UNIT OF QUANTITATIVE STUDY OF WEED FLORA ON ARABLE LANDS

B. N. SINGH AND G. V. CHALAM

Of late, the size and the form of unit that should yield a correct estimate of the nature of dispersion of species in quantitative ecology has been subjected to critical analysis by various schools of ecologists. Until now, however, little attention seems to have been directed toward studying the statistical nature of the distribution of weed flora on arable land. As such, the selection of the right form and size of unit which would give a correct estimate of the dispersion and density of the floral composition of the weeds on arable land becomes essential. In a uniform environment of the cultivated field, the factors of chance and random distribution are at their minimum, and as such, with the selection of a correct unit, a closer agreement may be brought about between the theoretical probability of distribution and the actual field data.

Arrhenius (~) investigated the relation between the size of the quadrat and the average number of species found in the quadrat; but as is evident from his curves he obtained the relationship between the size of the quadrat and the average number of the species found in it by taking quadrats of a single size and form only, though in a large number, and subsequently grouping the random quadrats for the desired size. By this method he makes a theoretical assumption that there is a random distribution of the species which may be far from the reality of field data. To make up for the shortcomings of the above method, Gleason (3, 4) grouped the “contiguous” quadrats. But as the curves show, such a method also failed to give coherent results with the observed field data. Clapham (2), investigating the form of observational unit in quantitative ecology, claims that the strip form of unit is more efficient than the quadrat. His contention is that from the point-to-point variability of the floral composition, due to numerous causal factors such as soil heterogeneity, the common gregarious and the rare solitary types of species, depending upon the probable chances of propagule dissemination, and the differences of the average area covered by the individual plants of different species, is minimized to a greater extent in a strip than in a quadrat. This assumption of the random distribution of species may be correct in the natural formation of vegetation, but it does not seem to be a correct assumption for the quantitative nature of weed species mosaic on arable land.

EXPERIMENTAL

During the investigations described here the quantitative nature of the weed flora on the arable land at the Benares Institute of Agricultural Research was determined, comparing the relative efficiency

1Contribution from the Institute of Agricultural Research, Benares, Hindu University, Benares, India. Received for publication April 25, 1936.
2Kapurthala Professor of Plant Physiology and Agricultural Botany and Head of the Institute, and graduate student, respectively.
3Figures in parenthesis refer to “Literature Cited”, p. 561.