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Introduction

During this quarter there were no personnel changes. The team continues to work with a deficiency of personnel having only 8 of the possible 13 positions on the contract filled. Arrangements are being made to fill some of these vacancies, however, most of them will not be filled until January 1, 1967. In view of the fact that project work in Porto Alegre is increasing rapidly and projects begun by staff who have already returned to Madison continue, the present staff members are overloaded. We wish to stress the importance of early selection of replacement staff and the importance of maintaining a full complement in order to attend the work of the project. It is difficult to plan for future development of the University of Rio Grande do Sul if we can not count on timely replacement of own personal.

We had two visitors from the Madison Campus during this quarter. Dr. Marvin Beatty visited the Campus during the month of April as a consultant for the soils project. He also presented a paper before the Pan-American Soil Conservation Congress. Dr. Beatty did an excellent job and will be returning to Rio Grande do Sul to work on a two year contract beginning in January. The second visit was administrative in nature. Dr. Edwin Heizer attended the Contractors Conference in Rio in May and visited to the campus of the University of Rio Grande do Sul. In addition to the normal administrative visits, we had a lengthy discussion with the Reitor in regard to a certain project problems and responsibilities on part of both the American and Brazilian staff. The Reitor promised to continue working to improve the support for the project through increased University budget and additional personnel. We were also able to demonstrate to Dr. Heizer that not all of the weather in Rio Grande do Sul is bad. I am sure that his visit, if not more successful, was certainly more comfortable than his visit last year.

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The project received the first allotment of CONTAP funds and has been successful in spending 2/3 of these funds. The final third of the funds has been released to the University, but due to administrative problems these funds have not been released to the projects. These problems are principally related to the fact that this is the first time that the budget had been handled in this way and no one fully understands how these funds should be administered. The University and our Brazilian Coordinator, Dr. Grossman, are working very hard to resolve this problem. We anticipate that in the future we will have fewer problems in the release and utilization of these funds. The present method of administration has the disadvantage of being less flexible because of the multitude of regulations placed on the University in spending funds. However, it has the advantage in that the University is gaining experience in administering funds for this and similar projects.

#### Teaching

In the fall semester just ended, Professor Bostian taught a course in Agricultural Communications-Technical Writing to the 20 graduate students of the five graduate courses. The course emphasized thesis preparation and research writing.

Johnson spent a major portion of his time in teaching the course in Farm Management in the post graduate program. The course met four hours per week and teaching duties were shared by Prof. Jorge Oliveira. The students made an all day visit to two farms to get information which they used for a farm planning problem.

The under-graduate course in extension offered in the Faculty of Agronomy has been completed and plans for the second semester are underway. Prof. Vaz Costa and Matteson, with a committee of students, identified eight farms on which the students will work to gain field experience. Each student will visit a farm,

identify problems and submit a report by the middle of the semester which will include possible solutions and the procedure he would follow if he were the agronomo in this county. Final preparations for the graduate extension course are being made. Prof. Vaz Costa will share the responsibility of teaching this course.

Drolsom taught the post-graduate course in plant breeding and continued advising graduate students with thesis problems. Kussow also spent a major portion of his time assisting the graduate students in Soils in the laboratory phases of their research programs and teaching a course in Analytical Chemistry. Murdock worked with the soils students in field and greenhouse research and taught the laboratory section of Plant Physiology. Due to lack of experience in laboratory work, the graduate students require close supervision when beginning to analyze research samples. An attempt is being made to correct these technical deficiencies in the laboratory section of the Analytical Chemistry course.

It is hoped that by January all 6 members of the first group of soils graduate students will have completed their thesis. One student is presently working on the first draft of his thesis and another should begin writing soon. The remaining students are busy harvesting plots and analyzing soil and plant tissue samples. Some results obtained thus far are as follows:

1. Corn yields on experimental plots at the University Farm ran as high as 133 bushels per acre (state average 15 bu/h).
2. Results from a greenhouse study indicated that on some soils of the Planalto application of lime as well as NPK fertilizer may almost double corn yields, but induce sulfur and other minor element deficiencies.

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3. The stosolic soils of the Planalto contain 20 to 40 percent free iron oxides and the distribution indicates that the rate of mineral weathering in the surface horizon exceeds the rate of transport of sesquioxides to the subsoil.
4. Forage and soybean yields were increased greatly by phosphorus application.

Four of the five new graduate students in soils are now reviewing the literature and preparing project proposals. The fifth student has, with the aid of Dr. Marvin T. Beatty, selected and begun work on his thesis problem. In general, we are very pleased with the capabilities and progress of the students.

#### Research

The Communication and Credit (Boston) project has as objectives to measure the flow of credit information to the farmer-user. Measurements are being taken of the information flow from banks, other credit institutions and mass media; and of the information farmers receive from these sources, plus farmer understanding municipio of Ibirubá, the site of a previous credit project and of a future saturation effort, is the unit being studied. A questionnaire has been pre-tested and is being used in interviews with 124 farmers in the municipio. Graduate student Ivo Schneider leads a team of 4 interviewers. Interviewing should be completed by July 15.

The Leadership in Rural Development (Boston and Matteson) research project is a cooperative one between the University, ASCAR, Frontier Sudoeste and USAID/Wisconsin. This project had encountered difficulties in beginning, however, the final questionnaire has been prepared and will be printed in early July. The sample for two counties, Bento Gonçalves and Farroupilha, is being taken and plans are being made with municipio leaders for the field work. Field work is planned for July 15-30. The other four municipios may likely not be studied until December.

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The descriptive report on the Cattle Productivity Study by Haralambos Simeonides was reviewed by Johnson and several suggestions for improvement were made. He also spent some time with two graduate students on their thesis projects. One is concerning the relation between the use of credit and farm productivity and the other is an economic analysis of improved pastures in the area of Bagé.

A new research project was drafted for presentation to the research committee of the IEPE with financing through a project of the U S D.A. Economic Research Service in cooperation with the Fundação Getúlio Vargas and Ministry of Agriculture.

The title of the project is Economics and Social Factors Affecting Changes in Agricultural Productivity.

Analysis of data from the Credit Study gathered in the farmer interview is underway. Erven has made arrangements with IBM of Pôrto Alegre to use their computer facilities for data processing. Statistical programs were selected from the MEDCOMP program library. These programs have been "debugged" using hypothetical problems with precomputed solutions and are now ready for use in the analysis. Considerable time was required for the selection and "debugging" process as there is not statistical consultant available at the University or IBM. However, IBM is providing a programming consultant. Erven has prepared detailed written directions for the data code and coding process for use in the states of São Paulo and Santa Catarina. The data analysis in these two states will be made by personnel of the Ohio Agricultural Finance Center in cooperation with the Brazilian agencies involved in the credit studies. He spent three days in Santa Catarina working with the Economic Research Institute at the University of Santa Catarina, assisting with the coding of the questionnaire and organization of the analysis for the credit study.

Prof. Rask has left Rio Grande do Sul and the Wisconsin Contract has assumed the USAID responsibilities of the Credit "Saturation" Study. We will be involved in the research and extension assistance aspects of the project. In this connection Murdock and Erven made a trip to Ibirubá with other members of the project planning committee. At that time the final plans were made for the project and agreement was reached concerning the amount of money to be requested. The Banco do Estado do Rio Grande do Sul and the Banco Agrícola Mercantil have each made application to the Banco Central do Brasil for Cr\$ 500.000.000. The request for the money are being processed at the Central Bank. The project is ready to proceed as soon as the money is made available.

The study An Analysis of Dairy Farming Practices on Small Farms in the Municipio of Viamão was completed and is now being used in the under-graduate course in the Faculty of Agronomy by professor Vaz Costa. A study titled Determining the Educational Needs of Present and Future Agriculture Instructors in Rio Grande do Sul was proposed by Matteson in April. The proposal and questionnaire were given to professor Martins and Mattoso for their approval. The questionnaire was then pretested and revised. It will now be sent to all of the Agriculture teachers in Rio Grande do Sul

In the area of agronomic research Drolson reports that fall growth of all winter forage, weather seeded this fall or last year, was restricted severely because of lack of moisture. Above-normal temperature persisted, intensifying the damage, until some rain fell in mid-June. Even so, insect attacks, especially aphids on winter oats, have been and will continue to be damaging as long as temperatures are unseasonably high. Experiments of Newton Martins concerning introduction of winter forage species in native pasture without plowing have suffered considerably. Species needed in late April had not emerged by mid-June. A reseeding species suitable for winter pasture, such as the subterranean clover used in the sod-seeding experiments a year ago, began growth in mid to late

March, subsequently, most seedlings died because of lack of moisture. With rain beginning in mid-June, development of winter pastures will be observed closely to note recovery.

Certain introduction of pangola grass and other species obtained from IRI. Matão, São Paulo, which were placed in the field on March 10, 1966, grew considerably, despite the lack of moisture. Notably vigorous in establishment were. Digitaria dev. psinervia (427), D. setivalva (431), D. swazilandensis (434) D. milaniana (438) and a Brachiaria species (442). Common (D. Decumbens) and A.24 (D. pentzii) were inferior to the above in establishment characteristics.

Sorghum harvest has been completed and data are being summarized. The National Trial included 4 dates of planting for a 4 grain and 4 forage strains and grain and forage variety trials. Yields of grain in the variety trial were lower than last year, with the top-yielding variety producing approximately 4100 kg/ha. Last year the top yield figure was over 6000 kg/ha. In the grain-date of plantings series, yields were very low in the third and fourth planting dates, Dec 17 and January 7, respectively. RS301F was included in the forage date of planting series and produced practically no seed with the third and fourth seeding dates. Excessive rain and possibly unusually low night temperatures, during the flowering periods may have been responsible for this phenomenon. Sumac forage sorghum, an open-pollinated variety, produced seed at all seedling dates, demonstrating differences in varietal response.

Forage research in Rio Grande do Sul, and particularly in the High Plateau area, suffered a severe loss with the sudden death of June 8 of Carlos Luiz Cremer, agronomist at Vacaria. His enthusiasm, knowledge, and support of cooperative USAID-University- Secretaria research projects will be sorely missed.

During the first of April Larsen attended a meeting of the Livestock Committee composed of Americans attached to various AED IRI and PASA groups all over Brazil. The meeting was held in Campinas where they visited some of the IRI research projects as well as a number of good farms in the area. The main function of the meeting was to discuss current projects in animal research, suggest areas of needed research and make recommendations for livestock research and industry in Brazil.

Relative to research in Animal Nutrition Larsen reports that the alfalfa plots planted a year ago at Montenegro were harvested on April 4 for dry matter yield. During the year they have been cut a total of seven times. In addition to the fertility and varietal plots they now have a five hectare field planted to creola alfalfa which is the variety that showed up best in the plots. The field was limed and fertilized according to soil test recommendations. Germination was delayed because of lack of rainfall but since the rain, germination appears to be excellent.

During the latter part of the quarter a good portion of the equipment for making hay and silage at the Montenegro Experiment Station was acquired. They plan to produce fairly large quantities of good quality alfalfa hay for the young animals and the milking animals of the herd. Currently alfalfa hay sells for about \$ 70 a ton locally. One of the most pressing needs at the Montenegro station and in other sizeable milking herds is for a source of good high quality nutrients to keep the herd replacements growing and feed the milking animals during times of short feed supply. Plans are to provide an abundant supply of high quality forage for these animals. (This explains the extensive agronomic work reported in Animal Nutrition section and should indicate the degree of cooperation within these sectors of work, J.T.M )

During this quarter a great deal of the time and effort was spent planning the layout and position for the new milking parlor at the Montenegro Experiment Station. The present barn is being

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completely remodeled to better adapt to the herringbone parlor system and make it much easier to produce a high quality product. The milking equipment for installation in the parlor has been ordered and should be here in August. The administrators of the Secretary of Agriculture are taking an increased interest in the Montenegro Station as a place of greater potential for research, extension and teaching. If present interest continues Montenegro could well become one of the most valuable experiment stations in Rio Grande do Sul.

Work is progressing at the University in the area of animal nutrition. Paulo Prestes has received permission to spend full time for the present in the Animal Nutrition Research Laboratory at the University. As a result the group are now making a detailed study of the Carbohydrate changes which occur in the corn plant after ensiling in a bunker silo. Recently they acquired a G.M.E. automatic fractionator which has been installed in the laboratory to separate and identify the soluble carbohydrates in the green and ensiled plant. In cooperation with the animal nutrition lab of the Secretary of Agriculture they are also beginning a second phase of the study in which they intend to study the protein and N P N portions of the corn plant before and after ensiling. One of the main objectives will be to study the changes that occur in the dry matter content of the corn plant when ensiled and the effect on dry matter constituents as related to location in the silo.

In anticipation of our future program of forage evaluation by in vitro artificial rumen methods we have acquired a Holstein cow which was fistulated by a member of the staff of the Veterinary School. The job was very well done and with surprising ease, especially since this is the first cow to be fistulated in Rio Grande do Sul. The technique used was somewhat different from that used at Wisconsin, but seems to be equally effective.

In the area of Soil Fertility the rice plots in the 19 fertility and variety trials conducted in cooperation with IRGA have been harvested. At present the grain is being dried and yields tabulated in preparation for statistical and economic analysis. Although responses in the fertility trials appear to be similar to those observed last year, the different varieties varied considerably in their response to fertilizer and the nature of these responses varied from site to site. Data from the corn and soybean plots is also being analysed. The forage plots are continuing to show good responses to lime and phosphorus.

#### Extension

On May 27, 30 Brazilian participants returned from agricultural study in the United States, met at the University to evaluate their U.S study programs with the guidance of Canon Hearne of Washington. This meeting, which included Director Mozart of the FAV and Bento Pires Dias of ASCAR was arranged by Bostian and Matteson. In late April, Bostian (Johnson and Matteson) went to Pelotas to confer with CETREISUL director Arno Schneider and DIDA director Raul Rosinha concerning the agricultural information program of that institution. Bostian also conferred with Rosinha in Porto Alegre twice concerning development of the Pelotas information program. In a visit to Recife and Fortaleza, Bostian conferred with several agency communication specialists including those of SUDENE, ANCAR PE, CETREIRO and the Federal University of Ceará, advising on communication problems. He also attended the second national meeting of ABIR, the national association of Brazilian agricultural information specialists, to help form the association and to establish plans for CECOR, the national training and research center in agricultural communications.

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The rural social science department of the Faculty of Agronomia took responsibility for the program part of a 5 day seminar for all agricultural technical workers in 7 counties in the region surrounding the Universities Experimental Farm. The program centered around improving beef cattle production, with emphasis on pasture improvement. There were about 40 participants and Bostian, Matteson, Johnson, Larsen, Drolsom, Murdock and their counterparts took part in the program.

Matteson presented a seminar to the professors at Escola de Viticultura e Enologia at Bento Gonçalves. The topic discussed was factors to consider when developing and educational program for adults. As a result of this seminar this professor was asked to help with the various phases of an adult education program that is to be initiated at this school later in the year. He also made three trips to Pelotas in an attempt to improve the farm shop which exists in the Escola de Visconde Graça. During the last trip professors Nestrand (USAID) and Matteson spent considerable time with professor João Geraldo Cazaralli the professor in charge of the shop. Matteson was also invited by USAID/Rio to work with SEAV on the evaluation of the Agriculture Curriculum and Adult Farmer courses conducted in SEAV's Agriculture Schools. He received a letter of commendation from the ARDO office for this work.

The proposal for the preparing of prospective vocational agriculture teachers was returned to Matteson by Director Mozart to be submitted through the Rural Social Science Department. The proposal was submitted to the Department and was discussed. Because of the interest indicated an invitation is being extended to the director of the Pedagogical Institute to determine what the two institution can do together to prepare prospective agriculture teachers.

During the last three months Matteson has had the following contacts with ASCAR;

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- a) Attended a Conselho meeting with Murdock as Newberg representative.
- b) Met with the 4-S leader, to gain knowledge of the existing program and establish a working relationship.
- c) Met with Walter Mertins, communication specialist to discuss information he requested in the area of adult education.

The Osorio pasture demonstration was visited by Drolsom in early June. Earlier growth of ladino clover, especially was lush because of adequate summer moisture and native species also grew vigorously during the summer, aided no doubt by improved fertility. Subsequently, the area was grazed heavily. Recovery of the ladino was very poor, and other species (birdsfoot trefoil, subterranean clover, tall fescue and hardinggrass) were not evident. Growth of native grasses was good during the summer and continued into late fall, which is longer than usual, and therefore competed with the winter species. This emphasizes a point that improvement of native pastures by management practices needs to be studied more thoroughly. This is certainly true in the large area involved in the rice-pasture rotation, where low winter temperatures probably are not as damaging as in the higher elevation areas.

Drolsom, Murdock and Kussow assisted in the organization of the forage demonstration project being administered by the Faculty of the Escola de Agronomia e Veterinária and supervised within the Forage Institute. The seed and fertilizer (20 tons of clover and grass seed and 300 tons of 18-46-0) destined for extensive demonstrations of improved pasture arrived too late to permit implementation of the program this year. As an alternative a portion of this material is being used to conduct limited demonstrations and the remainder is being held in storage until next year. This year's demonstrations are somewhat of an experimental nature and include the interseeding of forages with wheat on

the Planalto, the overseeding of rice fields in the Central Depression, and the establishment of summer pasture on the Fronteira. Much of the field work is being conducted under the direction of one of the graduate students in soils.

#### Institutional Development

One of the major responsibilities of this project is to help develop the concept of teaching, research and extension within the University system. We feel that a great deal of progress has been made in regard to this objective. The formation of a Soil Institute within the Faculty of Agronomy and Veterinary is presently being studied. This Institute would incorporate a part of the research program of the Secretary of Agriculture and strengthen the teaching and research program which is presently being conducted in the Faculty of Agronomy and Veterinary. Also, suggestions have been made in regard to combining the Animal Nutrition section with the Institute of Forages in order to form an Institute of Forages and Animal Nutrition. New facilities for the Animal Nutrition laboratory have been provided and a request for the formation of this Institute has been forwarded to the Director.

During Dr. Heizer's visit here the Rector of the University of Rio Grande do Sul requested that we submit our suggestions in regard to a restructuring of the Faculty of Agronomy and Veterinary. This report is presently being completed and soon will be presented to the Director and to the Rector of the University. It will include a discussion of the objectives of our project, staff increases required to maintain the program, desired structural changes and a budget indicating financial obligations for URGS related to continuation of the project.

Progress has been made in University relations with ASCAR (the local extension agency). Several new projects have been established with ASCAR in which the University is acting as a source of research information and technical assistance. A formal contract with ASCAR is presently being studied.

Recently, director Mozart had received thirty million cruzeiros from INDA in order to carry on research and extension activities in the Faculty. As a result the following actions were taken:

- a) Director Mozart employed an Agronomo in soils and an other in crops to do extension work in the state of Rio Grande do Sul.
- b) Mozart will make available, as soon as possible, office space and facilities for all members of the social science department and specifically request that agriculture extension and communication be located in Agronomia.
- c) The leadership study mention previously in the report will be conducted in the Faculty of Agronomy.

It is hoped that as a result, Professor Oliveira will be employed to work on this study and to teach courses in Rural Sociology in the Faculty. The Faculty of Agronomy and Veterinary has requested an appointment for Eng.-Agr. Ricardo Pinto Porto as director of research publications.

#### Consultant Reports

Four reports were submitted by Consultants during this quarter. An excellent report was submitted by Prof Todd and his team of veterinarians who visited Rio Grande do Sul to do a survey relative to species and degree of parasite infection in cattle in the State. This study has resulted in increased interest in this serious problem and a cooperative research program between the two Universities is being planned.

Prof. Klingbeil reported on the Temperate Climate Fruit Feasibility Study made during the first quarter of this year. This report indicates the possibility of a multimillion dollar fruit industry in Santa Catarina. Needless to say a tremendous amount of interest has been created and we are anxious to follow through with suggested programs. As a direct result of the work 4 Agronomos have applied for bolsas to study temperate fruit culture in the States.

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Prof. Haller submitted a report on his visit and has been successfull in helping to recruit an experienced rural sociologist to work with us. Prof. Beatty's report is seving us the basis for advanced planning in soil survey projects with which he will be working when he arrives here in January.