using wheat data. These studies will be followed by tests on barley, oats, and rice. The results will be considered by the FAO-IAEA Working Group which, in December 1965, set up the project under the auspices of the Joint FAO/IAEA Division in cooperation with the FAO Division of Plant Production and Protection. Tests on the use of the master record in field experiment applications have also been initiated. Based on computer programmes and procedures now being applied in the States of Washington and Montana, U.S.A., field record books for recording data have been prepared for use by cooperators in several international field experiments. These trials include FAO/IAEA Coordinated Experiments on Rice Nutrition being conducted in 12 countries of Southeast Asia, FAO/IAEA/IRRI Cooperative Rice Mutant Yield Trials conducted in 8 countries, as well as in the FAO/IAEA Uniform Durum Wheat Mutant Trials conducted in 12 countries, under the FAO Near East Wheat and Barley Improvement and Production Project.

Acceptance of this standardized system by field workers, and the uniformity of results obtained from the studies conducted to date, have been encouraging. The second series of trials is now in progress.

Further information on the progress of these activities and sample copies of the test forms may be obtained by writing to the authors.

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2. International programmes on the use of radiation and isotopes in plant breeding and genetics research.

In the fall of 1964 the Food and Agriculture Organization of the United Nations and the International Atomic Energy Agency joined forces for promoting international cooperation to foster the use of nuclear techniques in food and agriculture, by establishing a Joint FAO/IAEA Division located in Vienna.

Engaged in every field of food and agricultural sciences, the Division has a Section dealing with Plant Breeding and Genetics. This Section has three primary field s of interest: (1) to promote and coordinate research leading to the development of more effective methods of inducing and utilizing mutations, (2) to foster cooperation between and

render assistance to mutation workers engaged in breeding some of the world's major food crops, (3) to arrange for systematic international testing of induced mutants in some major food crops, and to standardize and mechanize methods of recording and analyzing data in international trials and mutant collections.

In addition, the Section has technical responsibility for various projects of Technical Assistance to developing countries and technically supervises scientific meetings, training courses and publications in this field. In its work the Section cooperates with other related sections of the FAO as well as with such organizations as EUCARPIA and EURATOM.

A Laboratory Section has also been established at Seibersdorf near Vienna. This Section is primarily engaged in servicing the various international programmes by treating seeds with mutagens, doing basic research for development of new programmes and training fellows in mutation methods.

During the first two years of its operation, the Section, in accordance with its three primary interests, has developed the following programmes:

1. A Coordinated Programme of Research on the Production and Use of Induced Mutations in Plant Breeding. This programme has 17 main participants working under agreement or contract with the IAEA and several associates in countries in Asia, Europe, and North and South America. Coordination is maintained at periodic meetings, the first having been held in Vienna in January 1966, and the second scheduled to be held also in Vienna, in September 1967. The proceedings and recommendations for coordination made at these meetings are published. This group, which is mainly engaged in cereal work (rice, wheat, barley, oats, maize), also serves as a body of advisors to the plant breeding and genetics programmes of the Joint Division and is in addition preparing a Manual on Mutation Breeding which is primarily intended for use in training courses and by plant breeders in developing countries.

A Neutron Seed Irradiation Programme is in the process of getting under way. Its primary objective is standardization of methods of exposing seeds to neutrons in reactors and of measuring and reporting dose. Under contract with the IAEA and in collaboration with FAO/IAEA staff, the Austrian Atomic Energy Research Organization has developed a seed irradiation facility (lead and boron pot with a revolving specimen capsule) for use in pool-type reactors. Recommendations for standardized methods of measuring and reporting of dose have been developed by groups of biology, chemistry and physics experts. Contracts have been concluded with several countries to install the irradiation facility and to carry our coordinated studies. The IAEA laboratory at Seibersdorf is perfecting a technique of using barley seedling growth as an indicator of biological response for comparing different reactors. The first coordinating meeting was held in Vienna in July 1966; a working group meeting was held in December 1966, and the second coordinating meeting is planned for October 1967. Other studies within this programme will include radiosensitivity to neutrons of crop species and use of neutrons for induction of useful mutations.

2. A Coordinated Programme on the Use of Induced Mutations in Rice Breeding. There are nine participants in this programme, who hold research contracts with the IAEA. They are mostly in Southeast Asian countries; one in Latin America. This group cooperates closely with the International Rice Commission in Bangkok and the International Rice Research Institute in the Phillippines. The first coordinating meeting was held in Bangkok in 1965 and the second in Manila in 1966. The proceedings and recommendations are reported to the IRC and published in the IRC Newsletter. The third meeting is scheduled to be held in Taipei in June 1967. Through the work of one of the participants a new mutant rice variety named "Rei Mei" has been released in Japan, excelling mainly in stem strength. Another line produced by him reaches maturity 50 days earlier than the mother variety. Several other promising mutant lines of rice have been produced by the other participants.

In cooperation with the Seibersdorf laboratory, research is being carried out in Africa and Latin America on induction of disease resistance in wheat with emphasis on Septoria.

Plans are being made to develop coordinated research programmes dealing with the use of induced mutation for improvement of protein-rich crops and to improve protein quality and quantity of grain crops.

3. Under the framework of the FAO Near East Wheat and Barley Improvement and Production Project and in cooperation with the Italian Nuclear Research Center at Casaccia, Uniform Regional Trials of durum wheat mutants and controls are conducted in a number of countries of Southern Europe, North Africa and the Near and Middle East. The mutants, developed by Dr. G. T. Scarascia, have shown excellent performance in all these trials, outyielding local and common controls.

Under the framework of the Coordinated Rice Mutation Breeding Programme and in cooperation with the International Rice Research Institute, Uniform Regional Trials of indica rice and observation plot tests of japonica rice have recently been conducted in a number of Southeast Asian countries. The results are not known but the trials will be continued.

In cooperation with the Plant Production and Protection Division of FAO and the International Biological Programme, work is being developed towards standardization of crop research records and mechanization of processing. Several study groups, led by C. F. Konzak, have met to discuss the development of standard record formats and procedures. The Joint Division's Uniform Regional Trials already make use of computer-printed field books under this system. Formats are being developed for recording mutant and other genetic stock collections for computer handling. Adaptation studies, led by K. W. Finlay, are being standardized under the IBP and FAO and the FAO hopes eventually to establish world-wide germ plasm collection records.

Other activities by the Joint Division and its predecessors in this field have included a Technical Meeting on the Use of Induced Mutations in Plant Breeding, held in cooperation with EUCARPIA in Rome 1964, a Symposium on the Use of Isotopes in Plant Nutrition and Physiology held

in 1966, also in cooperation with EUCARPIA, and together with the organizers of the XIth Pacific Science Congress a Symposium on the Use of Isotopes and Radiation in Agriculture. During the first two years of this joint venture of FAO and IAEA, a number of international programmes has been established, which have fostered cooperation among scientists the world over. The resulting coordination in some of the fields dealt with has already contributed to more rapid progress in the use of nuclear methods in agricultural research and has helped to place this technique in its proper perspective as an important and unique additional tool to further research towards more and better food.

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1. Spm regulation of Diffuse and mosaic pericarp.

Preliminary evidence presented in the M.G.C. News Letter last year suggested that mosaic pericarp and Diffuse may be regulated by an Spm-like element. Further studies make this suggestion unlikely. Neither p^{mo} nor Idf are consistently associated with regulation of the gene action of a^{m-1}, a gene known to be regulated by Spm. The 1966 test ears were again confusing. Spm-like elements are present in both the stock carrying p^{mo} and the stock carrying Idf, but there does not seem to be a one to one relationship. That is, ears with the Diffuse phenotype do not always regulate the action of a^{m-1} as though they carried Spm, and Spm is not always absent in non-Diffuse ears. The frequent presence of strong Spm-like regulators in these stocks remains unexplained.

R. I. Brawn

2. Pericarp phenotype of a^{m-1}.

The mutable allele a^{m-1} produces a pale aleurone color in the absence of Spm (with A_2 C_1 C_2 R) and colorless aleurone with deep spots when Spm is present. In combination with the pericarp allele p^{rr}, this allele acts as a full recessive to give strong brown pericarp color both with and without Spm and not an intermediate red-brown as its aleurone color interaction would suggest. In the presence of Spm, red stripes are present. One ear of the genotype a^{m-1} p^{rr} Idf Spm has been observed. It has strong brown pericarp with frequent colorless sectors typical of the Diffuse phenotype and frequent red stripes due to the response of a^{m-1} to Spm.