EFFECTS OF SORGHUM RESIDUES ON CROP YIELDS

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It is generally accepted in the United States that crops planted in the fall after sorghums do not yield as well as when following other crops. This has been proved by practically all the experimental data available, although in exceptional cases larger crop yields have been secured following sorghums than when following corn or certain other crops. Unfortunately, there are few experimental data on the after effects of sorghums on soils or crops in Asia or Africa where the sorghums are said to have originated and where they have been grown for many centuries.

Breazeale (1) states, however, that he was informed that in China sorghum is grown year after year upon the best land, and that no injurious after effects from the crop had been observed.

King (5) made no mention of any harmful after effects of sorghums in writing on Oriental agriculture, and it is possible that the deleterious effects of sorghums are overcome by the systems of soil management used in southeastern Asia.

Sewell (6) lists five possible causes of the injurious effects of sorghums, namely, (a) depletion of minerals, (b) toxic root excretions, (c) toxic products of decay, (d) diseases associated with the crop, and (e) the effects of soil protozoa and other micro-organisms. Another theory which has been rather popular of late is based on the fact that sorghums are richer in easily decomposable carbohydrates than other crops. Sorghum residues, roots and tops, when incorporated with the soil are believed, according to this theory, to supply energy materials for an abundant microflora and the organisms compete with higher plants for the essential elements, especially nitrogen.

Sewell (6), in a comparison of treated and untreated corn soil, obtained a depression in the yield of wheat when he added dried, chopped kafir roots to the soil. He concluded, however, that the difference was not significant.

Breazeale (1) noted that wheat seedlings were able to secure nitrogenous materials for growth from decomposing corn stubble much sooner, and to a larger extent, than from decomposing kafir stubble.

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3Reference by number is to “Literature Cited,” p. 849.