RESPONSE OF COTTON VARIETIES TO PRE-EMERGENCE CIPC ON PIEDMONT SOIL

IN LOUISIANA and Arkansas experiments on the response of cotton varieties to pre-emergence herbicides there were no marked differential effects. Since the action of chemicals on weed seed varies widely with different soils and climatic factors, it is possible that varietal responses also may be quite different. Consequently, experiments were conducted during 1957 and 1958 at Athens, Georgia, on Cecil clay loam to determine possible variety × herbicide interactions under Piedmont Plateau conditions.

Eleven varieties and strains were used as follows: Austin, Z106, SUD37, Pope, Coker 100W, SUD43, M8948, Pima S-1, Brazos, Plains, and Empire. Isopropyl-N-(chlorophenyl) carbamate (CIPC), the only pre-emergence herbicide recommended for cotton in Georgia, was applied at rates of 12 and 24 pounds per acre (recommended dosage is 6 to 9 pounds per acre) in an attempt to appraise critically differential varietal responses and to determine the effects of overdosage. A split-plot design with 4 replicates was used with rates of CIPC (0, 12, and 24 pounds per acre) as whole plots and varieties as sub-plots. Applications were made with a calibrated experimental plot sprayer after the cotton was planted. In 1957, the cotton plants were pulled, counted, and weighed 4 weeks after emergence. In 1958, initial counts were made; then the plants were thinned to a uniform stand and grown to maturity. In both years, untreated plots were hand weeded.

In 1957, percentages of germination were 66, 65, and 61 following the 0, 12, and 24 pounds per acre CIPC applications, respectively. Average plant weights were 1.2, 1.2, and 1.0 g., respectively. The F values for stand and green weight as affected by CIPC were significant, but no significant variety × herbicide interaction occurred. Yield reductions in this study appeared unlikely. In 1958, germination of cotton seed again was reduced by CIPC, particularly at the 24 pounds per acre rate. Although the F value for the variety × herbicide interaction was not significant, the varieties Austin, Coker 100W, and Empire showed a trend toward reduced stands following treatments with CIPC at 24 pounds per acre. Average over-all yield was not decreased by CIPC at any rate used.

These results indicate that yield reduction caused by differential cotton varietal response to pre-emergence applications of CIPC on Piedmont soil is not probable even if 3 to 4 times the normal dosage is used. Furthermore, the somewhat reduced stands induced herbicidally in 1958 were not reflected in final average yields, which emphasizes the relative safety of CIPC for farm use.—J. B. Weaver, Jr., formerly Assistant Agronomist, College Experiment Station, Athens, Georgia.

CROSS-COMPATIBILITY OF ANNUAL AND PERENNIAL RYEGRASSES WITH TALL FESCUE

THE possibility of combining desirable traits from the fescues, meadow (Festuca elatior (F. arundinacea Schreb.), has received sporadic attention abroad. Although intergeneric hybrids have been obtained further selection has been limited by sterility and the small number of hybrids studied. Most hybridization studies have involved self-pollination and various types of pollen transfer. Obtained hybrids by enclosing unemasculated inflorescences of Lolium perenne L. with panicles of Festuca L. inadequate for use in developing the methods used for the experiments conducted cooperatively by the University of Georgia Experiment Stations and the Crops Research Division, ARS, USDA, and the Kentucky Agricultural Experiment Station. The investigation reported in this paper is in connection with a project of the Kentucky Agr. Exp. Sta. and is published by their permission.

Studies conducted cooperatively by the University of Georgia Experiment Stations and the Crops Research Division, ARS, USDA.

Information obtained by Beddows and Crowder was used in developing the methods used for the experiments. Beddows reported that the ryegrasses were largely self-sterile, while Crowder found that the panicule-type tall fescue was dominant to the spike-type ryegrass.

The technique adopted involved the collection of unemasculated ryegrass spikes with tall fescue detached panicles. Tall fescue served as the female parent with the inflorescences being placed above the ryegrass. Prior to flowering, 4 spikes of ryegrass were placed in a 35-pound parchment bag together with a detached panicle of tall fescue. The tall fescue was kept in vials of water throughout the pollination period. The stems of both parents were wrapped with parchment bags fastened securely around the cotton. The stems were tied to a stake for support. Four parchment bags were placed on each maternal parent; therefore, 4 spikes and 4 detached tall fescue culms were required for each cross. The tall fescue culms were removed from the bags when pollination was complete. Seed for each fescue parent was labeled, kept separate, and sterilized soil.

In 1953, 19 annual and 10 perennial ryegrass parents were crossed with tall fescue. Seed was planted the following spring. Plants with panicle-type inflorescences were removed as F₁ hybrids of ryegrass × tall fescue. Ten one hybrids were obtained from the annual ryegrass crosses, and one hybrid was obtained from the perennial ryegrass crosses. The range in viable hybrid seed produced per plant from the annual ryegrass crosses was

Although the total number of plants in this study was relatively small, the number of hybrids obtained from the annual ryegrass parents as compared with the perennial parents suggests that tall fescue is compatible with annual than with perennial ryegrass.

In 1957, 25 annual ryegrass plants were crossed with tall fescue in an effort to obtain additional annual ryegrass parents for hybridization and to determine the possibility of combining desirable traits of the annual ryegrass types.