

A METHOD TO MEASURE THE PERCENTAGE ATTACK OF ORGANISMS IN THE FIELD

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To gain a more than casual idea of the effect that biological control organisms have on plant populations it is necessary to measure the percentage of attacked plants and the dispersion of the organisms in nature, in relation to plant density.

The classical quadrat method is time-consuming and involves too many technical staff, especially if there is a large number of sites (and this cannot be avoided when a statistical interpretation of the results is required) and if the sites are far away from the home base. The method in use at the *Chondrilla* Biological Control Unit is in effect a line transect and is based on "The Line Analysis Method" (G. Long) and "The Three-step method" (K.W. Parker).

Method

The material used consists of 5 sets of stakes holding a 100 metre ruler. The line is set up at a height varying from 20 cms. to 1 m. according to the phenological stage of the species present. The placing of the transect is very important and can be based on the homogeneity of the distribution of the weed to be studied, on the topographical conditions of the site, by a random choice of a diagonal or by successively passing through dense patches of the plant or of attacking organisms, depending on one's requirements.

Once the line is set up and if a permanent line is required, small wooden pegs can be put underneath the line at the points 0, 25, 50, 75 and 100 as landmarks to facilitate its placing on other occasions.

When the surface to be studied is very large or the homogeneity of the field is not satisfactory, 2 or 3 line transects can be placed on different parts of the site in order to cover all the zones present. The length of the line can be reduced to 50 or even 20 metres, also depending on one's requirements.

The transect itself is in our case 20 cms. wide and is observed by moving a 1 metre stick holding a rectangle

20 cm. x 1 cm. along the line from the zero point to 100. Every time the central bud of the plant studied (*Chondrilla*) is met with, in the surface delimited by the rectangle, it is recorded as being present and examined to determine if the organisms are present or not. At the end of the observations the surface covered is 20 m². The density and the percentage of attack are automatically given by dividing by 20 and by the total number of plants depending on plant density and abundance of the organisms studied. The transect width can be varied. The Unit has on occasions used widths of 10 cms. and 50 cms. as well as the usual 20 cms.

Initially the method has been used to make measurements several times a year of plant density and percentages of infestation by the various *Chondrilla juncea* organisms. Recently it has been modified to follow the survival in the field of marked plants attacked by *Puccinia chondrillina* and marked unattacked plants within a fixed transect visited six times a year.

The method is easily used in roadside situations in which the plants are essentially linearly distributed and where so many species of weeds occur.

Advantages of the method

1. The use of this method three or four times a year gives an accurate account of the development and population changes of the plant and the organisms which attack it in relation to the season, the climate, etc.
2. The short time involved in making the measurements permits an increase in the number of sites to be examined in a given period of time (a complete line of 100 metres takes about 1½ to 2 hours).
3. If a phyto-sociological analysis is required, the same line transect can be utilised and, with a pin, 100 readings (one every metre) of plant and soil cover can easily be made.

References

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