Partridge Pea in a Stubble-Mulch System

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In the Great Plains area there is a distinct need for an annual legume that can be grown with other crops and that does not make extravagant demands on the soil moisture supply at a time when it is needed by those crops. It should furnish cover, add fertility, and produce a good yield of seed that will mature before frost. The seed should have the ability to germinate and come as a volunteer crop the next year. Several legume crops have been grown in the stubble-mulch system. When soil is non-inverted, as in subsurface tillage, the seed is not buried so deeply as when the land is plowed. Hence, these legumes may not need to be reseeded, but possibly can be depended on to volunteer regularly. It is the purpose of this paper to give a progress report on the performance of partridge pea, *Chamaecrista fasciculata* (Michx.), when employed in a stubble-mulch system as a regularly occurring legume.

DESCRIPTION OF THE PLANT

Partridge pea is an erect plant, 1 to 3 feet in height. It bears yellow flowers which are somewhat irregular and about 1 inch in diameter. The uppermost flower-bearing branches are fused with the stem, while the lower branches are usually axillary. Seed pods are about 2.5 inches long and flat, and the ripe seeds are black and flat, with rhomboidal faces of about 1/2 inch maximum dimension. The leaves are pinnately compound and slightly sensitive to the touch. Partridge pea grows naturally in dense stands and bacterial nodules are borne abundantly on the roots.

Partridge pea occurs from Massachusetts to Florida and west to South Dakota, Wyoming, and New Mexico. It is indigenous to our midwestern virgin grasslands and it invades waste or undisturbed areas like field borders, roadsides, or railroad embankments. Ordinarily it is not found in cultivated fields. It is either killed by cultivation before it produces seed, or the buried seed fails to germinate.

GROWTH HABITS

Partridge pea germinates later in the spring than other common legumes. At Lincoln, comparing volunteer emergences, it germinates about 3 weeks later than vetch, or annual or biennial sweetclover, and hardly at all prior to seedbed preparation for oats. Planted with oats, it does not emerge until the grain crop is 4 to 6 inches high. Under adverse conditions plants may continue to come until midsummer. There is no germination whatever in the fall. It withstands the competition of growing wheat or oats to an unusual degree. That is, it may stay alive, although it may not grow. Under favorable moisture conditions it grows erectly at an even height and spreads its leaves horizontally. Thus it may form a dense ground canopy beneath overtopping grain. Grain can be harvested with a binder without cutting into this canopy, but at the time of combine harvesting there may be some slight clipping. After grain is harvested, if moisture conditions are favorable, the plants make a vigorous growth. As a rule at Lincoln, they will be in full bloom by the middle of August and seed will be ready to harvest about the third week in September.

PLANTING

Partridge pea may be seeded with a spring grain such as barley or oats, or it may be broadcast at any time between fall and early spring on winter grain. The seeding may be done with any legume seed attachment such as those available for grain drills, after a test has shown that it will handle the partridge pea seed without cracking. A seeder mounted on a treader such as described elsewhere is very satisfactory in that the treader provides for coverage. Seed should not be covered deeper than 1/2 inch in heavy soils, or 1 inch in lighter soils. At Lincoln, the plots to be planted to annual legumes under the stubble-mulch system are subtilled and double-treaded and drilled to oats at the ordinary rate. Then the legumes are seeded and covered with the treader.

Scarification of the seed is necessary to assure a high percent germination. Fairly good stands have been obtained from planting 30 to 40 pounds of seed per acre. However, this is much higher than recommended by Atkins and Young for the southeastern states. One of the advantages of this legume is the fact that some seed will carry over in the soil for a considerable time before germinating. This increases the chances for it to volunteer successfully when the land is seeded to small grain. Seed must be inoculated, either with commercial cowpea inoculum, or preferably with soil on which partridge peas have recently been grown.