PRODUCTION—Round table discussions

Germplasm Availability

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Soybean germplasm from Eastern Asia obtained over an 80-year period has been the basis of the present soybean industry in the U.S.

One major requirement for adapting the soybean plant from the hand culturing of Asia to the mechanized culturing of the U.S. was to develop types less subject to shattering as they reached harvestable maturity. While many germplasm lines will shatter 50% of their seed before complete maturity, we have cultivars that will hold their seed for at least six weeks after reaching harvestable maturity.

Soybean germplasm adapted for higher latitudes is maintained by R.L. Bernard, University of Illinois at Urbana. Soybean germplasm adapted to lower latitudes is maintained at Stoneville, Mississippi. Publications are available giving the origin of each strain and its maturity classification as well as many other characteristics. At present, we have 6,500 strains.

Maturity covers a range of those which will mature at 60° latitude to those which will make excellent growth at equatorial latitudes at sea level.

A major use of germplasm lines in U.S. breeding programs is to identify sources of pest resistance and then attempt to transfer this resistance to highly productive cultivars. We have been able to identify sources of resistance to most disease and nematode problems which can cause economic injury. We have identified sources of resistance to foliar-feeding insects and are making progress in transferring these characteristics to productive types.

Protein content of germplasm lines will range from 36 to 48% and oil content from 16 to 23%. There is a very high inverse correlation between oil and protein content of the seed. Weight/100 seeds will range from 4 to 35 g.

An impermeable seed coat characteristic has been transferred from a wild-type to a good agronomic type. This characteristic should improve seed quality for cultivars maturing in warm, humid regions. This characteristic also should aid in preserving seed quality during storage in tropical and subtropical regions.

We have identified sources of resistance to soybean rust, a serious disease of soybeans in Southeast Asia and Australia. We have also identified a source of resistance to mung bean virus which damages soybeans in India.

I believe we have germplasm available to assist research workers in any part of the world that are interested in developing production soybean cultivars for their areas.

A New Soybean for Human Consumption in the Tropics

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ABSTRACT

Modern technology, especially in animal husbandry, has made remarkable progress. Even with all recent advances in animal reproduction (animal protein), we have not been able to keep pace with the rapid population growth rate in order to meet the demand for protein. This discrepancy in demand and supply for animal protein is even more severe in the tropics. The tradition of producing cereals and legumes to feed animals for conversion to meat (protein) is no longer feasible. Usually, animal proteins have complete profiles of essential amino acids, whereas those of plant origin are deficient in one or more of them. Soybean proteins, however, have about the same nutritional value as those of animals, and it is available for direct consumption by humans at a low cost. Because of the "off" or painty flavor, soybeans were not used for direct human consumption for a long time, except in areas such as China, Japan, Korea and Indonesia. Two major limiting factors for production of soybeans in the tropics are (a) lack of varieties adapted to low latitude and shorter days of the cool season, or to high altitude and low temperatures of the tropics, and (b) lack of varieties that are mild in beany flavor and appropriate for direct human consumption. A cross of the selected soybeans Kahala X Lee 68" was made at Iguala ISAAEG Research Station. Several lines were selected in the F_4 generation with good agronomic and organoleptic properties. The resulting variety has been evaluated from 0 to 40° latitude and in the short growing season of low latitude; results were good. The ISAAEG-BM_2 variety of soybean is mild in flavor, and the heat treatment commonly applied to denature antinutritional factors is sufficient to completely eliminate the painty flavor. Details for the synthesis of ISAAEG-BM_2 variety and the recommended cultural practices for its maximal yield is discussed.

INTRODUCTION

Although the potential of raising soybeans in tropical and subtropical climates is enormous (2-3 vs 1 harvest/year in temperate zones), the majority of soybeans are produced in