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RECENT CONFERENCES ON PLANT DISEASES AND PROTECTION

- USSR -

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RECENT CONFERENCES ON PLANT DISEASES AND PROTECTION

The Problem of Immunity

[This is a translation of an article by M. S. Dunin in Zashchita Rasteniy ot Vrediteley i Bolesnoy (Protection of Plants from Pests and Diseases), No. 1, Moscow, 1960, pages 59, 60.]

The III All-Union Conference on Plant Immunity took place in Kishinev in September 1959. For the short period that passed since the II Conference occurred in Moscow in March 1958 the Soviet investigators accumulated much new and varied experimental data. This made up the contents of 112 reports. An active part in the conference was taken by scientists from Bulgaria, Roumania, and in absentia, as co-authors of reports, by scientists from China and Hungary.

The plenary sessions considered the theoretical bases of plant immunity to the most important diseases and pests. The report of Acad. P. M. Zhukovskiy was dedicated to the botanico-geographical and genetic consistencies of plant immunity to diseases, and the application of such regularities in selection work. Basing his statement on his analysis of the new investigations and on the data supplied by the VIR expedition into Central and South America, Zhukovskiy showed that in selecting plants for immunity to certain diseases it is most expedient to look for initial disease resistant plant forms in those sections of the earth's globe where the diseases have long been widely spread.

Acad. Trayan-Savulesku (Roumania) and Prof. Dodov (Bulgaria) recounted the present state of phyto-immunological work in their respective countries. In the report of the Hon. Vaskhil Acad. T. D. Strakhov and the accompanying reports by a series of his associates (T. V. Yaroshenko and others) investigating the mechanism of plants' physiological immunity to infectious diseases they demonstrated biological uniformity in the processes of destroying the mycelia of smuts, rusts, and other fungi as these react to unfavorable conditions (in pure culture) and to attack by a resistant plant.

Prof. D. D. Berderevskiy dedicated his report to an

expansion of I. I. Mechnikov's concept of non-specific immunity in organisms and a description of the part played by anti-biotic plant substances as immunity factors.

Prof. F. V. Khetagurova presented considerations of material importance about the part played by anti-biotically active substances in effecting immunity to bacteriolysis. These are of special interest for setting up a basis and for making practical use of anti-bacterial immunity in seed selection work.

The reports of Prof. M. V. Gorlenko, Prof. T. I. Fedotova, Prof. M. S. Dunin and his associates from ChNR (Candidate of Sciences Li Chen-ch'ih and Lou Wen-Ch'ing) are devoted to questions of variations, parasitic specialization, and the phenomena of adaptation by phyto-pathogenic organisms. Of decisive importance in these phenomena are often the qualities of the host plant. They show that the host plant plays a double role. As a unique "chooser" it "selects" from a genetically diverse parasitic population and thus aids in the multiplication and distribution of those biological types which are best adapted to the given species, or to others that are immunologically near to it. Not less, or perhaps even more important, is the part played by the specific and typical qualities of the host plant. Under certain conditions these may bring about new biological types (races) of the parasites, as a consequence of their adaptive changeability, adequately directed by a certain kind of host.

The majority of the reports at the plenary and specific sessions were mainly devoted to the inborn immunity in plants before contact is made with a disease stimulant. M. S. Dunin's report on plant immunity to virus diseases discusses its theoretical basis, and its mechanisms, and describes the practical meaning of protective reactions in acquired plant immunity not only to phyto-pathogenic viruses but also to stimulators of other infectious diseases.

Of great interest are facts reported by Prof. Sukhorukov. They witness to the capacity of plants to produce specific anti-bodies which, for example, when fungal poisons are introduced would slow down or completely stop any harmful reaction on the plant.

A general study of the factors and mechanisms of inborn immunity and protective reactions (acquired immunity) in plants makes clear the importance of respiration and those biochemical means by which these processes are accomplished. All this is convincingly shown by the report of Prof. B. A. Rubin.

At this conference, just as at the last one, only a

small number of reports dealt with results of study of plant immunity to pests. The report of Prof. P. G. Chesnokov reviewed the subject as a whole, while that of Prof. Ya. I. Prints was on the topic of grape vine immunity to Phyloxera.

Discussions of a series of individual questions were concentrated in section meetings. The main report of Prof. F. Ye. Nemlienko and the accompanying papers of Prof. N. A. Cheremisinov, K. Rafaile, K. Tush, F. Negulesku, and V. Eshanu (Roumania), A. S. Boyevskiy, N. S. Salunskaya, K. I. Kuporitskaya, and others were devoted to the immunity of maize. These clearly showed the multiform possibility to increase greatly the immunity of corn to disease and pests; to raise and improve the yield of this most important crop by developing resistant varieties, by applying new practices in phyto-pathological tests and through the use of agro-technical and chemical means that strengthen the disease resistance of corn plant.

The basic report on the immunity of spiked grains was given by Prof. E. E. Heshel. It was accompanied by papers and dispatches from Prof. Ye. Radulesku (Roumania), Prof. M. N. Yakubtsiner, Acad. T. D. Strakhov, I. V. Grechko, Prof. L. L. Dekaplirevich, Prof. M. S. Dunin and I. Sepeshshi (Hungary), Yo. A. Fialkovskoy, O. N. Voytchishina, V. V. Shopina, and others. They gave new data from the study of immunity in the grain plants; the testing of the stability of their varieties; and the use of micro-elements and other means for improving the immunological properties and yield of the bread cereals.

The basic report of Cand. of Biol. Sci. N. V. Kovalev about immunity in fruit and grape husbandry showed the importance of plant resistance to most of the widely distributed and harmful diseases (scab, Black rot, etc.) In this connection the most important problem is the study and making use of (by selection) the resistant varieties which appear among the rich assortment of fruit and berry plants and their wild relatives. Simultaneous with the study and recognition of disease resisting varieties an investigation was made into various agri-technical and chemical means for increasing plant resistance to different infectious diseases (supplementary reports of I. I. Vanin, V. N. Bogdanova, A. M. Sokolov, I. I. Belous, E. P. Kropis, and others).

In the report of Prof. D. D. Verderevskiy supplemented by V. V. Zotov, I. N. Naydenova, A. A. Min'ko, V. M. Gureyeva, and a number of others they discussed the results obtained by perfecting methods for determining the resistance of the grape vine, and by developing forms resistant

to such especially dangerous diseases and pests as mildew and Phyloxera. In the experimental plots, and partly also under field conditions, they found varieties able to resist and bear the Phyloxera. Growing on their own rootstocks these varieties develop and bear fruit in a very harsh Phyloxera environment as could be seen, for example, in some of the kolkhozes of Moldavia SSR and in the All-Union Anti-Phyloxera Station in Odessa.

The subject of immunity in vegetables and potatoes was dealt with by the review of A. Ya. Kameraz who listed the most important results and opportunities in selecting potatoes resistant to fungus and virus diseases. The supplements of Prof. P. G. Chesnokov, S. N. Moskovets, N. M. Shcherbakova, Ye. N. Mukhina, and others presented factual data about methods used in testing potatoes for disease resistance, and in evaluating a number of varieties for resistance to Phytophthora, to canker and other diseases. They also reported the initial results of their work on developing varieties of potatoes resistant to virus diseases and to the Colorado beetle.

The reports of Ye. A. Osnitskaya and supplements of Prof. Teternikovaya-Babayan, Prof. S. N. Moskovets, T. D. Verderovskaya and Cand. of Biol. Sciences R. M. Galachian and others present the results of immunological investigations in vegetable growing. As in other branches of plant husbandry, they too obtained good results by selecting plants for immunity to virus, bacterial, and fungus diseases. They found of great value the use of agri-technical and chemical methods to increase disease resistance of vegetable varieties, primarily so in seed treatment. New laboratory methods permit a quick orientation appraisal and immunological evaluation of the initially chosen plants, and, thus, enable the grower to select disease resistant varieties of vegetables.

A special place in the efforts of the conference was occupied by the reports on the immunity of sugar beets. In the basic report of Cand. of Sci. in Agric. V. N. Shevchenko are listed great achievements, and even more significant perspectives are shown for developing sugar beet varieties which would combine disease resistance with other qualities valuable in their husbandry.

Prof. S. N. Moskovets, I. V. Popov, Z. A. Pozhar cited results obtained in an investigation of agri-technical methods which secure an increase of sugar beet resistance to damping-off and other diseases.

A review of the history, development, and present state of immunological studies; the production of cotton

varieties resistant to verticillium, and fusarium wilts; the results of a study of the variations of these most dangerous disease stimulants were given by Cand. of Agric. Sci. A. I. Solov'yeva, Cand. of Agric. Sci. K. A. Voytovich and Sh. A. Safarov related the results of developing and applying methods for the creation of an infected environment to test and (by selection) bring out varieties resistant to humus. In a severely infected zone it is possible by careful selection from old plants sensitive to humus to pick out samples which are little affected by the disease. In this connection one cannot help recollecting that analogous work on a considerable scale was done on the borderline of the XIX and XX centuries. Long experience in this work shows that new resistant varieties, obtained from old sensitive ones grown in an infected environment, quickly lose their resistance when raised as field crops.

However, it is probable that with additional measures analogous to the well known work of Acad. V. S. Pustovoyt (in selection and seed management of sunflowers) it may be possible to retain for a long time the disease resistance of new varieties obtained from old ones at a high enough level.

A considerable number of reports (Prof. V. F. Peresyphkin, Prof. S. N. Moskovets, V. Ya. Gutsulenko, N. A. Derbentsova, A. S. Rabinovoch, and others) are devoted to immunological investigations of other cultivated plants such as soya, cowpeas, pharmaceutical plants, forest varieties, etc.

The conference also gave attention to the quite important problem of preparing cadres (specialists) of improving the plant immunity courses taught in the higher schools of learning (M. S. Dunin and T. N. Shklar - "Experiment in teaching a course on Immunity of plants to diseases and pests" in the Acad. of Agric. of Timiryazen). This report outlines the principles of constructing the course, its contents, organization and methods first introduced by the Timiryazev Academy as students' course of practical laboratory studies in plant immunity. It gives the results of the students' independent immunological studies as part of their general program, and in the special phyto-pathological circle, as well as in actual practical work.

The resolution of the conference points out the urgent need to further strengthen and coordinate investigations of plant immunity; to organize joint efforts by selectors, phyto-pathologists, biochemists, and physiologists to

secure rapid introduction of varieties possessing the complex qualities of resistance to diseases and pests. It also notes the importance of expanding the study of plant resources for the purpose of introducing and using disease and pest resisting forms. The conference pointed out the need for basic improvements in the teaching methods of plant immunity courses for the schools of higher learning.

The participants in the conference made a number of quite interesting excursions to the advanced fruit and grape raising sovkhoses and kolkhoses of Moldavia SSR, to scientific research institutes, and to experiment stations and fields.

In a short review it is, of course, impossible to list more completely the contents of more than a hundred papers and reports. However, because of the efficient preliminary preparations for the conference, these data did become accessible to wide circles of specialists. "Data of the Third Conference about Immunity of Plants to Diseases and Pests" was published in eight collections with a total of 50 print sheets.

XV AFGHAN-SOVIET CONFERENCE

[This is a translation of an article by I. A. Churayev in Zashchita Rasteniy ot Vrediteley i Bolesney (Protection of Plants from Pests and Diseases), No. 1, Moscow, 1960, page 62.]

In September 1959 the regular XV Afghan-Soviet Conference on quarantine and protection of Agricultural plants took place in Kabul. The conference considered reports of USSR and Afghan delegates about the fight against Moroccan and Italian locust and against pests and diseases of cotton waged in 1958-59 on the border areas of both countries.

The conference noted with satisfaction the recent great increased quarantine work and plant protection which helped to prevent the infusion of pests and diseases from one state to another. As a consequence of stronger business ties and of the co-working of the USSR and Afghanistan there materialized the mutual execution of the 1959 campaign against the Moroccan locust in the Mazari-Sherif province of Afghanistan. The help given the USSR to its neighbor prevented damage to crops in this province and stopped the flight of the locust into other regions.

Since the multiplication of the Moroccan locust in the northern provinces of Afghanistan in 1960 still hangs as a threat over the crops of this region, and there is also the possibility of their flight into USSR territory - the conference worked out concrete measures which, when realized, should not only save the crops and prevent the flights of the pest, but should completely expose and eliminate their established breeding centers in the hard-to-reach areas. The use of the latest chemical and technical means was recommended for the purpose.

Together with other problems of protecting cotton the conference considered a plan for the mutual study of the pink bollworm in the Nangarkharsk province of Afghanistan. The list of topics for mutual investigation includes a study of the insect's life cycle; phenology of development and number of generations of the pink bollworm; a list of the plants it feeds on; the period of the larva's diapause and the dynamics of its flight as a moth; definition of the areas it invades; a study of its ways and means of spreading; development of ways to fight it and to prevent invasion of new areas. The delegates agreed on an inventory of laboratory equipment to be supplied to the Laboratory for the study of the pink bollworm to be set up in Dzhallabad.

They have lately set up special laboratories in the

Afghanistan provinces of Katlaghan and Gerat, and the conference approved the erection of fumigating chambers there. To further strengthen the plant quarantine on the lands of this country the conference recommended the development and confirmation of a catalog of the kinds of pests diseases and weeds important in quarantine work, such as is used in other countries; to be accompanied by laws necessary for the enforcement of quarantine measures.

The work of the conference was carried on a mutually friendly relationship and understanding among the parties. The participants from Afghanistan were Muhammed Karim Ziyai, Abdulla and Muhammed Anvar; the USSR was presented by I. A. Churaye, Ye. M. Shumakov, and M. G. Shamonin.

It was decided to hold the regular XVI Soviet-Afghanistan conference on plant quarantine and protection in September-October 1960 in Moscow.

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