
CIRCULAR METHOD OF SAMPLING AND MAPPING OPEN-FIELD PLOTS¹—(Note). In recent Florida surveys to determine population levels of the imported fire ant, *Solenopsis invicta* Buren, a method was developed to accurately and rapidly inventory ant mounds on 0.5A and 1A (0.405 ha) plots. This method is an adaptation of the plane table (H. F. McColly and J. W. Martin. 1955. Introduction to agricultural engineering. McGraw-Hill, Inc. 553p).

The plane table was constructed with readily obtainable parts as follows: (a) 26 in x 26 in x $\frac{1}{2}$ in exterior grade plywood, (b) metal yardstick, (c) $\frac{1}{2}$ in x 2 in galvanized bolt (sharpened to a point) with a flat washer and nut, (d) four $1\frac{1}{2}$ in floor flanges, (e) sixteen $\frac{3}{8}$ in x $1\frac{1}{2}$ in bolts with washers and nuts, (f) four $1\frac{1}{2}$ in x 3 in galvanized pipe 45° street ells, (g) four $1\frac{1}{2}$ in x 3 ft galvanized pipes threaded on 1 end, and (h) a 100 ft or 150 ft cloth rule or marked tape. Paper used to make each survey map can be cut from a roll of 24 in paper.

Drill four $\frac{3}{8}$ in holes in the plywood for each floor flange ca. 7 in from the intersection of diagonal lines drawn from corner to corner. Inset the $\frac{3}{8}$ in bolts on the top side of the plywood board and tighten the nuts to hold the flange on the underside of the table (Fig. 1A). Fill the bolt holes with plastic wood and sand to a smooth surface. Screw a street ell tightly into each floor flange and orient each street ell toward the near corner. Drill a $\frac{1}{2}$ in hole on the underside of the table (Fig. 1A). Fill the bolt holes with plastic the center of the table and insert the sharpened $\frac{1}{2}$ in x 2 in bolt from the underside to form the pivot pin for the alidade (metal yardstick). The alidade is made by brazing or brading a $\frac{1}{2}$ in flat washer onto the metal yardstick. Position the center of the washer at a line bisecting the leading edge of the ruler and the 0 in mark. Cut a slot into the other end of the yardstick for attachment of the tape.

Assemble the plane table by screwing the $1\frac{1}{2}$ in x 3 ft pipes into the street ells to form the legs, taping paper to the table, affixing the alidade onto the pivot pin with the nut, and attaching the tape to the alidade. The tape is attached at 3 ft to allow for the length of the yardstick. The radius or tape length of a 1A plot is $117\frac{3}{4}$ ft (35.9 m), a $\frac{1}{2}$ A plot is $83\frac{1}{3}$ ft (25.4 m), and a $\frac{1}{4}$ A plot is 58.91 ft (18 m). If the metric system is used, the radius for a $\frac{1}{2}$ -ha plot is 39.9 m (130.9 ft), a $\frac{1}{4}$ -hectare plot is 28.21 m (92.6 ft), and $\frac{1}{8}$ -hectare plot is 19.95 m (65.4 ft).

Place the assembled plane table at the centerpoint of the area to be surveyed. Orient the table with a compass and mark magnetic north on the paper. One person records data while another holds the tape taut and walks clockwise (or counter-clockwise) around the table. The surveyors divide the distance remaining and walk along the tape using it as a position guide (Fig. 1B). The tape is held directly over a mound when 1 is located; the distance is read from the tape and called to the recorder along with other pertinent data such as the dimensions of the mound and activity levels (Fig. 1C-D). All data are recorded on the sheet at a ratio of 1:10. The time required for 3 people to survey or inventory fire ant mounds averaged 7 min for thirty-four $\frac{1}{2}$ A plots sampled.

For our fire ant surveys, the plots are mapped to show location and size of mounds. A stake is placed to mark the center of the plot so that compari-

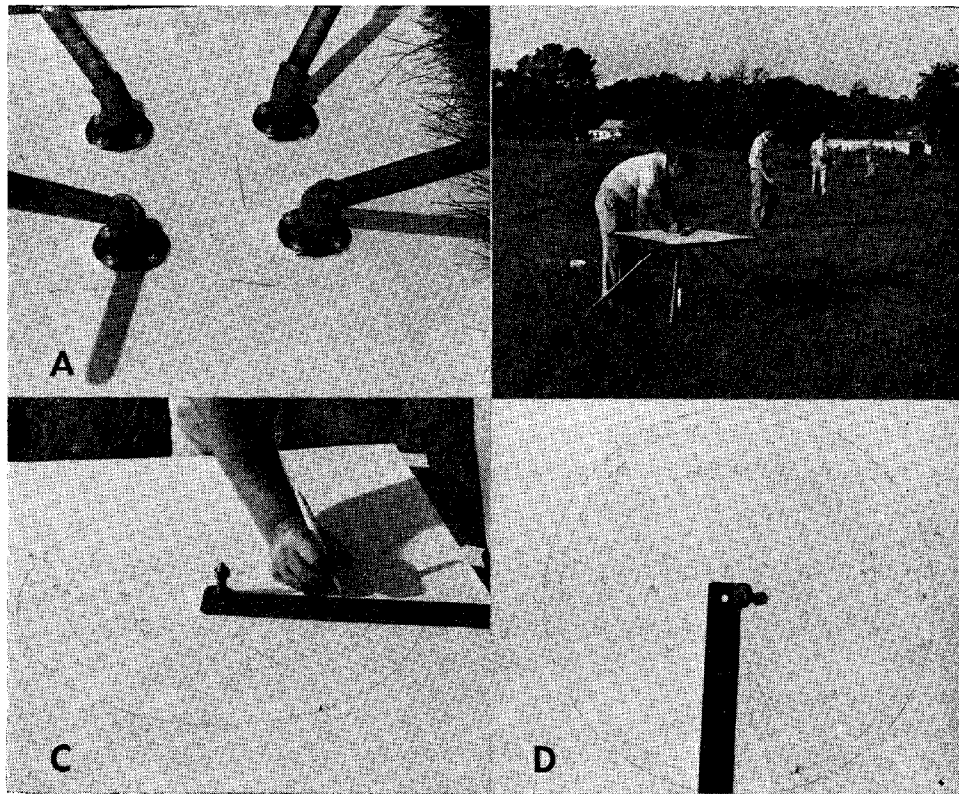


Fig. 1. A) Floor flanges and 45° street ells on the underside of the 26 in x 26 in piece of ½ in plywood. B) Using the modified plane table to survey and record imported fire ant mounds. C) Marking the location of imported fire ant mounds. D) Completed map of fire ant locations in a 1A plot in a pasture.

son by later surveys is possible.

The plane table may be eliminated if a map of the area is not required. A sharpened rod ca. 5 ft long is driven into the ground, and a floating cap with an attachment point for the tape is placed over the rod. With the floating cap in place, a survey may be conducted as with the plane table and mounds tabulated as they are located.

These methods are potentially useful for taking inventory or mapping an area for investigations where exact locations are required of such natural phenomena as ant mounds, plant species, or plant communities.—R. E. BROWN AND J. C. NICKERSON, Bureau of Methods Development, Division of Plant Industry, Florida Department of Agriculture and Consumer Services, Gainesville, FL 32602, and C. H. GADDIS, JR., USDA, APHIS, PPQ, American Embassy, Guatemala, APO, Miami, FL 34024.

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