USE OF THE J. E. LOVE VACUUM SOWER

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Abstract: One of the first steps in seedling quality is proper planting by providing each seedling with optimum spacing. With this in mind, the Georgia Forestry Commission purchased a J. E. Love 816SL Vacuum Sower in 1988.

When using the vacuum sower, soil conditions play an important part. Care must be taken during site preparation to insure that very little stubble is left in the field. Seedlings or cover crops from the previous year will increase down time due to the need for more frequent cleaning. Stubble also tends to hang on various part of the sower which causes seeds to scatter. The need to remove the debris can occur often enough to slow the planting to such a speed that using the vacuum sower may become impractical to use.

Soil moisture plays an important role in the optimum operation intended of the vacuum sower. Too much moisture will cause soil to stick to the packing drum, furrow makers, and press wheels. The furrow makers tend to widen or deepen the furrows, and the press wheels will lift the layer of soil containing the seed. This will scatter the seeds and leave them uncovered. Even though very little can be done about too much moisture due to rain, dry soils can be irrigated prior to planting during dry periods. Without enough moisture, the sower will not make furrows. Dry soil will not allow the packing drum and press wheel to roll properly causing the soil to be pushed ahead of them.

Seed must be clean for use with the vacuum sower. Cone parts and needles will cause skips. Smaller pieces of trash will plug holes in the seed plates, also causing skips and making it necessary to clean the seed plates. An excessive amount of dye or aluminum power on the seed will quickly fowl the air filter causing a drop in vacuum, which in turn, can cause a loss of accuracy.

The frequency with which the machine needs cleaning varys with soil conditions and the cleanliness of the seed. Under good conditions, cleaning may be needed only once per day; under worse conditions, cleaning may be needed several times daily. This is important since cleaning takes about 30 minutes with two people. To clean the sower, the eight seed hoppers must be removed to allow access to the sixteen seed plates. Holding the plate up to a light will show if any of the ninety holes in the plate are obstructed. When an obstruction is found, compressed air can be used to blow it out. Sometimes it will be necessary to use a toothpick to punch it out. Air can also be used to clean the plate of dust, and to blow out the air filter.

Calibration is quick and easy, due to the use of different sprocket sizes. Density is limited to the choices on the calibration chart due to the size of sprockets. This may be slightly higher or lower than the desired density. Wheel slippage must be considered when calibrating. Density can be as low as 18.75 seed/ft^2 to as high as 67 seed/ft^2 with the sprockets supplied with the sower. Seed counts should be taken periodically to insure proper seed density is maintained.

Production will vary from abour four to seven acres per ten hour day, depending upon down time from wet or dry soil conditions, need of cleaning, and seed lot sizes. Obviously, large seed lots will help raise production because of less often recalibration. The major reason for low production when compared to other sowers is the operating speed of 1 to 1 M.P.H. Under excellent conditions, it may be possible to speed up to 2 to 2 1/2 M.P.H.

The vacuum sower is much better suited to planting experimental plots than other sowers. By turning the drive wheels by hand, the seed plates can be preloaded, thereby, allowing immediate distribution of seed once the sower is put in motion. Immediately upon stopping the sower, seed distribution is ceased. Double sowing or large gaps on the beds between each plot is eliminated.

OBSERVATION	OOJIORD	PRECISION
Grade #1 seedlings (%)	21.5 a	27.3 a
Grade #2 seedlings (%)	49.1 a	47.9 a
Grade #3, culls (%)	29.4 a	24.8 a
Plantable seedlings(%)	70.6 a	75.2 a
Bed density (No./sq.ft.)	26.2 a	25.7 a
Shoot height (mm)	237.3 a	248.2 a
Shoot weight (g/tree)	10.4 a	12.0 a
Shoot weight (mg/mm)	43.8 a	48.1 a
Basal shoot diameter (mm)	3.9 a	4.0 a
Tap root length (mm)	132.7 a	159.7 b
Root weight (g/tree)	1.89 a	2.24 b
Root weight (mg/mm)	14.2 a	14.6 a
Seedling weight (g/tree)	12.3 a	14.2 a
PLANTABLE SEEDLINGS (NET/SQ.Fr.)	18.5 a	**19.3 a**
PLANTABLE SEEDLINGS (TOTAL/100 ACRES)	48,351,600	50,442,480
PLANTABLE SEEDLINGS (VALUE DIFFERENCE/100 ACRES)		$50,181.12

Paired means do not differ at 95% level when followed by a common **letter.**

STUDY RESULTS PROVIDED BY JIM ROWAN

PERCENT CULLS AT LIFTING

DENSITY (#/WSQ.FT)	LOVE (%)	PRECISION (%)	AVERAGE (%)
20.0	8.9	13.0	11.0
22.5	16.7	16.4	16.6
25.0	20.7	23.1	21.9
27.5	33.6	33.1	33.4
30.0	30.3	27.1	28.7
32.5	40.3	36.6	38.5
35.0	36.2	35.7	36.0
AVERAGE	26.7	26.4	26.6