Influence of Planting Date on Yield and Other Characteristics of Soybeans Grown in Southeast Missouri

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In southeast Missouri the growing season is long, and consequently, soybeans are frequently planted from mid-April to mid-July. The varieties grown range in maturity from those commonly grown in the central Corn Belt to those commonly grown in the northern Cotton Belt, the greater portion of the acreage being planted to full-season varieties such as Ralsoy, Arksoy, and Ogden. Under these conditions, it seems necessary to determine the favorable planting time and the effect that planting date has upon maturity, seed yields, and seed quality of different varieties.

A study to gain information on the effect of date of planting was conducted cooperatively by the U.S. Regional Soybean Laboratory and the Missouri Agricultural Experiment Station on the Southeast Missouri Experiment Field at Sikeston in the four-year period 1942 through 1945.

The photoperiodic response of Mandarin, Peking, Tokyo, and Biloxi soybeans were studied by Garner and Allard (4). In greenhouse experiments in which the varieties were exposed to light periods ranging from 5 to 15 hours, they observed that when the daily illumination consisted of a single exposure of 12 hours or less, the length of the growing period from germination to blooming was only slightly shortened in the early variety, Mandarin; however the shortening effect was proportionally greater for the usually later maturing varieties. In the very late variety, Biloxi, this period was reduced to less than one-fourth of that time required under full daylight exposure during the summer months. Under a daily light exposure of 12 hours or less all varieties became early maturing ones, and there was little difference in the time required by the four varieties to reach the blooming stage.

The same workers (1), in later field studies, planted the above-mentioned varieties at 4- to 5-day intervals throughout the growing season. They obtained pronounced differences in the responses of the early and late varieties to changes in day length. They concluded that under field conditions the differences in the responses of the early and late varieties with respect to time of flowering are largely due to length of day. The time of flowering of plantings at a given date varied considerably from year to year. These variations appeared to be closely correlated with yearly variations in the prevailing temperatures.

A study of floral differentiation upon soybeans grown under nine different photoperiods, including continuous light, was made by Borthwick and Parker (2). They concluded that photoperiodism is extremely important in initiating flowering. The different varieties studied reacted differently to the same day length. Certain soybean varieties flower primordia only when subjected to short photoperiods, while others initiated flower primordia though the plants received continuous illumination.

Cartter and Hopper (3) studied the influence of variety and environment on the chemical composition of soybean seed. Ten varieties and strains were grown at five locations during five seasons. The protein content, oil content, and iodine number of the oil were determined. They found the oil and protein content are largely varietal characteristics influenced by environmental conditions. The influence of environment on protein content is, generally opposite to the influence on oil content; they observed that the iodine number of the oil variety is influenced by the temperatures during the seed development and oil metabolism. High temperatures at this period result in a decrease and low temperatures in an increase in iodine number.

Materials and Methods

Five varieties, selected to represent maturity groups commonly grown from the central Corn Belt to the northern Cotton Belt, were included in the tests. Their rated maturities in days if planted at Sikeston, Mo., on June 1, the average planting date, are as follows: Ralsoy, 137; S-100, 124; Boone, 99; Mandarin, 42; and Dunfield, 100. Each variety was planted at five dates of planting as a split-block feature. Each variety was planted by hand in three-row plots, 18 feet in length, with only the middle row harvested for yield and analytical samples. In 1944 and 1945, the tests were set up with the five dates of planting in a Latin square with the five varieties as a split-block feature. The varieties were arranged in order of decreasing maturity with a border of Ralsoy and Dunfield between each of the different dates of planting. The rows, during all four years, were trimmed to 16 inches.