The Journal of the Grassland of South Africa: Some reflections of a Referee

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Curiosity drives me to seek an explanation for the high rejection rate, and reflection has led me to the conclusion that there are three important factors, viz. the quality of the researchers, interaction between researchers and biometricians, and the structure of organisations involved in research.

The quality of researchers

A good scientific paper is essentially a product of the intellect of the researcher. However, in my experience there are many graduates in research posts who, though by no means unintelligent, do not have the combination of qualities needed for high quality research. Deficiencies naturally vary between individuals, but three characteristics stand out a lack of curiosity, an inability to see and analyze problems holistically, and a dislike of the self-discipline and commitment needed for the successful completion of a research project. Significantly, such people are often very 'busy' with matters other than research, and have a propensity to dabble in one inconsequential research project after another. Some even become senior research administrators, with predictable effects on the motivation and efficiency of their juniors.

It is also my experience, however, that there are potentially good researchers who currently perform poorly because they have a deficient training. They lack motivation and experience in problem solving, and are not properly advised by senior colleagues. Many grassland scientists are employed in the Department of Agricultural Development, where it is a rule that graduates must hold at least a Master's degree in a research subject before being appointed to a research post. Before, and even after, such an appointment their salaries are much lower than those of graduate extension staff with equivalent qualifications, and worse, similar to those of technicians with much lower qualifications. Moreover, even after appointment to a research post, they remain at a disadvantage because of the time they spent in a junior post while working towards a postgraduate degree. This is hardly a situation favouring the recruitment of good research material, and hardly an environment in which to motivate promising junior staff.

One might well ask, do the requirements for an MSc degree in grassland science provide adequate? In the preface to his informative book *How to write and publish a scientific paper,* Robert Day (1979) has this to say. "A scientific experiment, no matter how spectacular the results, is not completed until the results are *published*. In fact, the cornerstone of the philosophy of science is based on the fundamental assumption that original research must be published; only thus can new scientific knowledge be authenticated and then added to the existing data base that we call science". A properly-conducted research project involves a sequentially dependent series of activities, namely 1) identification of an important research subject, 2) planning the investigative procedure and, where applicable, assembling and locating the necessary materials, 3) executing the procedure and recording the observations, and finally, 4) interpreting and documenting the results in the form of a scientific paper. Experienced and talented researchers are skilled in all these activities, and usually produce valuable and, at times, elegant publications, which are widely read and appreciated. These form part of the factual base which is essential to the development of sound agricultural policies and extension programmes. All the steps leading to a scientific publication must be properly executed;

a poorly-conceived or badly planned and executed research project cannot yield a good publication.

The *Journal of the Grassland and Society of Southern Africa* is of crucial importance in the documentation and transmission of the results of research in southern Africa. However, of the many papers which I have refereed, disturbingly high proportions were not recommended for publication. Of those that were, many were only accepted after extensive revision and much time-consuming effort by referees. It might be argued that rejected material is not necessarily lost, and that the information can be published in 'popular' form. In general; however, papers are not rejected solely on the grounds that they are badly written. More likely reasons are that there are fundamental errors or weaknesses in say the design of the study, the method of execution, or the analysis of the data. If the results of such studies are presented in popular form, it will certainly be necessary to 'paper over the cracks'. It is in just this way that spurious information is relayed to producers, and incorporated into the dogma of grassland science.

Frequently candidates are presented, at a very early stage in their career, with a narrow research subject for investigation, provided with the necessary material, and told how to proceed. So 'programmed' they 'go through the motions'. Perceptive, original and probing thought, a prerequisite for good research, is not a requirement. Indeed, an imaginative student with a questioning mind might well develop a distaste for research out of sheer boredom. The upshot is, that while there certainly are good MSc theses (and good papers based on them) there are many mediocre or poor theses, and a corresponding number of mediocre MSc graduates, poorly trained, and in many cases unsuited to a career in research. One might also ask, should a MSc degree be a prerequisite for adequate remuneration and advancement of junior research staff! If the answer is no, then the question is, how can it be ensured that junior graduates are productively employed, while at the same time gaining experience and research skills'! submit that a good undergraduate training could form the initial basis for a research career.

Selected graduates could then serve an 'apprenticeship' of say two years in a suitable environment. He or she would work under experienced and competent senior staff with a view to gaining experience over a fairly wide field. During this period the individual preferences and talents in particular fields should become apparent. After this apprenticeship the potential researcher should be ready to undertake specific research studies with the aim of producing one or more quality publications. It is by these that he or she will be judged. Should a researcher choose at this stage to register for a higher degree, there can be no objection, provided that the end product of the activity is a good scientific paper or papers. However, the question arises, should the researchers who opt to not register for the higher degree, but have research papers accepted for publication in a reputable journal, be regarded as inferior to those whose publications are derived from theses? If it is accepted that the end product of research is a scientific paper, the answer must be no.

In the process of producing papers, the latter individuals will certainly by some means have to extend their knowledge and skills. That they do this without formally registering at say, a university, should be their choice. The proof of the pudding should be in the eating. Interaction between researchers and biometricians is ironic that in an era when most researchers have ready access to modem computer technology, access to biometrical advice is becoming increasingly difficult. This is primarily a consequence of the scarcity of biometricians, a situation which is made worse by the intense competition for their services in fields other than agriculture. Accordingly, current research projects are often planned without adequate biometrical consultation, and researchers commonly conduct biometrical analyses using standard computer software. There is, however, a disturbing tendency to confuse familiarity with computer operation with biometrical expertise. Data from studies in grassland science are often of such a nature that expert opinion is required on valid methods of analysis.

Slavish use of standard software, or incorrect assumptions about the: suitability of data for certain analytical procedures can lead to gross errors. Readers of scientific papers, including referees, do not have

access to the researcher's original data. Hence they are often put in the invidious position of having to accept without question a statistical output which could well be spurious. It is by no means uncommon for inexperienced researchers to design experiments without first consulting a biometrician. Having collected the relevant (or sometimes irrelevant) data, and struggled in vain to interpret it, they expect what is understandably a less than cordial biometrician to sort out the mess. Frequently this is impossible. The result is a shameful waste of time, research funds and facilities. The ideal arrangement is for the research scientist to consult a biometrician with suitable experience at the planning stages of the experiment, and, where appropriate, to maintain continuous

communication during the conduct of the experiment and the processing of the data. Where the contribution of the biometrician is appreciable, co-authorship is indicated. Indeed, there are circumstances which warrant senior authorship for the biometrician. Understandably, biometricians who are sporadically approached for advice, but are not closely involved in research projects, lose their motivation, and seek career satisfaction elsewhere.

Some biometricians, especially those with limited experience, have a poor understanding of the complexities and practicalities of research in grassland science. Where difficulties in communication arise, the researcher might need to obtain a second opinion.

The structure of organisations involved in research

In scientific research, as in life in general, there is no substitute for experience. In most professional disciplines it is usual to specifically arrange that holders of the necessary primary qualification gain further experience and training in the various subjects comprising the discipline. Agricultural science differs from most disciplines in that research is commonly linked to a specific environment. Certain principles are of course universally valid. However, in the field of grassland science, for example, the problems to be dealt with, and the knowledge and skills required by a researcher in say the Karoo will differ radically from those in the bushveld, or grassveld in a high rainfall area. In consequence, skills and experience tend to apply to specific environments. This creates problems in the organisation and structure of research, and these are exacerbated by the fact that the staff establishment in the respective environments is usually small, and often inadequate in relation to research needs. Promotion opportunities within a specific field of expertise are limited, and individuals transferred on promotion to a different environment may be at a disadvantage for several years. Moreover, if they are appointed as leaders of research teams, they will not, at least initially, be in a position to lead.

All but a few of the papers submitted to the *Journal of the Grassland Society of Southern Africa*' emanate from either the staff of the Department of Agricultural Development, or staff or students of university departments. Some of the papers which are not accepted for publication are clearly written by individuals who have little or no talent for research. However, many seem to have been written by relatively inexperienced researchers who have not had adequate guidance. I judge that a major reason for this is that in both the above organisations the senior staff do not have the time, or the specific knowledge or experience to properly guide junior researchers. On the other hand, it can well be asked, should senior colleagues who are not in directive posts be expected to guide junior colleagues? This is a time-consuming and often thankless task, which might seriously prejudice their own research output. Apart from the current deficiencies in post-graduate training discussed earlier, it seems to me that the establishment and structure of most organisations involved in grassland research in this country militates against the motivation and guidance of junior researchers.

Nominal research leaders in the Department of Agricultural Development, for example, are burdened with administrative duties, and a range of other commitments such as liaison with producer organisations and agricultural unions. In addition, in the modem dispensation of the Department, they must, because of a shortage or lack of specialist extension staff, often act as specialist advisors to individual producers. While they might, and usually do, become knowledgeable about agriculture in the relevant region, their wide commitments hamper their

ability to guide junior staff. Also, under the day-to day pressure from producers and others, there is a tendency to loses sight of the first priority of a research team, to produce high-quality scientific publications. If, good research has been done in the past, there might be some slack which can be taken up. However, in the long term the result is likely to be a poor research output, with low-quality publications arising from poorly-conceived and poorly-executed.

Conclusion

The present high rate of rejection of manuscripts submitted to the Scientific Editor of the *Journal of the Grassland Society of Southern Africa* is an indication of wasteful use of manpower and facilities in organisations involved in grassland research. Improving the standard of scientific papers, and thereby reducing the rejection rate, appears to require that attention be focused on three aspects, the selection of promising graduate researchers and improving especially their early training, improved liaison between researchers and biometricians, and revising the structure of research organisations to provide junior researchers with proper guidance and leadership.

Reference

Day R.A. 1979. *How to write and publish a scientific paper.* ISI Press, Philadelphia, Pennsylvania.