

The lure of statistics

Most low-external-input agriculture is fundamentally different in nature from the agriculture familiar to researchers. Much of it is associated with food rather than cash crop production and is based upon priorities and objectives very different from the commercial sector. Research for low-external-input systems needs to question some of the assumptions that have dominated cash crop thinking. One of these is the importance of statistics.

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An important factor influencing much research is the professional status given to research and the way that status is maintained (Chambers 1986). It is generally recognised that low resource agriculture does not easily lead to high scientific recognition. The pressure is on researchers to embark on lines of study which will result in the publication of papers of sufficient scientific merit to further their professional career. The papers are written for the scientific world and almost invariably depend on statistics for substantiation. Mixed cropping and other practices associated with food crop systems are very difficult to analyse statistically, despite some complicated statistical methods, reducing their appeal to such researchers.

Magical power of numbers

Statistics are neutral, but can have effects which are not themselves neutral. The orderliness of statistics favours the simplicity of high-input cash crops over the great variability and complexity of most food crop systems. The order of statistics compares well with that obtainable in sole cropping with the precise spacings, timings and dosages so often accompanying cash crops. The innumerable variables that food crop farmers contend with do not lend themselves easily to statistics.

Statistics has a strong influence on agricultural research. It is like a mystical force that has given research stations power. In some cases this power has been maintained by ensuring that the almost magical power of numbers is not questioned. This can thus easily lead to manipulation, whether deliberate or just misguided.

Statistical Analysis is one of the major agricultural tools in what Chambers has termed "Normal Professionalism" or "First Thinking" (Chambers 1986). Normal Professionalism is a term that reflects the forces within a profession which tends to draw all practitioners in the same general directions. In agricultural research this is reflected in the importance given to statistical results, the assumption that crops

should be grown in pure stands, so normally line planted with precise spacing. The food crop farmer is seen as "primitive" or just not understandable. It is a force that is strong in most agricultural disciplines, but especially the higher status levels of research. It is certainly stronger than the relationship to people.

Experienced farmer's eye

In traditional societies, although people may be numerate, measurements are not considered as precise a determinant of practice as hard won experience. The experienced farmer determines the state of regeneration of a fallow, for example, not by the number of years it has been fallow, but by the state of the vegetation. The condition of a crop and the plant density can be determined efficiently by an experienced eye so that observation of the crop can be an accurate indicator of yield. Cropped areas are frequently not of regular shape but cultivated in such a way as to make best use of beneficial ecological niches and avoid poor areas. These irregular fields are difficult to measure and effective management of them does not depend on numbers. Weights are a foreign measure to many traditional cultures. Where yields or seed inputs are measured they are often calculated by volume. Distances may be measured using bodily measures similar to the English cubit or pace, but these are frequently not significant. For example, the distance to a field is more practically measured in terms of the time taken to reach it.

Other important factors such as output per unit of labour are difficult to measure, but the experienced farmer has very clear ideas of the labour needs of each activity, survival depending on accurate assessment. Labour itself has different qualities in relation to demand (Bunch 1982), that has no numerical value. Extra labour required

at a bottleneck season is of more value than labour needed at a slacker period. All these factors are anathema to the normal professionalism that attributes very high status to statistics and quantitative analysis, but low status to qualitative factors, which actually need far greater skill to use.

Analysis and experimentation

Complicated statistical analyses have been developed to analyse very small increments in yield and to determine whether they are significant. This is important for the profits of a commercial farmer dependent on expensive inputs. For the food crop farmer, the yield increment is of no interest unless it is significant enough to be seen. This judgement is quite adequate for determining whether to change to a new variety or not. Any measures used to try and make research more applicable to the farmers' field are moves towards developing more relevant information. It is still often necessary to make a break from cash crop thinking which depends heavily on statistical analysis. A major shortfall in many attempts to understand farmers' field conditions is that they depend on methods of analysis from the scientific culture and tend to ignore the farmers' own analysis, if outside this scientific mould. It is important to realise that Indigenous Knowledge is neither static nor fossilised, and that many significant changes take place in the farmers' field, even if they are difficult to measure. Farmers' Knowledge changes in response to analysis that may be qualitative but no less real for being so.

Many traditional farmers, often the women, have methodologies for on-farm experimentation and seed selection. These sometimes seem to be nebulous ideas of intuition. It would be more correct to say that they are based on observation and experience, which are skills as highly developed and no less reliable in the context as statistics for the research station scientist. Indigenous qualitative changes and the methods used are ignored at great cost by anyone seeking to relate to the low resource farmer. The experimentation itself must be recognised as valid even without statistical support, and may also be regarded as a field of great scientific value.

References

- Bunch, R. 1982. **Two Ears of Corn: A guide to people-centred agricultural improvement**. World Neighbours: Oklahoma City.
- Chambers, R. 1986. **Normal Professionalism, New Paradigms and Development**. Discussion Paper 227. IDS: Sussex.

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Photo: Roger Sharland

Mixed cropping near Moru homesteads in Sudan - not the easiest fields for statistical analysis.