A REPORT FROM CALIFORNIA-OREGON ON MECHANIZED EQUIPMENT FOR STAKING AND STRINGING OPERATIONS IN BEANS AND TOMATOES

JIM REAR
Rear's Farm Service
Eugene, Oregon

Recent changes in wage scales, materials costs, and other items, have all forced growers of high labor crops to take second looks at their production costs. Very few common crops require as much hand labor as the two mentioned in our title. Because of the vast amount of materials needed to erect an acre of staked tomatoes or beans, it has been necessary to use whatever materials were near at hand in abundance.

In Oregon, where several thousand acres of Blue Lake beans are produced every year, there are fortunately located adjacent to every community, a large supply of edgings, highly suitable for use in trellis erection. If there is a standard in the industry, it probably is for a 2 x 2 stake 7 feet long, pressed into the ground about 12". These stakes lend themselves ideally to mechanical pressing, their uniformity of size, low cost, strength, and keeping qualities make them the logical choice of growers everywhere.

Stake pressing mechanically, is affected largely by soil type, moisture content, row spacing and yard height. If the soils are gravelly, it will be necessary to pound them rather than press them. The pressing method is quicker, easier on the stakes and takes a less expensive machine.

Most growers in the West now use hydraulic presses of the type illustrated by accompanying slides. It takes as little as five acres of beans to justify ownership of such machines. The one-row models will press about 5 stakes a minute under average conditions. This will make about one-half acre per hour where 700 stakes per acre are used. The rows are on 5-foot centers, 6-foot high and stakes are placed 15' apart in the row. To string the beans to this it is becoming common practice now to use a trellis machine that will put up a top wire of 12-gauge, tighten it, and likewise a bottom paper string of sufficient strength to pull about 70 pounds of pull. This is parallel to the wire and about 6 inches off the ground. Between these two units is wrapped simultaneously a series of vertical strings to support the vines in their effort to reach the top wire. These are cotton strings of 4-ply size. On the above type bean yard they will use about 30 pounds of paper string and 18 pounds of cotton string per acre. A staple gun is used by the operators to secure the top and bottom members to the existing stakes.

The machine for the operation is a ground driven unit pulled by a tractor narrow enough to pass between the posts and powerful enough to pull the unit. 5 or 10 h.p. is enough. On the front of the tractor they use a wire spooler that keeps the wire at the proper tautness to make unwinding smooth and free of jerking. This may be adjusted by changing a tension device provided. The diameter of the wire rolls can be allowed for by a telescoping feature going from 10 to 18 inches in diameter. The wire passes through a tightening device on the stringer that takes sag out of the material and makes a steady pull while stapling. With adjustments on the conveying speed of the cotton string carriers, the user can change their spacing from 6 or 8 inches to 15" or more.

Other adjustments are provided for the several other factors affecting the trellis characteristics. The forward speed of the stringer will vary, however, about 2 or 3 miles per hour are not uncommon; with Oregon bean yard dimensions it amounts to about one-half acre per hour. Slots in the top of the 2 x 2 stakes instead of stapling will increase this speed, where such slots are permissible due to terrain, stake type etc. This procedure is modified in other areas to suit weather conditions, vine growth etc. The other extreme being Indio, California, with 36" rows, 4' height and 8' stake spacing.

A new machine now is being used that will lift the wires from the stakes, beat off the vines with vibration, and wrap up the wires. A stake puller that will pull up stakes of varying sizes may be used simultaneously to take
a whole yard in one operation. These are fairly inexpensive units and pay for themselves on modest acreages. Joint ownership is not uncommon.

Another trellis method is the use of a forest of 1 x 1 stakes placed at intervals of 18" using a roll type stake press that rolls a continuous stream of stakes at pre-determined depth without stopping the tractor. This machine will do about 3 acres per day on rows the same as for the above string method. It is easy on pegs and easy to operate. As the operator crosses the field he is all through erection and needs only to run a top string between stakes to unite them. A companion for this unit is the stake puller with integral hopper to catch the stakes as they are rolled from the ground and accumulate them to the end of the row where they are unloaded for storage. With this method growers of as little as 10 acres have been able to justify ownership with labor saved.

Modifications of this machine are now being introduced to California Tomato areas for putting in 1 x 1 and 1 x 2 stakes at 48" intervals for vine support. The growers run wires parallel to the row to unite the stakes then use additional string horizontally to hold the vines as they grow progressively taller. Stake pullers also fit into this operation ideally, pulling the large end stakes and the smaller intermediate ones with equal ease.

Because of the lack of uniformity of methods on the trellis erection, tomato staking has not as yet progressed to the point that bean trellising has in the West. It is quite likely that it will succumb to mechanical efforts soon however, since the labor requirements are much larger. It is definitely proven that many of the practices connected with tomato trellising are done more from tradition than from scientific necessity. Uniformity of practice will make machines perform very well under all conditions where soil and other factors permit their use.

No problem employing hand labor cannot be done by machine, it just depends on the economics involved. However, after considering all the factors surrounding many of our current hand labor jobs, we must admit that we have gone a long way around on solving the riddle. Let's all use some cogs and a wheel where it's a good deal; let men quit competing for jobs reserved for mules and jack asses and get up off our knees long enough to find a job more worthy of our talents.

PANEL—"PINK TOMATO DEAL"

F. S. Jamison, Moderator
Agricultural Experiment Station
Gainesville

Special Reports
J. M. Walter
Gulf Coast Experiment Station
Bradenton

L. H. Halsey
Agricultural Experiment Station
Gainesville

Guest Panelists
Clark Powell
Ruskin

Lewis Rauth
Delray Beach

Buck Carlton
W. Palm Beach

Dave Kelbert
Bradenton

Dr. Jamison: The "Pink Tomato Deal" is a very interesting subject for several reasons. We all know that tomatoes are one of the big crops in the State. In most years, there were only two other crops which exceeded tomatoes — oranges and grapefruit. In some years, tomatoes exceed grapefruit. Acreage has grown in recent years, that is, with green tomatoes. I think that any of us realize that the quality of tomatoes, both green and ripe are quite often unsatisfactory. Just what the consumption of tomatoes would be, if we could put high quality tomatoes on the markets of the United States during fall, winter, and spring months, I don't believe anyone could estimate, but certainly we know consumption would be very much higher than it is today.

Pink tomatoes, you might think of as a new deal in handling of tomatoes. It is interesting to me the impetus it has received in the past several seasons, because my first year in the State 21 years ago, I was holding a number