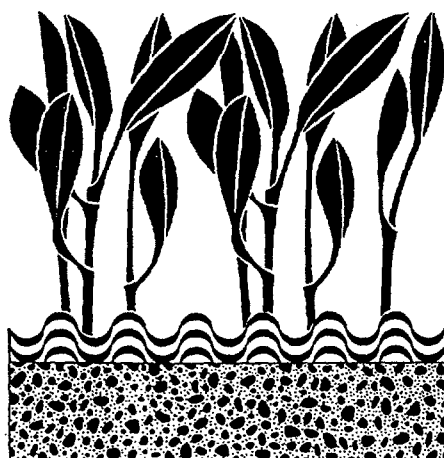




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Soils Newsletter



JOINT FAO/IAEA DIVISION
OF ISOTOPE AND RADIATION APPLICATIONS
OF ATOMIC ENERGY
FOR FOOD AND AGRICULTURAL DEVELOPMENT
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA

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TO OUR READERS

This will be the first issue of the Newsletter published without the guidance of Dr. Y. Barrada. Dr. Barrada recently retired as Head of the Soil Fertility, Irrigation and Crop Production Section after a distinguished career with the IAEA. Most of our readers have met Dr. Barrada, and many of you have enjoyed his warm hospitality. You will thus wish to extend best wishes for an active and happy retirement to Yehia and Farina. His address is Dr. Y. Barrada, P.O. Box No. 8, Masr el-Kadima Post Office, Cairo, Egypt.

This issue of the Newsletter outlines the Technical Assistance projects planned for 1981. The IAEA will again be funding many worthwhile projects related to soil science in developing Member States. In many cases the projects will involve expert assistance from soil scientists familiar with isotope and radiation techniques.

The Soils Section will have a very busy year in 1981. Two research coordination meetings have been held, and two more are planned. We will also be involved in four training courses. After the success of our initial Workshop on ^{15}N Methodology, associated with the research coordination meeting on dinitrogen fixation, we are planning a second workshop on isotope techniques later this year. Many of the other recent or planned activities of the Section are documented in this issue.

This year will also see major personnel changes within the Soils Section. Appointments of Dr. S.K. Danso (Ghana) to the Section and Dr. G. Hardarson (Iceland) to the Seibersdorf Laboratory have already been made. We anticipate the Section Head position will be filled in the near future. Recruitment of two scientists to replace Drs. Bole and Ladonin who must return to their previous positions late in 1981 has recently been initiated. New people with new ideas should insure an active, vital programme in support of international agricultural research in soil science.

SOIL FERTILITY, IRRIGATION
AND CROP PRODUCTION SECTION

CHANGES IN STAFF

Dr. Y. Barrada left the services of the Joint Division as Head of the Soil Fertility, Irrigation and Crop Production Section on 30 January 1981 after sixteen years of excellent service with the IAEA. His very wide spectrum of knowledge and interests resulted in the initiation of many useful coordinated research programmes and technical assistance projects for developing countries in the fields of soil physics, irrigation, fertilizer use efficiency, cropping systems, etc. After his retirement from the IAEA he rejoined the Faculty of Agriculture of the University of Cairo, Egypt, as a part-time Professor of Soil Science.

Dr. J.S. Bole will serve as Acting Section Head until the post is filled.

Dr. S.K. Danso from the Soil Science Division of the University of Ghana joined the Section as Second Officer on 1 December 1980. His previous research activities had been involved in the ecology of Rhizobium in soil, in particular with factors affecting the abundance and competitive ability of Rhizobium. He was also involved in the use of isotopes in studies of biological dinitrogen fixation.

Dr. G. Hardarson (Iceland) has just reported for duty in the newly created training position under the supervision of the Head of the Soils Section of the Agricultural Unit of the Seibersdorf Laboratory. He will assist with the regular IAEA training courses at Seibersdorf and with the research programme of the staff and fellows at the Agricultural Laboratory. Dr. Hardarson, a soil microbiologist, has recently completed Ph. D. and post-doctoral programmes in nitrogen fixation at the University of Wales (U.K.) and the University of Minnesota (U.S.A.).

Reports on
TECHNICAL ASSISTANCE PROJECTS

A. Projects to be implemented in 1981

Seventeen new technical assistance projects dealing with the application of radioactive and stable isotopes and radiation techniques will be implemented during 1981. The projects have been planned to solve important problems related to fertilizer use efficiency, plant nutrition, soil fertility, biological dinitrogen fixation, soil moisture use and water management in Member States in Africa, Asia, and Latin America.

The Soil Fertility, Irrigation and Crop Production Section has the technical responsibility for the implementation of these projects. A brief account of the technical programmes and the nature of assistance to be provided by the IAEA are presented here.

I. AFRICA

1. Egypt

The IAEA will continue its assistance to the Department of Agriculture of Egypt's Atomic Energy Establishment subject to the contribution of additional funds from Member States. Studies dealing with nitrogen uptake efficiency as a function of fertilizer source and water management practices would be expanded by the provision of an amino-acid analyser and three man-months of expert services.

2. Ghana

The IAEA is continuing its assistance to the Ghana Atomic Energy Commission for establishing a Center for Nuclear Agriculture within the existing Kwabenya Nuclear Research Establishment. It is foreseen that nuclear techniques will play an important role in increasing fertilizer use efficiency, improving irrigation practices, plant breeding, and food preservation. The IAEA will provide assistance in the form of equipment to support this project.

3. Ivory Coast

The IAEA will provide assistance to the Institute of Rubber Research for increasing yields through the improvement of Hevea management techniques. The research will provide a physiological and biochemical basis for the selection of more productive varieties of Hevea. The assistance will be in the form of four man-months of expert service and necessary items of equipment.

4. Morocco

The IAEA is assisting the Central Station for Agricultural Research in Tangiers to implement isotope-aided research aimed at increasing sugarcane yields through improved fertilizer use efficiency. The IAEA will provide the project with an emission-spectrometer and ^{15}N -labelled fertilizer.

5. Senegal

The IAEA is assisting the National Centre for Agricultural Research at Bambey with studies of the development of rooting systems of the main field crops. The research should lead to more rational use of water and nutrients. The assistance will be in the form of additional equipment.

Assistance is also being provided to the Richard Toll Agricultural Research Center of the Senegalese Institute for Agronomic Research to increase agricultural production in the Senegal River Valley through the determination of the hydraulic properties of soils and the water requirements of the major crops. The IAEA has been requested to provide necessary equipment and two man-months of expert services.

6. United Republic of Tanzania

The IAEA is continuing its assistance to the Agricultural Research Institute, Mlingano. In accordance with the expert's recommendations, a radioisotope laboratory will be equipped, and an emission-spectrometer for ^{15}N determinations will be provided. Six man-months of expert service will be utilized to set up the laboratory and initiate research using radioactive and stable isotope techniques.

7. Zambia

The IAEA will provide assistance to the Central Agricultural Research Station of the Department of Agriculture for the soil moisture and water use efficiency studies using nuclear techniques. The assistance will be in the form of six man-months of expert service and some additional equipment.

II. ASIA

1. Republic of Korea

In 1980 the IAEA provided equipment for the establishment of an isotope laboratory for the application of radioisotopes

and radiation in agricultural research at the National University of Che-ju. As a first step in the initiation of research at the new facility, studies are to be carried out on soil-plant relationships and fertilizer use efficiency in volcanic soils. The assistance will be in the form of six man-months of expert services.

If additional contributions of funds become available from Member States, assistance will also be provided to the Office of Rural Development. The project would be aimed at increasing food production through the development of rational land use practices, the promotion of more efficient water use and the introduction of adequate soil and water conservation measures. The assistance would be in the form of equipment, including surface moisture and density gauges and six man-months of expert services.

2. Malaysia

The IAEA is assisting the Malaysian Agricultural Research and Development Institute in studies on improving nitrogen fertilizer use efficiency, with particular reference to tree crops by means of ^{15}N techniques. An emission-spectrometer together with three man-months of expert service are being provided for this project.

Assistance would also be provided to the University of Agriculture of Malaysia, subject to the availability of funds for studies of the moisture characteristics of various soils for the scheduling of irrigation and for the improved management of upland agricultural crops. The assistance would be in the form of two man-months of expert service and a neutron moisture probe.

3. Pakistan

Assistance is being provided to the Nuclear Institute for Agriculture and Biology for research to determine turnover rates of carbon from organic matter additions in saline soils. The investigations will include the use of ^{15}N and ^{14}C . The IAEA will provide an automatic sample oxidizer and an infrared gas analyser.

4. Philippines

The IAEA will provide assistance, if additional contributions from Member States of funds or service become available, to the Bureau of Soils to improve phosphorus fertilizer use efficiency in multiple cropping systems. Counting equipment and two man-months of expert services would be made available for this project.

III. LATIN AMERICA

1. Bolivia

The assistance to be provided by the IAEA to the Division of Radioisotope Application of the Bolivian Nuclear Energy Commission (for the three-year period 1981-83) has the goal

of increasing wheat and potato production through soil and fertilizer availability studies using ^{15}N and ^{32}P as tracers. In 1981 the assistance will be in the form of two man-months of expert service and equipment needed for this project.

2. Brazil

The IAEA will continue to assist the multi-year UNDP/IAEA project of the Centro de Energia Nuclear na Agricultura, Piracicaba. Six man-months of expert service and equipment will be provided for this project in 1981.

3. Panama

The IAEA is assisting the Government of Panama to increase agricultural production through creating an infrastructure for the utilization of nuclear techniques in agriculture. The project will focus on such topics as fertilizer use in different crops and pastures and the evaluation of water behaviour in the soil. The duration of this project will be three years (1981-83). The assistance in 1981 will be in the form of three man-months of expert services and equipment.

4. Uruguay

The IAEA will provide assistance to the Faculty of Agronomy of the University of the Republic, Montevideo, for assessment of fertilizer nitrogen management practices and studies on soil and fertilizer nitrogen dynamics. Six man-months of expert service, an emission spectrometer and a phytotron are being provided for this project.

TECHNICAL ASSISTANCE ADVISORY MISSIONS

Dr. Y. Barrada undertook a mission to Senegal, Mali and Ivory Coast on behalf of the Division of Technical Assistance from 30 November to 18 December 1980. The progress of current technical assistance projects and results of those recently finalized were discussed with local scientists. The previous issue of the Newsletter reported on the research projects in Senegal and the Ivory Coast. Plans for projects to be implemented in 1981 were finalized and the role the IAEA could play in supporting future research was explained to scientists at several institutions and to local Government officials.

FELLOWSHIPS

Each year, a number of fellowships are awarded to scientists from developing countries to receive intensive training in the use of stable and radioactive isotopes in soil-plant nutrition studies within the regular fellowship programme of the Department of Technical Assistance of the IAEA. The Agricultural Unit of the Seibersdorf Laboratory participates actively in this programme by providing

training in the field of research in which it is active. Fellows normally are expected to attend the Interregional Training Course on the Use of Isotopes and Radiation Techniques in Soil-Plant Relationships. They then receive training for varying periods of time specific to the needs of their future research programme. Normally such fellows are expected to carry out definite projects on their own, as part of their training.

There will be seven new IAEA fellows at the Seibersdorf Laboratory this year. They are: Mr. Goyenola from Uruguay, for 2 months; Mr. Carmona from Mexico, for 3 months; Ms. Augustin from the Philippines, for 4 months; Ms Lepenckas from Peru, for 6 months; Mr. Nyembo from Zaire, for 6 months; Mr. Kara-Barranga from Zaire, for 12 months; Mr. Mitrosuhardjo from Indonesia, for 12 months. All fellowship requests must be approved by the candidate's Government and are submitted through the local authority responsible for IAEA matters.

Report on the
FAO/IAEA/SIDA RESEARCH COORDINATION MEETING ON
THE USE OF ISOTOPES IN STUDIES ON BIOLOGICAL DINITROGEN FIXATION

The second annual meeting of participants and consultants for the FAO/IAEA/SIDA Coordinated Research Programme on the Use of Isotopes in Studies on Biological Dinitrogen Fixation took place at the Vienna International Center, Vienna, Austria from 12-19 January 1981. Sixteen participants in the programme from Argentina, Australia, Brazil, Egypt, France, Federal Republic of Germany, Greece, Iceland (consultant), India, Kenya, Nigeria, Pakistan, Senegal, Sri Lanka, U.K. and the U.S.A. attended the meeting. A representative of the Swedish International Development Agency (SIDA), the sponsors of the programme, was present at the RCM, as well as a representative of the Food and Agriculture Organization of the United Nations. The meeting, which was chaired by Dr. M. Fried, was opened with an address by Prof. M. Zifferero, Deputy Director General, Department of Research and Isotopes of the IAEA. Dr. S.K.A. Danso served as the Scientific Secretary of the meeting.

Results of experiments carried out in 1979 and 1980 were presented and critically evaluated. As a result of these field experiments, it was possible to quantitatively measure the depression in the amount of N fixed by the application of 100 kg N fertilizer as compared to the 20 kg/ha starter application. The amount of N fixed was shown to be affected to a lesser extent by mineral N in certain species of legumes than in others. Furthermore, within a particular legume species, the impairment of the N-fixing potential at high N levels was less marked in some varieties than in others.

Results of the effect of P supplementation on the amount of N fixed and the yield of some grain legumes were presented. In many instances, stimulation of N fixation was quantitatively measured, while some of the findings showed no response to P fertilization in terms of either N fixation or yield of legume. The discrepancy in these findings could generally be explained by the different levels of available P in the soils.

Sudan grass as a control crop consistently gave lower values for the quantity of N fixed by legumes in comparison with other control

crops. Either Sudan grass fixes nitrogen itself, and as a result underestimates the N fixed by a legume, or Sudan grass does not meet the requirements of a control crop, or both. Reports on associative symbiosis in grasses and sugarcane were presented.

From the results presented, the potential for using ^{15}N to screen varieties of legumes to maximize N fixation became evident. The meeting thus decided that the 1981 studies would involve tests of the ability of different varieties to fix nitrogen under (a) low inorganic N levels; (b) high levels of fertilizer N. It is hoped that varieties of plants capable of fixing a high percentage of their N requirement under a wide range of N levels would be identified. Such varieties would be of immense value in intercropping systems, in crop rotations, as well as in soils having a high N status or mineralization rate.

Report on the
FAO/IAEA RESEARCH COORDINATION MEETING ON ISOTOPE AND
RADIATION TECHNIQUES FOR EFFICIENT WATER AND FERTILIZER USE
IN SEMI-ARID REGIONS

Fifteen participants in the coordinated research programme met in Vienna from 23-27 March 1981 for the first research coordination meeting of the programme. Scientists reported on their research activities since the initiation of the programme and discussed their plans for the forthcoming year.

The programme will remain focused on the use of various crop rotations or cultural practices to influence the supply of available soil water. The interaction between water use efficiency and N fertilizer utilization will be investigated with ^{15}N -labelled fertilizers.

The meeting benefited from the presence of Dr. Y. Barrada, who until his recent retirement was in charge of the programme, Dr. W.O. Willis, who assisted to set the guidelines for the programme in 1978, and Dr. D.R. Nielsen, who acted as Chairman for the meeting.

WORKSHOP ON THE USE OF ^{15}N IN SOIL-PLANT NUTRITION INVESTIGATIONS

This Workshop was held at the Vienna International Center from 19-23 January 1981 and followed immediately after the Research Coordination Meeting on Biological Dinitrogen Fixation. The timing of the Workshop was thus opportune for participants of the RCM on Dinitrogen Fixation. The Workshop was funded by SIDA and GSF.

The objective of the Workshop was to acquaint scientists involved in the use of ^{15}N for soil-plant nutrition studies with the latest developments in this field and to familiarize them with all the necessary calculations.

In all, there were twenty-five participants from nineteen nations. Fourteen of the participants were involved in the SIDA-funded Biological Nitrogen Fixation Programme while five were participants in the GSF-funded Programme on Nitrogen Residues.

It was a pleasure to have two participants from the People's Republic of China, Drs. Wen Xian-fang and Ma Zhanglin, sponsored by their Government. Dr. K. Jung from the German Democratic Republic and Dr. A. Xenoulis from Greece also participated in the Workshop at the expense of their respective Governments. In addition, Mr. Charanek from Lebanon and Ms. Afza from Bangladesh, both fellowship trainees at the Seibersdorf Laboratory attended all the lectures.

The language of instruction was English, and lectures were delivered by Dr. M. Fried, Director of the Joint FAO/IAEA Division and Dr. H. Broeshart of the Seibersdorf Laboratory. Dr. Zapata also of the Seibersdorf Laboratory assisted in the calculations of data while Dr. Danso of the Soil Fertility Section of the Joint FAO/IAEA Division acted as Technical Officer for the Workshop.

The following topics were covered at the Workshop:

- (1) Justification of the use of isotopes in soil-plant nutrition studies, illustrated with practical examples.
- (2) ^{15}N terminology, such as % atom excess and % abundance of ^{15}N in soil and fertilizer.
- (3) The analytical aspects of ^{15}N - theory of emission-spectrometry and mass-spectrometry with a brief introduction to sample preparation for ^{15}N analysis.
- (4) "A"-value concept - the basis for this concept was explained.
- (5) The use of ^{15}N in experiments with and without interaction. Fertilizer placement studies with N and P were demonstrated.
- (6) The application of the "A"-value concept in studies of biological nitrogen fixation.
- (7) Calculations - parameters such as the percent and total amount of nitrogen derived by a crop from fertilizer, soil, and other sources were calculated with the participants, using actual experimental data. Participants were then given experimental data and calculated the results.

The Workshop proved to be so valuable that it is planned to hold workshops of this nature for participants in other coordinated research programmes.

Report on the
FAO/IAEA ADVISORY GROUP MEETING ON THE USE OF NUCLEAR
TECHNIQUES IN IMPROVING PASTURE MANAGEMENT
10-14 November 1980, Vienna

An Advisory Group of 15 scientists from 9 Member States and international organizations documented the importance of pasture systems in international agriculture and the constraints to increasing pasture production. Management practices to increase effective soil-water storage were discussed, and programmes of research using neutron moisture probes to determine the effectiveness of such practices were developed.

Limiting plant nutrients, especially the supply of available nitrogen, was also recognized as an important constraint. Management of the legume/non-legume association to maximize fixation of atmospheric nitrogen is the most economical way of supplying nitrogen. Considerable attention was given to discussing the methodology of using ^{15}N to quantify nitrogen fixation in pasture systems.

The Advisory Group recommended the establishment of a coordinated research programme involving nuclear techniques to study the conservation of water and the supply of available nitrogen to pasture systems. Plans for scientifically sound research projects were developed. Although lack of funds have delayed the initiation of a coordinated research programme, it is hoped that one will be initiated in due course. Scientists requesting a copy of the recommendations or wishing to be notified should such a programme be initiated may contact the Soil Fertility Section. It is hoped that the proceedings of the meeting will be published by the IAEA in the near future.

SOILS RESEARCH AT THE AGRICULTURE SECTION,
SEIBERSDORF LABORATORY

Symbiotic Nitrogen Fixation by Grain Legumes under Field Conditions

The Seibersdorf Laboratory continues to be active in research supporting the coordinated programme on biological nitrogen fixation. In 1980, research was carried out to find the time-course for N fixation by faba beans (*Vicia faba*) and soybeans (*Glycine max*). The experiments were harvested over 8 physiological stages of growth of the crops, from mid-vegetative growth stage to maturity. In faba beans, N fixed at mid-vegetative growth stage was very small and thus formed a low percentage of the total N in the plant. However, N fixation increased tremendously from the period of first flower or maximum vegetative growth phase up to mid-pod filling stage. By maturity, the N derived from fixation accounted for 78% of the N yield in faba bean plants. Soybean similarly did not fix much of its nitrogen in the early growth stages. Nitrogen fixed became significant from the 50% blossoming period up to maturity stage. Thus N fixation started at a later period than in faba beans, and at harvest time, the percentage of N derived from fixation in soybeans was 47% as against 78% for faba beans.

The effect of the method by which ^{15}N fertilizer was applied on the estimate of amounts of N fixed was also studied. It was found out that whether the ^{15}N fertilizer was applied as a band, broadcast, or as a solution, the amount of fixed nitrogen as estimated by the ^{15}N technique was the same when the plant was harvested at 50% blossoming stage and also at mid-pod filling stage. However, when harvested at mid-vegetative stage, the amount of nitrogen fixed was higher when the ^{15}N was banded than when broadcast or applied as a solution. For this reason, as well as for the fact that seed N contribution to the total plant is significant in the initial growth stages and complicates interpretation of the results obtained, estimating N fixed by legumes very early in their growth stages is not recommended under field conditions.

Another experiment was designed to determine the effect of applying nitrogen fertilizer at different physiological growth stages on the N-fixing capability of faba bean. The amount of N estimated as fixed was not changed by the timing of the fertilizer application.

FAO/IAEA/SIDA INTERREGIONAL TRAINING COURSE ON THE USE OF ISOTOPE
AND RADIATION TECHNIQUES IN STUDIES ON SOIL-PLANT RELATIONSHIPS

This year's course, which will be held from 6 April to 5 June 1981, will be the fourth hosted by the Seibersdorf Laboratory in four consecutive years. Participants are selected from scientists nominated by developing Member States who are working in some aspects of soil fertility, in which the application of isotopes is an asset. Lectures and practical instructions are provided in the use of both stable and radioactive isotopes in studies on fertilizer and soil nutrient uptake by plants. Among the topics covered are:

- a) Introductory lectures to provide an understanding of isotopes and their application in research, with particular reference to agriculture;
- b) The theory of isotope detection, and precautions to take to insure safety when handling radioisotopes and nuclear equipment;
- c) The "A"-value concept and its application in studies of biological nitrogen fixation;
- d) Efficiency of fertilizer use by plants;
- e) Soil physics and water use efficiency studies using neutron soil moisture probes and gamma soil density equipment;
- f) Practical studies involving field experiments, using both stable and radioactive isotopes and detection equipment.

Lectures are delivered in English, and it is thus essential that applicants should have no difficulty in following lectures and expressing themselves in English. This year, nineteen trainees from seventeen Member States of the IAEA are expected to participate. A report of the course will be included in the next Newsletter.

Report on the
INTERREGIONAL TRAINING COURSE ON THE USE OF ^{15}N
IN SOIL SCIENCE AND PLANT NUTRITION

The Interregional Training Course on the Use of ^{15}N in Soil Science and Plant Nutrition will be held from 18 May to 12 June 1981 at the Zentralinstitut fuer Isotopen- und Strahlenforschung, Leipzig, German Democratic Republic.

The objective of the course is to train scientists from developing Member States in all aspects of the use of ^{15}N -enriched or depleted fertilizers in soil and plant nutrition studies.

Forty-one nominations have been received by the IAEA from candidates officially sponsored by twenty-nine Member States. Eighteen candidates will be selected for participation in this course by the selection panel in the near future.

A full report on the course will be published in the next issue of the Soils Newsletter.

FAO/IAEA TRAINING COURSE ON THE USE OF RADIATION EQUIPMENT
FOR SOIL MOISTURE AND IRRIGATION STUDIES

Candidates are now being selected from the many applications received for the Training Course on the Use of Radiation Equipment for Soil Moisture and Irrigation Studies. The course will be held at the Centre d'Etudes Nucleaires de Cadarache, Saint-Paul-lez-Durance, France, from 22 June to 10 July 1981.

The course, which will be given in the French language, is primarily planned for technicians who have had a few years of practical experience. Participants will receive lectures on the basic principles of the equipment and will have the opportunity to use neutron moisture meters and density probes in field studies. Emphasis will be placed on such basic practices as proper placement of access tubes, calibration of the equipment and the precautions necessary to avoid radiation hazards. The next issue of the Soils Newsletter will contain the full report on the course.

Announcement of the
INTERREGIONAL TRAINING COURSE AND STUDY TOUR ON THE
APPLICATION OF NUCLEAR TECHNIQUES IN AGRICULTURE

- Place: Timiryazev Agricultural Academy, Moscow and several Republics of the Soviet Union
- Time: 25 May - 21 June 1981
- Organizers: International Atomic Energy Agency in cooperation with the USSR State Committee on the Utilization of Atomic Energy and the Timiryazev Agricultural Academy
- Language: Russian and/or English
- Purpose: The objective of the course is to provide training to scientists from developing Member States in the field of isotopes and radiation techniques used in different agronomical subjects. The participants will receive training in the characteristics of isotopes and radiation, radiobiology, radiation safety techniques and standards, methods of radiation detection and radioisotope assay. Participants will then be trained in the application of isotopes and radiation in agrochemistry, soil science, biology, entomology, ecology, plant breeding, plant physiology and biochemistry, plant protection and food preservation.

Report on the
INTERREGIONAL TRAINING COURSE ON THE APPLICATION OF NUCLEAR
TECHNIQUES IN AGRICULTURE

The Interregional Training Course on the Application of Nuclear Techniques in Agriculture was held during 1 September to 30 November 1980 at the Timiryazev Agricultural Academy, Moscow, USSR. The course provided intensive training on the use of radioactive and stable isotopes and radiation techniques in different fields of agricultural research to scientists from developing countries.

Twenty-two scientists from Bolivia, Bulgaria, CSSR, Egypt, Ghana, Iraq, Democratic People's Republic of Korea, Lebanon, Poland, Romania, Syria, Turkey, Vietnam, Zaire and Zambia participated in the course. Mr. P. Schultze-Kraft from the IAEA opened the course. Dr. M. Fried, Dr. H. Broeshart, Dr. V. Ladonin, and Dr. M. L'Annunziata, staff members of the IAEA, Prof. V. Rachinskij, Director of the course, and staff members of the Host Academy delivered lectures related to their specific expertise. The programme of the course included lectures, laboratory experiments, time for discussion, scientific visits and excursions. The lectures and laboratory experiment emphasized the theoretical and experimental aspects of the use of nuclear techniques in agricultural research. The course covered radiation safety techniques, the use of radiochemical and nuclear physics methodology in agrochemical analysis, and the use of isotopic tracers in plant nutrition, plant physiology and radiobiology. Examples were given of research to improve fertilizer management practices and irrigation techniques.

During the course participants had an opportunity to discuss possible cooperation with the IAEA in their future work. The study tour in connection with the training course visited research institutes in Tashkent and Uzbekistan.

COMING EVENTS

FAO/IAEA Research Coordination Meeting on the Use of Nuclear Techniques in the Development of Fertilizer and Water Management Practices for Multiple Cropping Systems. The first research coordination meeting of this group of nine research contract and one research agreement holders will be held in Vienna. The participants will report on their research activities during the initial year of the programme. The research objectives and an experimental plan for the next cropping season will be developed based on results obtained and the needs of scientists studying multiple cropping systems.

Vienna, Austria
14 to 18 September 1981

FAO/IAEA Workshop on New Concepts in the Use of ^{15}N and Radioisotopes in Studies of Plant Nutrition. Invited participants who are involved in coordinated research programmes related to plant nutrition will spend a week reviewing the theory and practice of tracer techniques.

Vienna, Austria
21 to 25 September 1981

FAO/IAEA Research Coordination Meeting on Isotopic Tracer-Aided Studies on the Role of Herbicides and Related Chemicals in Soil and Fertilizer Nitrogen Management. The first meeting of this group of 4 contract and 6 agreement holders will be held in Vienna from 28 September - 2 October 1981. The participants will discuss the initial research results, consider ways and means for overcoming the problems encountered, and develop future research plans.

Vienna, Austria
28 September -
2 October 1981

RECENT PUBLICATIONS

1. "Nuclear Techniques in the Development of Management Practices for Multiple Cropping Systems" (Proceedings of the FAO/IAEA Advisory Group Meeting on Nuclear Techniques in Development of Fertilizer and Water Management Practices for Different Cropping Systems, held in Ankara, Turkey, from 7-12 October 1979) - IAEA-TECDOC 235.
2. "Isotope and Radiation Techniques in Soil and Water Conservation Studies in Africa" (Proceedings of the Regional FAO/IAEA Seminar on the Use of Isotopes and Radiation Techniques in Soil and Water Conservation Studies in Crop Production for Developing Countries in Africa, held in Khartoum, Sudan, from 12-17 November 1979) - IAEA-TECDOC-236.
3. "Zinc Fertilization of Flooded Rice" (Results of a five-year FAO/IAEA coordinated research programme using ⁶⁵Zn-labelled fertilizer conducted in ten countries) - IAEA-TECDOC -242.

NOTE: A few copies of these cost-free technical documents are available to interested scientists. They can be requested from the Head of the Soil Fertility, Irrigation and Crop Production Section.

4. "Soil Nitrogen as a Fertilizer or Pollutant" (Report and Proceedings of the Fourth Research Coordination Meeting of the FAO/IAEA/GSF Coordinated Research Programme on Agricultural Nitrogen Residues held in Brazil, 1978) - Price: A.S. 630.-
Number: STI/PUB/535.

Soils Newsletter

Joint FAO/IAEA Division
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