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Interseeding Cover Crops or Meadows in Corn

Purdue University Cooperative Extension Service

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INTERSEEDING COVER CROPS OR MEADOWS IN CORN

Prepared by Members of the Agronomy Department

Some midwestern farmers have shown a keen interest in establishing a meadow, small grain, or cover crop in growing corn. Late summer seedings of rye, wheat and other winter grains were made for many years. Late June seedings of grasses and legumes in 38-to-42-inch rows, with 12,000 to 18,000 corn plants per acre, were tried but gave little success.

Widening corn rows to 60 to 80 inches, but maintaining similar plant populations per acre, gave most satisfactory stands of these seedings.

For 4 years, Purdue researchers in Experiment Station tests, and extension specialists in cooperative field demonstrations in many counties, made interseeding trials in corn. Listed below are some of the advantages and limitations found with this practice in 40-inch and wider row widths.

Advantages of Wide Corn Rows

1. Legume and grass seedings made at last cultivation are more likely to catch in wide rows than in 40-inch rows. Broadcast seedings in the narrow rows are rarely successful. Sweet clover and ryegrass have been most frequently established, but failures have about equalled success.
2. Wider rows allow more light to penetrate through the corn, give less competition for soil moisture in the middle interspace and allow the use of seeding machinery for a better job of seeding.
3. Corn yields appear not to be greatly reduced in 60-inch row spacings, so a higher percentage of good farm land may be in corn when seedings for soil improvement, winter cover, or hay and pasture are established without small grain in the rotation.

Problems of Wide-Row Planting

1. Success with seedings in corn in wide rows requires high fertility and good moisture conditions during July, August and September. Midsummer droughts are a serious handicap to young seedlings. The corn may not leave enough moisture for the seedings.
2. Corn rows wider than 40 inches require machinery adaptation. Lack of adapted equipment keeps many farmers from adopting the system; however, as soon as there is a demand for it, machinery designed to meet the needs can be developed.

Research work for the Purdue Experiment Station conducted and reported by O. W. Luetkemeier; extension demonstration work in cooperation with county agents reported by K. E. Beeson and G. P. Walker.

3. Poor survival of seedling, in a band 10 to 15 inches wide along the corn row, often results.

4. If seeding is intended for hay, it is almost necessary to use some type of corn stalk chopper, unless the corn is used for silage.

Corn Yields in Bushels Per Acre at 15.5% Moisture with Various Row Widths at the Purdue Agronomy Farm, Lafayette.

Row Width	1952	1953	1954
40 inches	107	120	129
60 inches	-	114	119
80 inches	85	108	106
Alternating 40 and 80 inches	94	112	-

Effect of Widening Rows on Corn Yields. In the trials reported, spreading corn rows to 60 inches decreased yields 5 to 8 percent compared to 40-inch rows, where populations per acre were the same. Alternating 40 and 80-inch rows showed 7 to 12 percent lower yields; widening to 80-inch rows lowered yields 10 to 21 percent.

The corn was planted in a rotation at 15,000 plants per acre. Soil type was Raub silt loam with a high fertility level.

Increasing the rate of planting corn in wide rows, to maintain population per acre, leads to keener competition between plants than with conventional spacing. In years of severe drought, or in soils of poor phyical condition or low fertility, plants suffer more with greater reduction in yield than if spaced farther apart in 40-inch rows.

Much better establishment of seedings, with favorable moisture conditions, has resulted in 60-inch corn rows. This row width permits seeding with a cultipacker-type seeder pulled by a small tractor.

Forty-inch rows do not seem adapted for establishing seedings unless the corn population is reduced to 6,000 to 8,000 plants per acre. Alternating 40-inch and 80-inch rows have given good stands between the wide rows but not as good in the narrow middles. This practice has the advantage that conventional corn production equipment can be used.

Time of Seeding. Most successful seedings of legumes and grasses have been made immediately after an early second cultivation, when the corn is 12 to 15 inches high. Seedings made after one cultivation usually have been hurt later in the season by weeds. June is not the best time for sowing legumes and grasses. Poor soil covering, weed competition, low fertility, inadequate fertilization, high soil temperatures and midsummer droughts all may handicap young seedlings.

Summer Grain Seedings. Seedings of rye should be delayed until the middle of August because of damage by rust when seeded early. Generally wheat should not be seeded until after fly-free date, although new varieties that are fly-resistant may be sown about the same date as recommended for rye. Seedings in tall corn are usually made by plane, or special tractor row seeders at 1.5 to

2 bushels of grain per acre. With these methods, seed is covered only by rains and stands may be spotty. Stands and growth will be better where corn stands erect enough to permit row seedings with tools that cultivate and cover in the same operation; also, direct fertilization is possible.

Methods for June Seedings. A cultipacker-type seeder is a desirable implement for seeding, as it produces a firm seedbed and allows just the right amount of soil cover on the seed. Considerable success has been obtained by using a general purpose grain drill, equipped with band seeding attachments, and removing some of the discs to miss the corn rows.

Relatively poor results have followed broadcasting the seed. If this method is followed, seeding should follow cultivation to avoid deep covering. Moderate rains following will improve chances for a stand.

Species Best Adapted to Interseeding. Legumes which have been successfully grown in corn are Korean lespedeza, sweet clover, alfalfa, red clover and ladino clover. Rye, ryegrass, orchardgrass and tall fescue have been the more promising grasses. Many other legumes and grasses have been tried, including: several varieties of alfalfa and sweet clover, red clover, sub or Marsh clover, Ladino, Pilgrim ladino, three varieties of winter vetch including Auburn woolly-pcd, soybeans, cow peas, birdsfoot trefoil, crimson clover, berseem clover, partridge pea, Korean lespedeza, Austrian peas, velvet beans, blue lupine. Grasses tried include: Reed canary, tall fescue, orchard, annual and perennial ryegrass, timothy, brome.

Seed Suggestion and Rates Per Acre, primarily for hay and pasture the following year:

1. Mixture: Alfalfa-5 lb., Ladino-1/4 lb., orchardgrass-3 lb., Korean lespedeza-5 lb.
2. Alfalfa - hardy varieties.....8 to 10 lb.
3. Red clover - Kenland preferred.....8 to 10 lb.
   (Not as consistent in catching and growing as alfalfa, unless rainfall in late summer is favorable.)
4. Ladino.....1 lb.
   Spreading habit may fill corn rows during second year.
5. Korean lespedeza.....10 lb.
   Grows well in corn but is killed by first freeze.
6. Orchard grass.....6 lb.
   (Has grown better in corn to date than other grasses--makes early spring growth. It is suggested as the best choice of grass for "shot-gun" mixtures. Timothy and bromegrass have given only fair stands.)

Green Manure and Cover Crops, primarily for cover crop and soil building:

1. Mixture: Perennial ryegrass.....5 lb.
   Sweet clover.....5 lb.
   Korean lespedeza.....5 lb.
2. Sweet clover (Madrid, Evergreen may be slightly better than common).
   .....8-12 lb.
3. Non-hardy alfalfa.....8 lb.

4. For August seeding:
   Mixture: (a) Rye.....1 1/2 bu.
   Winter or hairy vetch.....10 lb.
   (Woolly-pod is promising; all vetch varieties may winter kill.)
   (b) Rye, fly-resistant wheat or other winter grain.
   .....1 1/2 to 2 bu.

Summary

Successful stands and growth in a large number of broadcast interseeding trials in high yielding corn during the past five years were too infrequent to be considered practical where corn was planted in 40-inch rows.

Stands and growth were satisfactory only where July and early August rainfall was much heavier than average and well distributed.

In Lawrence county on old thin pasture land, stands from well-fertilized seedings at corn planting time, without further cultivation, were successful when the corn population was reduced to 6000 to 8000 stalks per acre and summer rainfall was near average.

Widening corn rows from 40 to 60 inches, permitting use of special seeding equipment that covered the seed, produced better stands than broadcast seedings after second cultivation in late June or the first days in July. Better than average rainfall and distribution through July and early August were necessary for good stands and growth in these seedings.

With similar heavy population per acre, corn yields in 60-inch rows were about 5 to 8 percent less than in 40-inch rows. Eighty-inch rows lowered yields 10 to 21 percent.

Irrigation following seeding should greatly improve stand and growth of midsummer seedings.

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