A range of groundnut synthetics are available at ICRISAT for groundnut researchers for utilization in their breeding programs for groundnut genetic improvement.

Groundnuts









