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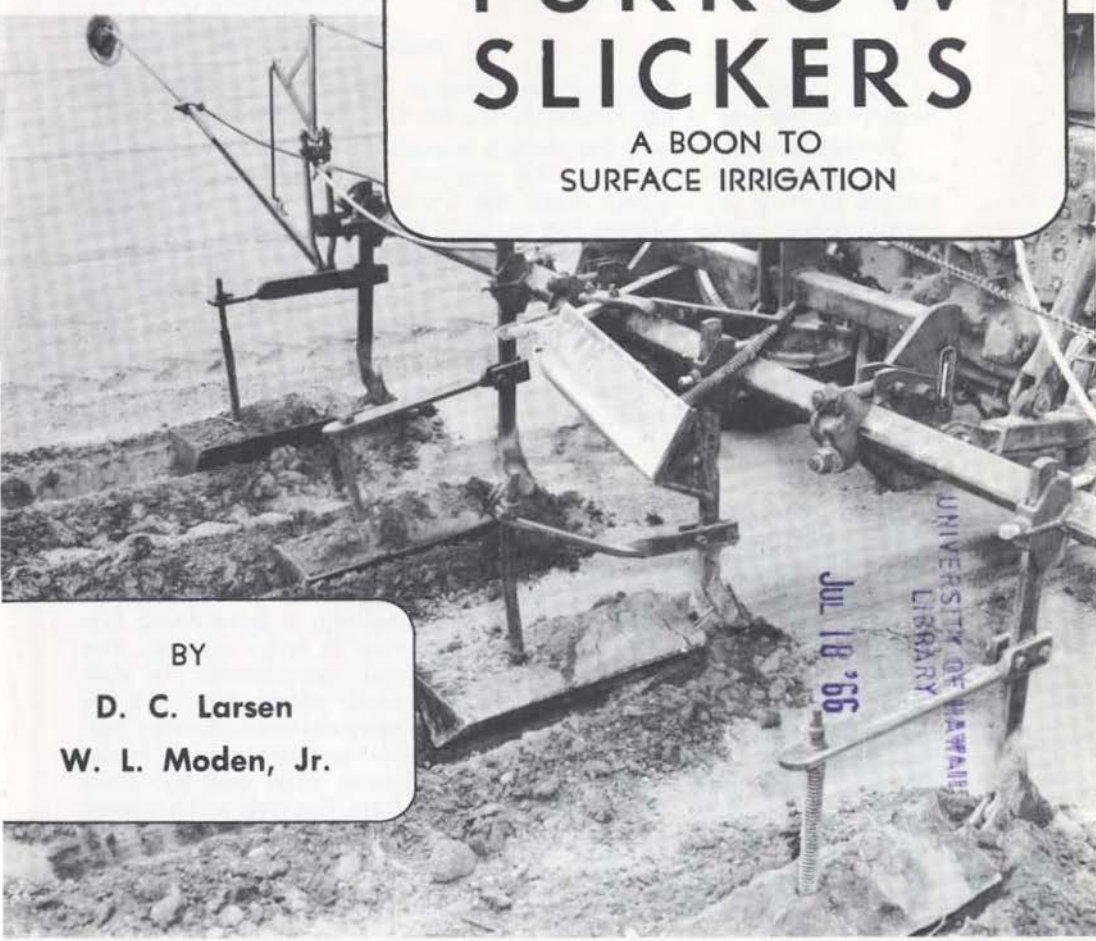
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FURROW SLICKERS

A BOON TO
 SURFACE IRRIGATION



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FURROW SLICKERS

A BOON TO
SURFACE IRRIGATION

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How many times have you wondered if the water would ever get through to the end of the furrow during the first irrigation?

Furrow slicking speeds the water's movement down the furrow and solves other problems as well. The irrigator can apply light, early irrigations as they are needed. Since the water moves down the smooth furrow faster, longer furrows can be used to save time and labor—and stretch water. Slopes become more manageable—easier to irrigate. Water is distributed more uniformly over the field, improving crop yields and quality.

FIRST IRRIGATION

Plant moisture requirements are critical early in the growing season. Lack of moisture can materially reduce the yield and quality of potatoes and sugar beets and other crops—besides delaying maturity of snap beans.



Figure 1. A slick furrow will carry a small stream quickly. A 6- to 8-inch furrow is large enough. The soil temperature in flat, wide potato hills will be more uniform, allowing better quality control, fewer green ends, and less field frost. The crop will not need irrigation as often. The narrow furrow will be bridged by the foliage and the problem of getting water through during late irrigations will be eased.



Figure 2. The field is marked out and corrugated for irrigation before planting beans. The marker is followed easily by the tractor. Slick furrows allow a light, uniform application of water. A light irrigation permits the soil to be worked sooner and an earlier planting.

As the young plant grows and the root system develops, early moisture needs are met from the adjacent soil. All that is needed at the first irrigation is a light application to replace the moisture in the top 6 to 12 inches, depending upon the type of plant.

LIGHT APPLICATION DIFFICULT

Good seedbed preparation provides a loose, mellow soil. Alternating freezing and thawing cycles may have loosened the soil. Intake rate is likely higher than at any other time during the irrigation season.

Furrows have to be kept small to prevent covering the young plants. Furrow stream size is limited on steep land by risk of soil erosion; on flat land, by the amount of water a small furrow can carry.

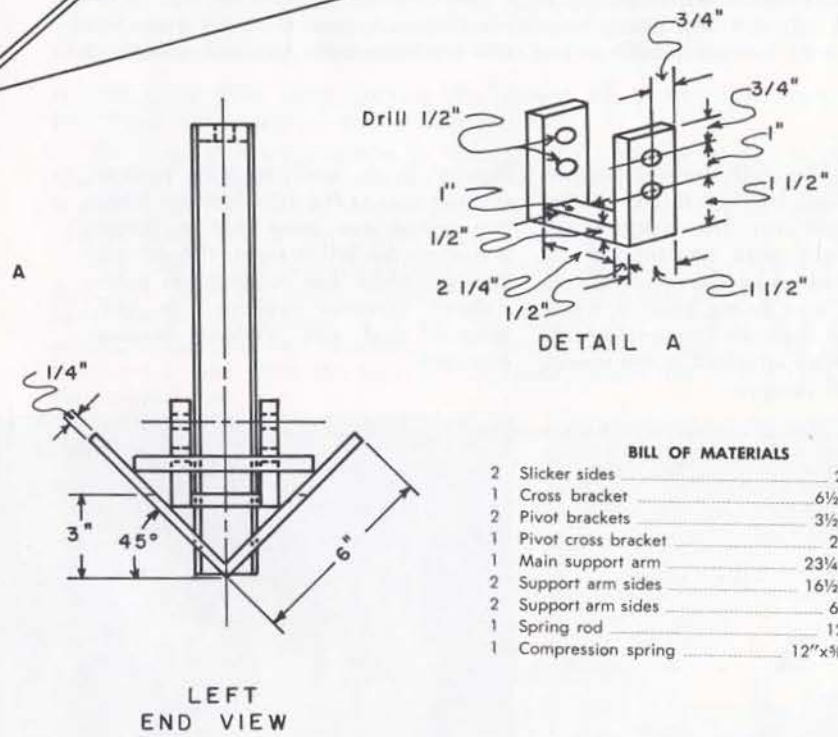
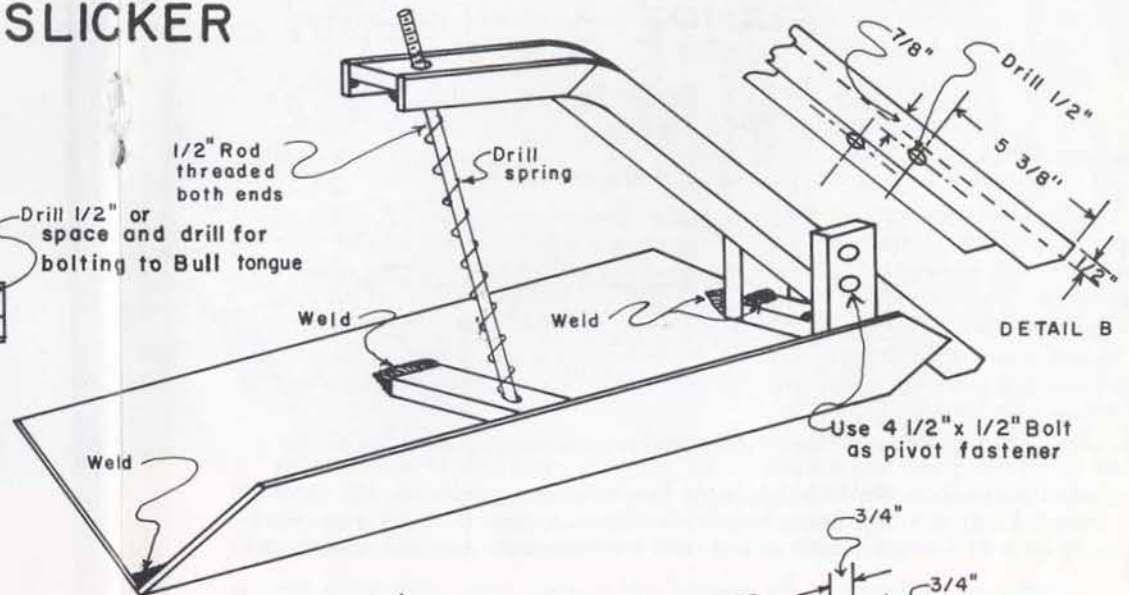
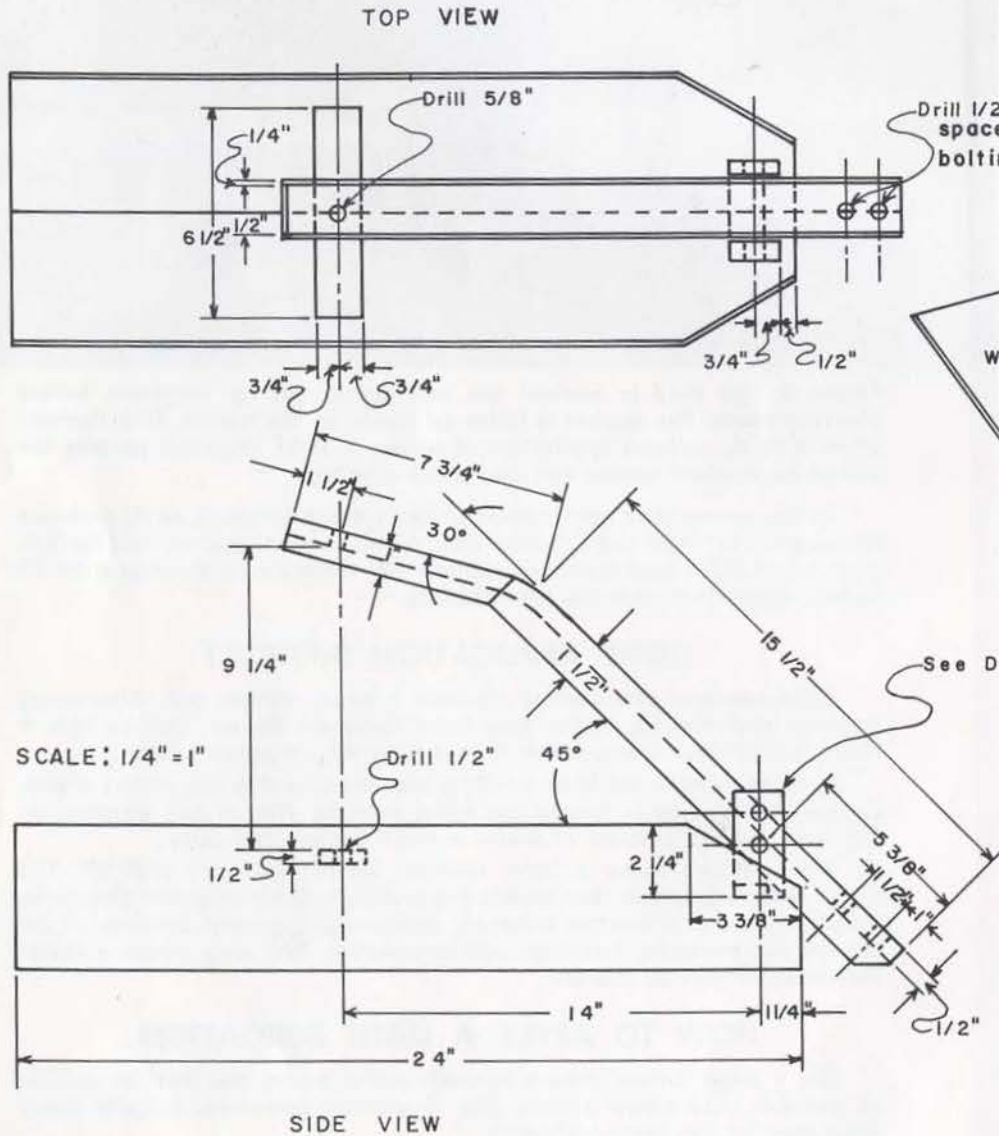
These factors make a light, uniform application very difficult. The demand for a long run compounds the problem. Over-irrigation should be avoided because it leaches nitrogen; delays plant growth because of excessive soil moisture; increases soil compaction; and may create a favorable environment for disease.

HOW TO APPLY A LIGHT IRRIGATION

Use a large furrow stream to push water across the field as quickly as possible. Cut down stream size if erosion threatens. Irrigate every other row for the first application.

Use a furrow slicker to make a smooth slick furrow which will carry water across the field faster.

FIGURE 3. FURROW SLICKER



BILL OF MATERIALS

2	Slicker sides	24" x 1/4" x 6"
1	Cross bracket	6 1/2" x 1 1/2" x 1/2"
2	Pivot brackets	3 1/2" x 1 1/2" x 1/2"
1	Pivot cross bracket	2 1/4" x 1" x 1/2"
1	Main support arm	23 1/4" x 1 1/2" x 1/2"
2	Support arm sides	16 1/2" x 1 1/2" x 1/4"
2	Support arm sides	6 3/4" x 1" x 1/4"
1	Spring rod	12" x 1/2" dia.
1	Compression spring	12" x 3/8" I.D. dia.

WHAT IS A FURROW SLICKER

A furrow slicker consists of two parts, a furrow opener and a slicker. The opener consists of a heavy steel shank and a bull tongue. The slicker consists of a 24-inch metal V-drag with a spring load on it to press and pulverize the soil, and give the necessary skin compaction.

HOW TO USE A FURROW SLICKER

The furrow slicker is mounted upon a tool bar behind the tractor as shown on the front cover. Some are for three rows, some for five. Every row should be slicked as it is cultivated.

Two key factors in building a good, slick furrow are soil moisture and a clod-free, loose soil. Many irrigators create a loose soil in their regular cultivation practices. They position their tools in front of the slickers in the best manner within their experience to control weeds and to provide a loose, clodless flowing soil as the furrow slickers advance, Figure 6.

The soil should contain enough moisture that clods break up readily and the soil is friable when worked. A moist, mellow soil will set up and form a slick furrow, Figure 2.

Achieving a desirable furrow is more than just hanging a slicker on the tool bar. Timing and adjustment of the tool are important. If you have an adjustable shank, adjust the angle of the bull tongue and slicker until it does the job. A firm, spring tension is required. Look at the furrow. It should be well formed, clod-free and with banks smooth and almost shiny.

Figure 4. The left furrow slicker has a 1½-inch by ½-inch bar as the main support arm. The support arm on the right was constructed of built-up channel as shown in Figure 3, and the one being held is made from 2-inch channel. The arrow indicates the wing attached to the shank by the bull tongue.

Figure 5. A bull tongue furrow opener makes the first furrow. Note the wings are bent out to throw soil upon the hill to cover the young, pesky weeds. For subsequent cultivations farmers remove the bull tongue and use various furrow openers.





Figure 6. The assortment of cultivator tools ahead of the slickers controls weeds, and provides a loose, clodless, free-flowing soil for the furrow slickers. The furrows are re-slicked after each cultivation.

A little extra time spent getting the correct adjustment will save irrigation hours and water at this critical period.

On close-growing crops with corrugations no advance tool is needed. The spring tension forces the V-drag down tightly so that very little area is disturbed. The soil is pressed out from the sides of the furrow. In the case of grain, few of the tender plants are uprooted.

The bull tongue usually is used to make the furrow for the first irrigation after planting. Some irrigators use various kinds of shovels to help open the furrow (Figure 5) to get the desired hill shape, and to control weeds in succeeding irrigations. The furrow slickers are used to re-build the furrow each time the land is cultivated unless the intake rate of the soil is very low.

A soil compaction problem has been found in some potato fields and this could apply to other row crops. Wet springs, delayed planting, weed control, and large tractors together with a damp soil have created compacted soil layers. A furrow removes the support from under the middle of the tire and places the load on the shoulder of a potato hill. When this happens the soil should be loosened and made as mellow as possible. This can be done without hurting the irrigation works when furrow slickers are used to reestablish the furrow.

Which Type Is Best

The illustrations show several types and sizes. A larger one is needed for potatoes than sugar beets and beans. This will work just as effectively in the other crops. The V-slicker should be at least 24 inches long. It may be extended to 30 inches.

Spring-loaded type is gaining in popularity in the Magic Valley where slickers have been used for several years. Observations show it will do a better job under varied soil conditions. If the soil is hard or quite cloddy, it will do by far the best job.

How to Build a Spring-Loaded Furrow Slicker

Details for the construction of a furrow slicker are shown in Figure 3 (drawing). The main support arm of the furrow slicker was designed as a built-up channel to obtain maximum resistance to bending and still maintain light weight. Bending of a 1½-inch by ½-inch bar member has been experienced when the furrow slicker has been used under severe soil conditions. Under normal conditions, a 2-inch by 1-inch by 3/16-inch commercial channel, being held in Figure 4, can be constructed to replace the built-up channel by using the same length and hole dimensions shown in the drawing.

If greater strength is needed, the 2-inch commercial channel can be boxed with a 1½-inch by 3/16-inch flat bar. The 2-inch commercial channel has twice the bending strength of the 1½-inch by ½-inch bar. In contrast, the built-up channel has more than twice the bending strength of the commercial channel. The selection of the construction technique of the main support arm should, therefore, be made to correspond to the soil conditions under which the furrow slicker will be used. A support arm constructed of 2-inch commercial channel should be satisfactory for most soils.

The V-drag pivots freely at the front of the main support as shown in Figure 4. The spring can be tightened to get the desired tension on the slicker. The bottom of the V-drag should be level with the bottom point of the bull tongue.

Figure 4 shows the wing used to throw soil against the plants to cover up the small weeds. Excess soil is prevented from falling back into the furrow. Wing size is 4 inches by 15 inches by ⅛ inch.