Companion Crops for Weed Control in Soybeans

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WEEDS are one of the major considerations in soybean production. Because of weeds, soybeans are generally planted in rows sufficiently far apart to permit cultivation with tractor power. Because cultivation accentuates soil erosion and organic matter losses, other methods of weed control would be more desirable.

When soybeans are sown with a grain drill in rows 6 or 7 inches apart, weed control is limited to human labor, herbicides, or tillage with the rotary hoe, spike-tooth harrow, or weeder. At present, herbicides are neither dependable nor entirely safe for weed control in soybeans. Successful use of the rotary hoe, harrow, or weeder is dependent on fairly uniform emergence of weeds, favorable weather and soil conditions, and a size differential between soybeans and weeds.

A new practice in soybean production—the use of companion crop competition for weed control—is presented in this paper. The use of weed-competitive crops sown with soybeans is relatively inexpensive; whereas chemical or tillage control methods require additional labor and a cash outlay for chemicals, machinery, and power. In addition to weed control, the new method eliminates cultivation of widely spaced rows and provides soil cover when the soybeans are small, thus reducing soil erosion and organic matter losses associated with normal production methods.

EXPERIMENTAL PROCEDURE

Two methods of using companion crops were tried: A.—sown immediately after planting soybeans, and B.—sown 18 days before planting soybeans.

Within method A, soybeans sown in non-cultivated rows 6 inches apart with and without companion crops were compared with soybeans planted in cultivated rows 40 inches apart with and without companion crops (figure 1). In addition, various companion crops and rates of sowing companion crops were compared.

Within method B, soybeans sown in non-cultivated rows 6 inches apart with companion crops were compared with soybeans planted in non-cultivated rows 40 inches apart with companion crops. In addition, various companion crops were compared.

In all trials, soybeans were inoculated. On non-cultivated plots, winter wheat, winter rye, alfalfa, and corn drilled were companion crops sown with a grain drill; alfalfa, red clover, timothy, bromegrass, or winter vetch companion crops were mixed with sand, and were broadcast and harrowed to cover the seed. On cultivated plots, companion crops were sown directly over the soybean row with a calibrated Planet Jr. garden planter.

Trials were conducted in 1952 and 1953 on Vermillion silt loam at Rosemount, Minn., and in 1953 on Storden silt loam at Westbrook, Minn.

COMPANION CROPS SOWN IMMEDIATELY AFTER SOYBEANS

On May 17, 1952, and May 26, 1953, at Rosemount, Ottawa county, Minn., soybeans were sown 6 inches apart for cultivation. The companion crops were not plowed under for cultivation.

In 1952 the companion crops compared were winter wheat, winter rye, Ranger alfalfa, medium red clover, timothy, and bromegrass at sowing rates of 60, 56, 10, 10, 6, or 10 pounds per acre, respectively, in the non-cultivated soybeans and at rates of 4, 4, 3, or 4 pounds per acre, respectively in the cultivated rows 40 inches apart.

In 1953 the companion crops compared in the cultivated soybeans were winter wheat at 30, 60, or 90 pounds per acre, winter rye at 28, 56, or 84 pounds per acre, Chang field peas, winter rye, or bromegrass at 30, 74, 15, or 4 pounds per acre, respectively.

COMPANION CROPS SOWN 18 DAYS BEFORE SOYBEANS

In 1952 the companion crops compared were winter wheat, winter rye, Ranger alfalfa, medium red clover, timothy, and bromegrass at sowing rates of 60, 56, 10, 10, 6, or 10 pounds per acre, respectively, in the non-cultivated soybeans and at rates of 4, 4, 3, or 4 pounds per acre, respectively in the cultivated rows 40 inches apart.

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