MANAGEMENT OF AN AGRICULTURAL RESEARCH INSTITUTION

John L. Nickel

Paper presented at the Workshop on
Agricultural Research Policy and Management held on
26-30 September 1983 by the
United Nations Economic Commission for Latin America
and the
Caribbean (UNECLAC)
Port-of-Spain, Trinidad & Tobago

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ISSN 1010-7045

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This publication is a reprint (with the permission of UNECLAC) of a paper originally titled "Agricultural Research Management" and presented at the Workshop on Agricultural Research Policy Management, 26-30 September 1983, Port-of-Spain, Trinidad & Tobago, and published by the United Nations Economic Commission for Latin America and the Caribbean (UNECLAC), 26 November 1984.

Centro Internacional de Agricultura Tropical (CIAT)
Apartado Aéreo 6713
Cali, Colombia

CIAT, Reprint series No. 002
ISSN 1010-7045
June 1988
Press run: 850
Printed in Colombia

Nickel, J. L. 1988. Management of an agricultural research institution. Paper presented at the Workshop on Agricultural Research Policy and Management held on 26-30 September 1983 by the United Nations Economic Commission for Latin America and the Caribbean (UNECLAC), Port-of-Spain, Trinidad and Tobago. Centro Internacional de Agricultura Tropical, Cali, Colombia. 26 p.

1. Agricultural research institutions — Management. 2. Agricultural research management. I. Workshop on Agricultural Research Policy and Management (1983: Port-of-Spain, Trinidad and Tobago). II. Centro Internacional de Agricultura Tropical. III. Tit.

Contents

Introduction

The need for well-managed agricultural research institutions has never been greater—especially in tropical developing countries where new agricultural technology is urgently required to reverse the current trends that show these countries as becoming increasingly dependent on food imports. Fortunately, national governments and international financial institutions are recognizing the key role of agricultural research and more funds are becoming available to build, develop, and strengthen national research institutions in the Third World.

Managers of research institutions are aware of funding constraints and convinced that if more funds were available for their particular institution more would be accomplished. No doubt that is true. Nevertheless, the topic of how to obtain more funds will be conspicuous by its absence in this paper. I am convinced that the key constraint for more effective agricultural research in many institutions today is management. Until management is improved, additional resources will not be used effectively.

Agricultural research management is an extremely broad topic. Viewed from the perspective of the management of a national agricultural research system, this subject encompasses the definition of national agricultural research goals and priorities; formulation of a detailed plan of research programs and projects in the framework of a national agricultural research strategy; assignment of responsibilities between various institutions to carry out these programs and projects; allocation of necessary financial, personnel, and physical resources to the respective institutions; submission of the resulting plans and budgets to appropriate policy-making bodies; implementation of approved research programs; periodic evaluation of results and revision of strategies and plans; dissemination of the results to users; obtaining feedback on the impact, strengths, and weaknesses of the new

technology and incorporating this information into the technology generation process; and last, but not least, keeping key policy-makers informed on agricultural research achievements.

Obviously, all of these important components cannot be discussed within the scope of a single paper. The important subjects of developing national science and agricultural research policies, allocation of resources, and integrating the various elements such as research institutions and universities, into national scientific and development programs were dealt with by other papers at this conference. My comments are therefore restricted to a consideration of the practical aspects of managing a major agricultural research institution, once the role of such an institution within the national, regional, or international framework has been determined and the resources allocated to it.

Many aspects of managing an agricultural research institution are sufficiently similar to the management of any organization so that the principles of management which have evolved over the years, and about which many books and articles have been written, provide useful guidance. The problem is that most agricultural research managers are scientists who suddenly find themselves in an administrative role without the necessary intervening formal training or opportunity to study management principles. Managing scientific research in general, and agricultural research in particular, is sufficiently different to managing other types of enterprises so that special management skills and considerations are required.

The need for special management considerations in scientific research organizations stems chiefly from the nature of the personnel involved. Not only are scientists highly educated, but they are also engaged in work that emphasizes independence of thought. Thus, even in large corporations, where general management techniques are usually well understood and employed, it is recognized that these people require unique management skills, and a considerable body of literature on industrial research and development (R & D) has developed.

Within the overall category of scientific research, agricultural research has some unique characteristics. Pierre[1] described them as dependence on a wide range of scientific disciplines; susceptibility to highly variable environmental conditions; an international character; and the unpredictability of farmers' acceptance of the end results. The complex nature of agricultural research can be understood by thinking of it as a two-dimensional grid: one dimension covers a spectrum of disciplines from the physical sciences through biology and engineering to the economic and social sciences, and the other dimension covers a spectrum that ranges from basic research on the one hand to developmental and technological research on the other[2].

1. Pierre, R. E. 1982. Administration of agricultural research in the Caribbean. In: Forsythe, W. M.; Pinchinat, A. M.; and McLaren, L. (eds.). Proceedings: Caribbean Workshop on the Organisation and Administration of Agricultural Research, Christ Church, Barbados, 1981. Inter-American Institute for Cooperation on Agriculture (IICA), San José, Costa Rica. p. 79-90.

2. Walsh, T. 1970. Some aspects of agricultural research management. In: OECD (Organization for Economic Co-operation and Development). The management of agricultural research. Paris, France. p. 39-55.

Organization

Traditionally, agricultural research institutions have been organized along disciplinary lines. More recently, some organizations have created departments based on lines of production. Frequently, these two types of organizations are superimposed in a matrix, or multiple-command organization.

Matrix management is particularly appropriate when scientists, representing different bodies of knowledge and distinct approaches, must work together to solve problems, and when expensive resources must be shared[3,4]. Matrix management models can be differentiated into two types: the leadership matrix and the coordination matrix[5]. In the former, the project leader motivates the team to work for project goals, whereas in the latter the coordinator merely keeps everyone informed about the project status and when their contributions will be needed. Multidisciplinary projects following the coordination matrix model are appropriate for universities in which strong, departmental lines are sharply drawn and individual scientists are more dependent on peer approval and publication within their own disciplines. In a problem-solving, production-oriented research organization, however, an interdisciplinary leadership matrix is more appropriate.

In terms of the need for scientists from specialized disciplines to work together to develop and evaluate new technology, and eventually make sure it gets to the consumer, agricultural research bears many similarities to

3. Davis, S. M. and Lawrance, P. R. 1977. Matrix. Addison-Wesley, Reading, MA, USA.

4. Birnbaum, P. H. 1979. Academic interdisciplinary research: problems and practice. R & D Management 10(1):17-22.

5. Gunz, H. P. and Pearson, A. W. 1977. Matrix organisation in research and development. In: Knight, K. (ed.). Matrix management: a cross-functional approach to organisation. Gower Press, London, England.

pharmaceutical research and development. Thus, the experience of the Upjohn Corporation in converting from a coordination to a leadership matrix is highly relevant. Stucki[6] has described this process and reported that conflict resolution was much better under the latter than under the former organization, and cited preliminary evidence of increased productivity under the new scheme.

Merely placing a breeder, a pathologist, and an economist together in the same team does not automatically ensure interdisciplinarity. Without some "organizational coercion," the individual scientists may continue to think and work within their own disciplines and remain multidisciplinary[7].

In my opinion, in many agricultural research institutions such organizational coercion can best be accomplished by eliminating the matrix and organizing the research scientists into interdisciplinary programs along commodity lines. I have managed all three types: that is, a coordination matrix in a university context; a leadership matrix, with "woof and warp" cross-hatching of disciplinary departments and commodity-oriented programs; and, more recently, an interdisciplinary organization in which all scientists are assigned to one or another of various commodity programs. Each type of organization has its place, depending on the kind of institution being managed and the amount of financial and manpower resources available in relation to the commodity areas which must be covered. However, the simplicity of the chain of command and the loyalty and motivation that come from building an effective team effort around a single commodity or set of related commodities give this type of organization great advantage when it can be achieved.

Probably the most important ingredient toward making an interdisciplinary team work together effectively is the

6. Stucki, J. C. 1980. A goal-oriented pharmaceutical research and development organization: an eleven-year experience. R & D Management 10(3):97-105.

7. Payne, R. and Pearson, A. 1979. Conference report: interdisciplinary research groups: an international comparison of their organization and management. R & D Management 10(1):35-37.

team leader. Such leadership requires special, rare skills, so that program leaders must be selected with extra care. National research institutions usually bear responsibility for a large number of commodities. Therefore, individual species commodity programs, except for the most important crops and animal species, may not be possible. Instead, the organization of programs around groups of related commodities such as grain legumes, root and tuber crops, or ruminant animals, may be necessary.

Another resource-related problem is that even in a large organization with few commodities to cover, it may not be possible to assign scientists in highly specialized disciplines to each program on a full-time basis. A useful compromise is to organize most of the institution along interdisciplinary, commodity program lines and to conduct the more specialized research within a scientific support unit serving all programs. The need to share expensive facilities as well as the desirability for close collaboration and communication between scientists within the same discipline can be satisfactorily handled by physically grouping together the laboratories and offices of scientists who are in the same discipline, but who are assigned to two different commodity programs.

Regardless of the organizational structure employed, strong support units, for example, biometrics, laboratory services, greenhouses, and experiment station facilities, are essential. These should be organized into service units that provide support for all programs.

Research Institution Administration

Role of administration

An effective and efficient administration component is absolutely essential to a research institution. Without adequate administrative services such as accounting, personnel, maintenance, or supplies, a research institution cannot function. Nevertheless, the raison d'être of the institution, and the service nature of the administrative units, must never be forgotten.

Arnon[8] referred to the problems that can be created "if the people engaged in administration come to consider administration as an end in itself and not as a means of furthering research, which is the basic justification for the work of all the people in the organization." Similarly, Pierre[1] emphasized that "administration should be used to facilitate rather than control research." I frequently remind my colleagues in administration that our role is to facilitate the work of the scientists. This is not to say that the administrative unit staff should not be given important status, nor treated with full respect as essential partners in an important task. However, nonscientific personnel must always recognize that only the scientists produce new technology; the role of everyone else, including the head of the institution, is only to create the conditions in which this can be achieved most effectively.

Arnon[8] also pointed out that people trained exclusively in general management without a research background do not understand the potentialities of research, the idiosyncrasies of the researchers, or how research has to be carried out. He and Moseman[9] both recommended

8. Arnon, I. 1968. Organisation and administration of agricultural research. Elsevier, Amsterdam, Netherlands. 342 p.

9. Moseman, A. H. 1970. Building agricultural research systems in the developing nations. Agricultural Development Council, New York, NY, USA. 137 p.

strongly that the head of a research institution should himself be a trained scientist; that administrative functions should be handled by skilled management personnel; and that the administrator of any institution should be a staff officer to the scientist director, acting only after due consultation with him. My own experiences support this view.

Administrative procedures

While I firmly believe that the head of a research institution should be an experienced scientist, the implementation of these principles introduces a built-in weakness which probably represents one of the largest problems in many research institutions today. Scientists undertaking the duties of director of a research organization often do not even realize how ignorant they are of the basic principles of management[8]. Research directors tend to concentrate on program development and neglect the establishment of sound administrative procedures. Among administrative procedures, none are more important than those related to fiscal management. Thus, research directors must depend on and give considerable authority to well-trained and experienced financial specialists and see to it that all the instruments for proper budgetary control and internal and external audit procedures are in place to ensure fiscal integrity and a high level of cost-consciousness, while, at the same time, avoiding excessive bureaucracy.

In the enforcement of administrative procedures, high degrees of fairness, integrity, and flexibility are essential. These cannot be achieved unless the procedures and policies are well codified. It will be very hard for a senior manager to be fair, or be seen to be fair, if each decision seems to be an ad hoc one. The rules must be clear. However, the proper codification of policies does not automatically result in an overly rigid bureaucracy—on the contrary, flexibility in making exceptions to the rules can be most effectively executed when the rules are well established and well known. The establishment of clear rules and the spelling out of well-defined procedures in an efficient, streamlined administration do not mean a

proliferation of paperwork. A requirement of many copies and many approvals is not synonymous with good controls. It may be just the opposite.

Participatory management

In the entire range of activities involved in the management of a research institution, from the establishment of the administrative procedures to the elucidation of overall research policies and priorities, the individual scientists must be brought into the decision-making process. The ability to permit participation by subordinates and others without feeling threatened is a recognized characteristic of successful executives[10]. This quality is particularly essential in scientific research management. Arnon[8] pointed out, too, that people who staff research institutions are those who "by training and inclination have usually been conditioned to averseness to administration in all of its manifestations." Later, he stated "the whole concept of superior-subordinate relationship, as it exists in governmental or industrial organizations, is uncharacteristic of the relationships between the different levels of research leadership. The need for decentralization, delegation, participation, and consultative management, as stressed by the human relations approach, is applicable to research organizations."

The advantages of shared deliberations include the development of a close relationship between the research director and the senior research workers; the development of a feeling of common purpose, shared interest, and a sense of involvement; stimulation of awareness of problems with which the organization is faced; improvement of communication, with opportunities for emphasis and clarification where required; and the fact that collective judgment may be more effective than individual judgment and that a check-and-balance system helps to prevent arbitrary decision-making by individuals[8]. Some disadvantages of sharing deliberation include the

10. Argyris, C. 1983. Some characteristics of successful executives. Personnel Journal 32(2):50.

use of valuable researchers' time and the fact that researchers often do not have a sufficiently broad understanding of the problems involved. Because they are more concerned with their individual subject fields than with institutional requirements or policies, they tend to resist proposals that may encroach on existing prerogatives.

In spite of their obvious and well-known weaknesses, shortcomings, and even dangers, committees present the best mechanism for introducing participatory management into a research institution. While this does use valuable scientist time, the resulting improvement in communications and the feeling of involvement that results from the interaction in these committees more than offset the time lost. Indeed, there is evidence that scientists are most effective when involved part-time in other activities such as teaching and administration. In a survey of 522 scientists in engineering in 11 industrial, governmental, and university research units, it was found that scientific performance (as measured by scientific or technical contribution and by general usefulness to the organization) for Ph.D.s and assistant scientists was higher for those who spent three-quarters of their time on scientific work than for those who had no nonresearch responsibilities.[11,12]

The use of committees provides great benefits in improved communication, understanding, and a sense of participation derived from involving scientists in the process of major policy decisions. This process also contributes greatly to the quality of the decisions made and the morale and productivity of the institution. The director bears the ultimate responsibility for the institute's policies; only he† can balance group judgment on the one hand with the needs and goals of the organization on the other. Thus, while the various committees must have different degrees of executive authority, normally they

11. Albers, H. H. 1969. Principles of management: a modern approach. 3rd ed. Wiley, New York, NY, USA. 702 p.

12. Andrews, F. M. 1964. Scientific performance as related to time spent on technical work, teaching or administration. Admin. Sci. Q. 9(2):182-193.

† The words "he," "his," and "him" are used in a generic sense when referring to research directors or scientists who may, of course, be male or female.

are advisory in nature. Although the director must maintain the right to make the final decision, he is well advised to act contrary to the considered judgment of committees he has appointed only rarely and after careful consideration.

Delegation of responsibility and authority

Just as a research manager is able to do a better job of decision-making by involving others in participatory management, he is also able to be more efficient and effective to the extent that he appropriately delegates responsibility and authority. As mentioned above, the final responsibility for management of the institute must rest with the director. However, only by delegating a major portion of his authority will he find time and freedom to handle adequately the many functions which evolve uniquely on him. Making important strategic decisions and developing a sound research philosophy for the institution require unhurried deliberation and wise advice. This requires time for thought as well as adequate communication. Only the director can perform some of the representation duties required for government relations and donor support. None of these functions can be performed well by a harassed chief, overly burdened by details which can and must be handled by subordinates.

Everyone knows that responsibility must be delegated--the mistake many managers make is to delegate responsibility without passing on commensurate authority. The most basic principles of classical organization theory first put forward by Fayol[13], and supported by many schools of management science since, emphasize that authority and responsibility should be commensurate; that is, if a person is made responsible for a certain function and task he must be given authority to ensure that he is able to carry out his obligations. Delegation of authority is ineffective if it is not visible and consistent. For example, when an area of responsibility has been handed over to a subordinate, it is that person

13. Fayol, H. 1949. General and industrial management. Pitman, London, England.

who should sign the memos and the approvals related to that area of activity. Too often it is easier for the chief executive to take action himself in an area he has already given to someone else. This temptation must be resisted or schizophrenic administration will result.

Delegation of authority and responsibility includes allowing subordinates to make mistakes and supporting them even when not fully in agreement with their decisions.

While I have repeatedly referred to the "director" as though he were a single person, much of what has been stated above applies equally to the several people who make up the top management of a research institution. Furthermore, in the same way as interdisciplinary teams are often the best way to organize problem-solving research, I have found "team management" to be an effective means of directing a research institution. Such team management is characterized by a broad sharing of responsibilities between the head of the institution and his close subordinates, along with a system of open communication, which keeps all members of the team informed about the actions of the others and makes it possible for any one to take on the responsibilities of another when necessary.

Research Management

Having dealt with some of the principles of managing a research institution, I now wish to comment on some aspects of the management of the research conducted in the institution.

Functions of research management

Breck[14] described management as the determination of objectives, the laying down of a broad policy for the achievement of these objectives, and the translation of that policy into programs for action. He summarized these functions as planning, organizing, leading, motivating, and controlling. Kidd[15] defined administration of research as "research planning on a broad scale, the development of scientific strategy, the evolution of a consistent philosophy of research, and the difficult tasks of bringing a sound philosophy to bear upon the conduct of research."

Planning and evaluating research

So far, I have used the terms "research manager" and "research director" somewhat interchangeably when referring to the person or persons in charge of a research institution. This is not surprising. If one accepts that agricultural research is the application of scientific principles and knowledge to the solution of agricultural production constraints, then, by definition, agricultural research activities cannot be interest-oriented, or opportunity-oriented, but must fit within a directed program oriented toward the solution of specific

14. Breck, E. F. L. (ed.). 1963. The principles and practices of management. 2nd ed. Longmans, London, England.

15. Kidd, C. V. 1953. Research planning and research policy: scientists and administrators. Science (Wash. D.C.) 118:147-152.

problems, a condition incompatible with the free choice of research subjects[8]. Thus, the scientists in an agricultural research institution must work within the framework of a plan, and research management involves a strong sense of direction.

Koontz and O'Donnell[16] defined planning as "the executive function which involves the selection, from among alternatives, of enterprise objectives, policies, procedures and programs." There is more literature on the subject of agricultural research planning than on many other aspects of research management. I will, therefore, not go into detail on this subject in this paper. However, I do wish to point out the importance of setting priorities and making the hard decisions of what to emphasize and what to leave undone. One of the most general, firm impressions I have received in visiting many national research programs is that too much is being attempted with the resources available. In order to be effective, national, regional, and international institutions must carefully analyze priorities and decide to concentrate efforts on a limited number of the most important commodities and research subjects. Similarly, every ecological zone cannot be adequately covered and many national research programs have too many stations for each to be properly staffed, equipped, and financed. The reduction of these to those which can be operated efficiently with a minimal number of scientists will also require some very hard decisions.

In this respect, planning cannot be separated from evaluation. Usually, resources are limited. Therefore, the introduction of a new activity or expansion of an existing one often means a shift in resources already engaged elsewhere. Scientific programs must be regularly evaluated to determine whether or not any should be discontinued. As Irvin colorfully puts it, "those most closely involved are most likely to see a need of continued research, just one more step and then another. In some cases the end comes not by natural death but requires

16. Koontz, H. and O'Donnell, C. 1955. The principles and practices of management, McGraw Hill, New York, NY, USA.

administrative euthanasia."[17] Setting priorities involves not only the research director—he must also depend on the informed advice of his colleagues. While much of the information on the establishment of priorities is intuitive, careful *ex ante* economic analysis to determine the costs, as well as the amounts and distribution of the socioeconomic benefits anticipated from the research, provides a valuable tool in the planning process.

One further point I wish to make, regarding the evaluation of research programs and projects, is the importance of a peer review. Clearly, the scientists must be involved in the evaluation process. Recognition, approval, and evaluation of his work by his peers is an important motivational force for a scientist, and peer review provides informed opinion which would not otherwise be available to research management. The procedure of an annual, in-house review (IHR) has become enshrined within the International Agricultural Research Centers. Dr. Jock Anderson, an Australian scientist who was a Visiting Scientist at CIMMYT (Centro Internacional de Mejoramiento de Maíz y Trigo), published an excellent review of the IHR procedure[18]. He stated that in spite of the fact that this takes an entire week of scientists' busy time, they "seemingly approach the IHR with enthusiasm and vigor." He pointed out that one of the important features in such a review is its comprehensive nature, and indicated that the feeling of "all in it together" is important in discouraging feelings of victimization and transparent vulnerability that must always accompany any probing criticism of research work in progress. He noted the open, constructive atmosphere for in-depth criticism in this process, but which requires particular personalities who can direct and lead discussions along perceptive and useful channels and who can criticize work without insult or personal attack.

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17. Irving, G. W., Jr. 1970. Programming research activities. In: OECD (Organization for Economic Co-operation and Development). The management of agricultural research. Paris, France. p. 109-118.

18. Anderson, J. 1976. Forum on formalized opinion of peers in monitoring agricultural research. Rev. Market. Agric. Econ. 44(3):119-122.

Anderson considered the process so effective that he recommended it for use within Australian agricultural research organizations. I believe it can be applied usefully to many national research institutions as a key component in the evaluation process.

Personnel Management

I have purposely passed over the important functions of planning and evaluation rather superficially in order to discuss what I consider to be the most important single component of research management:

The essence of research management is the art of managing scientists

Much attention is given to resource allocation, program planning and evaluation, and different institutional models, but in the end it is the scientist who is the key component to successful agricultural research. Without well-qualified, well-motivated, and well-led scientists, the most adequately funded, best-equipped, and best-organized research institution is useless. Thus, the most important role of the research manager is the "care and feeding" of research scientists. While the research director cannot devote all the time he would like to many aspects of his work, personnel decisions should never be made hastily. Whether it is in recruiting, reviewing the activities of individual scientists, or dealing with personal problems, no effort or time should be spared to do this part of the research management job well.

Selection

Research institutions spend 70 percent or more of their budget on personnel; yet the matter of recruitment and selection is often done routinely and without sufficient in-depth analyses. I had the pleasure of serving as a Visiting Scientist in the International Rice Research Institute in 1964 during its formative years. Naturally, when I first arrived I was favorably impressed by the quality of the facilities. However, the more important and lasting impression was the uniquely high quality and high

motivation of the scientists I found there. The late Dr. Sterling Wortman was at that time Associate Director for Research, under the strong leadership of an outstanding administrator, Dr. Robert Chandler. In this capacity, Dr. Wortman was responsible for a major part of the scientific staff recruitment. Years later, when I was a Research Director myself, I asked him what was the secret of his success in recruiting such outstanding scientists. He did not hesitate a moment in his reply: "the most important ingredient to the recruitment of scientists" he said, "is to have a very clear understanding of what that person was going to do and how he would fit into the overall institute program before beginning the recruitment process." This is an important distinction, because so often research institutions do it the other way around, attempting to fit the scientist to the job or fit the job to the scientist rather than to select the most outstanding scientist, uniquely qualified for the specific task at hand. Let me give a simple illustration. If a particular research program needs a field-oriented crop physiologist, and the candidate selected is a laboratory-oriented biochemical physiologist, it will be very difficult to change his nature and interests, regardless of how intelligent and motivated he may be. On the other hand, changing the job to fit the scientist recruited changes the whole nature of the program.

Since I have emphasized the value of interdisciplinary team research, two points that relate specifically to recruitment for such organizations should be noted. One is that the ability of the candidate to work as a harmonious member of a team should be considered along with other qualifications. The other is the importance of a degree of involvement of team members in the selection of potential future colleagues.

Motivation

Of course scientists must be adequately remunerated and those performing exceptionally well must receive special merit increases to reward good performance. Many national programs are unable to provide adequate compensation or differential merit awards because they

are tied to a civil service system. Fortunately, there is a strong trend to establish agricultural research institutions as autonomous or semiautonomous organizations, which is beginning to help overcome this important problem. However, financial remuneration is not enough. Even more important, in my opinion, is that the scientists must feel that what they are doing is important and know that their work is recognized and appreciated. In the field of agricultural research, particularly in developing countries, we have the distinct advantage of having little trouble in finding grounds to convince scientists that their work is indeed very important. What could, after all, be more important than contributing to the solution of hunger and poverty today? Recently, a research manager was telling me that the role and importance of agricultural research was not adequately recognized by government officials and policy-makers. This was not surprising, but what shocked me was when he went on to say that even the individual scientists did not recognize that what they were doing was important, but were merely doing their own thing without understanding how their work contributed to the whole. While as a guest I could not say so, I was tempted to say: "well, what are you doing about it?" Motivating scientists to understand the important role of the institute and the key role they play in it is one of the most important duties of a research manager.

I have found that good working conditions are also probably more important than monetary remuneration for the motivation of scientists. This means not only adequate research facilities but also appropriate administrative policies that minimize bureaucratic constraints and maximize the amount of support the scientist receives.

Finally in the area of motivation, I cannot overemphasize the importance of recognizing each scientist as an important, individual human being, with problems, concerns, ambitions, and pride which must be recognized with concern, interest, and compassion. In my experience, it is often the most productive scientists who require the most attention. The research manager who dismisses such personnel as prima donnas or troublemakers is foregoing a very valuable asset.

Some scientists will seek attention; others are more shy. In order to ensure that all have opportunity to express their views and report personally on their activities, a systematic program for meetings of the research director with the individual scientists should be established.

Leading

While I have stated that the research in an agricultural research institution must be directed, and have mentioned "control" as one of the important functions of research management, such direction and control can be applied effectively only through leading and guiding in an atmosphere of persuasion and consent. Scientists, probably even more than others, are usually allergic to excessive control, even if exercised by other scientists. A good research leader provides scientific guidance without stifling initiative. He cannot do so without occasionally having to criticize. However, the right to criticize is earned by praising when praise is due. An effective leader will, therefore, actively seek opportunities for genuine praise (not flattery), and when criticism is necessary will be careful to criticize the performance rather than the person. Blanchard and Johnson[19] pointed out the importance of reprimanding the behavior only and never attacking the person's worth or value as a person. They also emphasized the need for each person to have very clearly stated goals and objectives. This is in contrast to what they refer to as the "leave alone-zap" style which characterizes some leaders who never make it clear to a person how he is doing but save all the criticism for the annual evaluation. It is much better to set clear objectives so that staff know what is expected of them and let them know when they are doing things right and when they are doing things wrong.

If the research manager has been careful in the selection of the scientists and has clearly outlined their areas of responsibility, then he can give the scientists ample range for personal initiative. I like to remind our

19. Blanchard, K. and Johnson, S. 1982. The one minute manager. William Morrow, New York, NY, USA.

scientists that what we expect from them is relevance and responsibility and in return we in the administration owe them trust and flexibility.

The foregoing emphasis on participatory management, on concern and attention to the individual, and on trust and flexibility should not be interpreted as giving license to sloppy, unstructured management. Discipline is also important. Those who do not respond to a concerned and flexible administration with responsibility must be dealt with accordingly. The good research manager is compassionate in relation to personal problems but must be firm when it comes to matters of performance and discipline.

Taking and making time

One of the most precious commodities of a research manager is **time**. There are simply not enough days in the week, hours in the day, or minutes in the hour to accomplish everything it seems he should do. And yet I have stressed the importance of making decisions and handling personnel matters in a relaxed, unhurried atmosphere. When a scientist comes to see his director about a problem, which to him is the most important in the world, he must have the feeling that the director has all the time in the world to discuss it.

The effective research manager, therefore, must develop a strategy to make time available. Such a strategy should not be based on merely working longer. I am not impressed by the research manager who consistently works excessively long hours. Naturally, there are emergencies when certain deadlines must be met, and when evenings or weekends must be devoted to the task. However, this should be the exception rather than the rule. The type of intense concentration which is required for effective research management simply cannot be sustained by most human beings much longer than the normal working day. While most research managers will not be able to adhere strictly to an 8-to-5 day, and clock-watchers are to be avoided, one who

works excessively long hours consistently is probably not very productive in those extra hours.

More important than working longer is better use of the time available. How can this be done? One way is to delegate responsibility, which has already been discussed above. The other is to improve the organization in the use of time.

In order to have the time to give careful consideration to policy and personnel questions it is essential to set aside sustained periods which will not be interrupted. I do not believe that a research director can afford to have a totally "open door" policy. He must have a "closed door" and an effective secretary who will keep him from being interrupted (except for emergencies) for a certain period of time each day, while reserving another period for fixed appointments and ad hoc visits. It is amazing how much more can be accomplished in an uninterrupted hour than in 12 five-minute periods. No doubt there are other ways of improving time management, but the key word is organization, and the research director will never be able to efficiently manage his time unless he finds some way to deal expeditiously with the large volume which inevitably crosses his desk. In this regard, I have found the advice that the late George Harrar gave me when I first became an administrator, to try and handle any piece of paper only once, very helpful.

Characteristics of a Good Research Manager

The foregoing discussion can probably best be summarized by describing some of the qualities which will characterize a good research leader:

He is fair, honest, and consistent.

He cares about individuals; he is concerned for their welfare, and demonstrates interest in their individual activities. Small things such as going to the office or laboratory to see a scientist rather than having him come to the administration office, and being careful to attend seminars, symposiums, and conferences given by the scientists, demonstrate such interest and respect.

He is respected. Everyone wishes to be liked, but this is not always possible and the research manager who tries too hard to be a "nice guy" will not be able to make the inevitable tough decisions. Even unpopular decisions, when made with integrity, will earn the respect of staff, which is more important than their love.

He is decisive. I have heard that a chicken crossing the road is an example of a poor executive, in that the chicken waits until the last moment to make the decision and then makes the wrong one. Many times even a wrong decision is better than no decision at all. Research managers have to be willing to make mistakes, although it is hoped they do not make too many.

He delegates responsibility and authority and supports the actions taken by his subordinates.

He is a full-time research administrator who enjoys the art of management and has decided to make it a career. Too many scientists, experts in their particular field, attempt tenaciously to continue their own research activities after having taken on important administrative

responsibilities. The insidious danger of trying to keep a foot in both camps, attempting to keep full involvement in the direct conduct of research but reluctant to give up the prestige of an administrative post, must be avoided. The result is usually a poor scientist and a poor administrator. Research institutions should choose as their leaders those who have decided to make scientific administration a career.

He is a good communicator. The need for good communication with scientists and other staff members has already been discussed above. In addition, a research manager will need to be skilled in speaking and handling the written word with clarity and felicity.

He insists on excellence. The job of increasing agricultural production is simply too important to be done in mediocre fashion. Excellence is not usually more expensive—it just requires better motivation and organization. One of the other things which impressed me as a Visiting Scientist at IRRI was the emphasis on excellence that resulted in the quality of the work produced. Chandler, describing the history of IRRI since 1968, related how he continuously reminded staff that those who judged IRRI would base their opinions on whatever contact they happened to have with it. If they received a letter with grammatical or typographical errors, or if they observed that the grounds were not neatly maintained, or that the drivers were careless and over-relaxed, they may assume that the Institute's research program was slackly run as well. He stated that he "stressed the importance of doing a quality job in every department and operation and urged all to take pride in helping IRRI establish a first-class reputation."[20] I believe all research institutions will benefit by such an emphasis on high standards.

20. Chandler, R. F., Jr. 1982. An adventure in applied science: a history of the International Rice Research Institute. International Rice Research Institute (IRRI), Los Baños, Philippines. 233 p.

In Conclusion

I wish to turn from the specifics of managing a research institution to the broader subject of agricultural research in the Caribbean. This workshop presented a rare opportunity to strengthen agricultural research in this region. Gathered together were research leaders, government policy-makers, representatives of international organizations and donors: all of whom play a vital role. This timely opportunity presented such leaders with a challenge to act with boldness and dedication in a spirit of cooperation.

Such leaders must challenge with boldness existing organizational structures and management procedures to make possible the establishment of clear priorities and their efficient pursuit. They must find ways to collaborate effectively. Their task is too important—and the resources available too limited—for them to tolerate wasteful duplication. They must dedicate themselves totally to the noble task of improving human welfare through increased agricultural production. Too many people's lives and well being depend on their efforts for them to do less.