STICKTIGHT

(Lappula echinata)

Sticktight was introduced from Europe and Asia and is now widespread in the United States. It is found growing commonly in dry or sandy soil near roadsides, wooded areas, fencerows, and in industrial waste areas.

L. echinata is classed as an annual or winter annual and reproduces by seeds only. Other common names for this species include blue stickseed, burweed, bluebur, and sheepbur.

Its root is a deeply penetrating taproot type with numerous lateral branches.

Stems (4) are rough and covered with short, white, fine hairs. These give the stalk a grayish appearance. The slender stem grows erect from 1 to 2 feet tall and branches widely at the top.

Leaves grow alternately from the stem and are also covered with soft white hairs. In the mature plant, leaves are from 1 to 2 inches long and from 1/16 to 3/16 inches wide. Young plants show a rosette form (3) of leaves which spread near the crown at ground level. Seedlings (1) have only 2 leaves.

Flowers are small and have 5 blue petals. They are borne in the leafy tips and leaf axils (7) of the upper branches of the plant. This plant generally blooms during June and July.

Seeds (5) are produced in nutlet form by four-lobed, female flowers. At maturity, the spiny flower splits into four segments (2), each composed of one burry nutlet seed. Each seed is about 1/8 inch long, grayishbrown, and has a narrow scar (6) along one side. Seeds are unsymmetrically pearshaped overall with a double row of barbed spines on each side. The spined nutlets readily stick to animal hair or human clothing, and thus seeds sometimes are carried great distances to new sites. Plants are seldom eaten by livestock. It has a disagreeable odor.

Sticktight can be effectively controlled by closely mowing the plants before seed matures. It does not survive under cultivation. In the autumn or early spring, young rosettes should be cut below the crown at ground level. If sprayed before bloom 1/2 to 3/4 pound of 2,4-D per acre will control this weed.

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the rim speed and design of the impeller. They should always be operated at the recommended RPM; when we increase the speed one-third, the horsepower requirements are more than doubled.

The vertical or turbine pump has performance characteristics very similar to those of centrifugal pumps since they both operate under the centrifugal principle. Turbines, however, cannot operate at a high efficiency over the wide range of conditions that horizontal centrifugal pumps can.

Consider Pump Efficiency

Pumping at a rate of 450 GPM will deliver approximately one inch of water on one acre in one hour (one acre-inch). Thus, for a water requirement of one-half of an acre-inch per hour, a flow of ½ × 450 or 225 GPM is needed.

The efficiency of a pump is very important. Consider a 40-acre permanent system where the field is to be irrigated in quadrants, and the pump required is to have a 450-GPM output at a 250-foot TDH. If we select a pump with 70% efficiency, the horsepower requirements are 40 continuous brake-horsepower (c.b.h.p.). In the same situation, if we are careful and choose a pump with an efficiency of 83%, the horsepower required is reduced to 35. Operating 720 hours annually (9 irrigations each at 0.15-inch per hour), using an LP-gas engine with fuel at 12¢ per gallon, the annual fuel savings, alone, is approximately $100. This results by using the most efficient pump, and there are additional savings by purchasing the smaller motor.

Selection of an irrigation system should be based on all factors concerned. Determination of the soil moisture conditions, uniformity of application, sprinkler spacings, and both fixed and operational costs should be based upon current research and on good engineering concepts tempered by local field experience.