RESEARCH NOTES

Graphic Techniques for Illustrating Distribution Data

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Density mapping techniques have been used to illustrate the horizontal distribution of several nematode populations in a field (1,2). These illustrations aid in interpretation of nematode distributions, interactions between populations, and edaphic and cultural influences.

The amount of data obtained from a nematode distribution study in an alfalfa field suggested the use of automated or computerized mapping (3). In geography and earth sciences, problems of handling a large number of data points to produce an overall picture in large scale mapping have led to the development of autocartographical techniques. A clearing house for such programs exists at Michigan State University,* but the programs reported herein are commercially available only.**

Three programs were used to illustrate nematode distributions. Two were 2-dimensional with density classes shaded to contrast differences, and the other was a 3-dimensional map which plotted the densities as heights. The programs were implemented on an IBM 360 computer and had similar data input requirements. The counts for each sample site were standardized to nematodes/200 g and entered as a 44 × 44 matrix reflecting their field locations. Each program defined symbols or coordinates to represent the population at each core site, and finally printed the distribution of densities. The examples provided represent the horizontal distribution of *Helicotylenchus digonicus* Perry.

The first program utilized was Grid, a cell mapping program. It uses a line printer output and produces a map which contrasts the density differences by shading; the darker the print, the denser the population. The shading is produced by overprinting standard symbols and characters. The user specifies the shadings to be used and defines density class limits (Fig. 1).

A variation on Grid is Grid-plot. Instead of the shading being accomplished by overprint on a line-printer, a pen-plotter such as Cal-Comp or Dell Foster is used. Better contrast between density classes is achieved (Fig. 2).

The final program used was Views. This program produced a 3-dimensional map representing the individual core site densities as peaks proportional to the maximum value in the field. The map is produced on a pen plotter. An advantage of this program

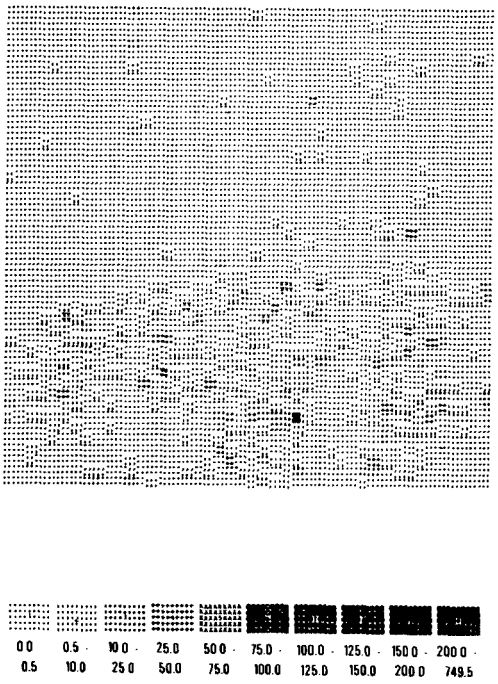

Fig. 1. Example of computer mapping program Grid, illustrating horizontal density distribution of H. digonicus, nematodes/200 g soil.

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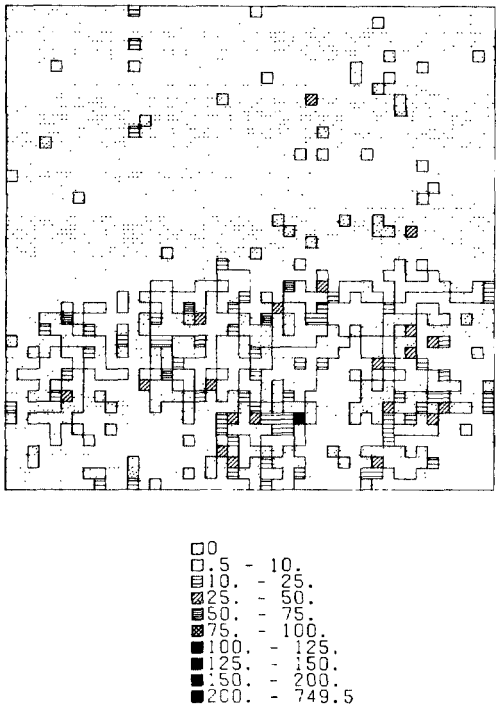

Fig. 2. Example of computer mapping program Grid-plot. Each cell represents 36 m², nematodes/200 g soil.

is that density classes are not used, but each site is individually represented. The user

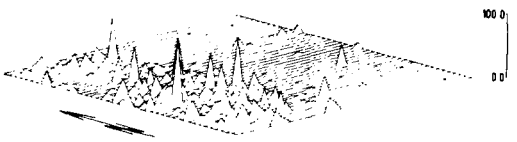

Fig. 3. Example of 3 dimensional computer mapping program Views. Peaks proportional to density of an individual core, nematodes/200 g soil. Each peak represents 36 m².

can define the altitude and the angle from which the plot is viewed, and the maximum height of the peaks. The program allows easy evaluation of any associations or population gradations, but lower populations may be hidden from view behind peaks in the foreground (Fig. 3).

LITERATURE CITED

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