

Arab Agronomists Union

Arab Society for Plant Protection

**SECOND ARAB CONGRESS OF  
PLANT PROTECTION**

Damascus

March 24-27, 1986

**ABSTRACTS BOOK**

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## ABSTRACTS BOOK

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THE IMPORTANCE OF INSECT ECOLOGY STUDIES IN IMPROVING PEST MANAGEMENT. V. Labeyrie,  
I.B.E.A.S. UA 340-C.N.R.S. Université de Pau. Campus Universitaire-64000 Pau/France

1

Avant de s'attaquer aux cultures ou même aux denrées entreposées, les insectes nuisibles vivaient sur des hôtes déterminés dans des habitats précis. Suivant, d'une part le degré de similitude entre ces conditions évolutives et celles créées par l'agriculture, et d'autre part la plasticité des populations d'insectes, les attaques sont plus ou moins fréquentes et plus ou moins catastrophiques. Le coût, les dangers et les pertes d'efficacité des méthodes de protection chimique ont montré la vanité des recettes miraculeuses et la nécessité d'études sérieuses sur des bases théoriques solides. La diversité des relations biocénotiques entre plantes et insectes exclut toute recette universelle, la spécificité des adaptations par sélection orientatrice de tout phénomène répétitif à périodicité régulière excluent toute solution définitive. L'agriculture en modifiant les attaques d'insectes, de nombreux exemples montrent qu'une meilleure analyse écologique permet au contraire de mieux les protéger sans risque, ni augmentation des coûts.

IMPORTANCE OF ECOLOGICAL STUDIES IN PLANT VIRUS RESEARCH. L. Bos, Research Institute for Plant Protection, Wageningen, The Netherlands.

2

With increasing expertise and facilities to detect and recognize viruses, there is an increasing awareness of the limiting role of viruses in crop production, both quantitatively and qualitatively. Moreover, modern farming systems and genetic crop constitution tend to make crops more prone to epidemic attack. Since viruses in crops cannot be directly controlled with chemical means, countermeasures are preventive only. This necessitates profound knowledge of the complicated ecology of viruses that are of direct or potential economic importance to crops. However with continuously changing agro-ecosystems, including the introduction of resistant cultivars, new problems by viruses, and other pathogens and pests are bound to continue to arise. Modern agriculture thus requires permanent support by crop protection research, including virology, and emphasizing ecological aspects.

3

THE INTEGRATED PEST MANAGEMENT APPROACH FOR PLANT PATHOGENIC NEMATODES IN EGYPT. B.A.Oteifa, Nematology Research Center, Faculty of Agriculture, Cairo University, Giza, Egypt.

Several plant pathogenic nematodes are of widespread occurrence in Egypt and the extent of their damage to economic crops has been documented. Accumulated data can be used as a guide in the selection of crop(s) that can be safely grown in nematode infested soils. Studies on the establishment of nematodes economic threshold levels; screening of cultivars and inbred lines for resistance to prevailing pathotypes; effects of cropping systems; evaluation of biological control agents; and nematicides/fertilizers response on crop yield and nematode population density are currently being conducted. The incorporation of knowledge and findings from these research components towards the development of an integrated pest management strategy under the Egyptian agroecosystem will be discussed.

4

INTERNATIONAL PATHOGENICITY SURVEY OF WHEAT LEAF RUST PATHOGEN AND SOURCES OF RESISTANCE. M.M.Bošković, Faculty of Agriculture, Novi Sad, Yugoslavia.

The importance of international investigation of wheat rusts pathogens is emphasized and organisation of these work explained. Review of the main results with international survey of Puccinia recondita tritici related to several systems and host differentials is presented. Sources of resistance and survey systems are discussed. Parasite: host: environment interactions as a whole are very complex and new approach about P:H:E informations can best be conveyed in relation to host units. Our real goal is to know genetically to the maximum extent sources of resistnace. New objectives and procedures in international survey of leaf rust fungus are explained. It is necessary to search for and document pathogenicity of Puccinia recondita tritici cultures useful in differentiating genetically different sources of resistance. Emphasis will be placed on sources of resistance and their usefulness rather than on description of pathogeniticy of fungus populations.

SEED TRANSMITTED BACTERIAL DISEASES OF CEREALS: EPIDEMIOLOGY AND CONTROL. D.C. Sands<sup>(1)</sup> and Gurbuz Mizrak<sup>(2)</sup> (1) Department of Plant Pathology, Montana State University, Bozeman, Montana, 59717, and (2) Orta Anadolu Bolge Zirai Arastirma Enst. P.K. 226, Ankara, Turkey.

5

Two bacterial diseases of cereal grains in the Middle East are bacterial leaf streak and black chaff caused by Xanthomonas campestris pv. translucens and bacterial leaf blight caused by Pseudomonas syringae. The former is a seed transmitted pathogen, virulent on almost all cultivars of wheat, barley, and triticale. Control is best implemented by use of clean seed (hot water treatment at 53°C for 10 minutes, immediately cooled and dried) and subsequent isolation of breeders and foundation seed fields. The genetics of resistance in barley is only partially defined, but promising resistant material is from Ethiopian sources. The second disease is only a problem if there are prolonged periods of moisture with near freezing temperatures. Seed treatment is not useful. Semi-selective media for both pathogens are described. Both bacteria are ice nucleation active and this phenomenon will be discussed in terms of their epidemiology and dispersal.

THE NEED FOR FRUIT CROP SANITATION PROGRAMS IN THE MEDITERRANEAN/NEAR EAST COUNTRIES. M.Tahir, Plant Protection Service, FAO, Rome, Italy.

6

Fruit crops, such as citrus, stone fruits and grapes, are an important feature of Mediterranean/Near East agriculture. They provide food for local consumption and in many cases are exported and constitute a major element of the economy. The productivity of fruit crops in these areas is falling behind that in developed countries. This is mainly attributed to the lack of sanitation programmes to prevent the spread of virus and virus-like diseases. While the area harbours a very limited group of such diseases, others of a devastating nature, e.g. citrus greening, citrus canker, tristeza, plum pox (Sharka), etc. have not yet been introduced into these areas or have been introduced but are not established. The sanitary situation of fruit crops in the area is outlined and the need for fruit crop sanitation is discussed. The methodologies for production, maintenance and distribution of healthy planting material are also described.



7

THE PROBLEM OF FUNGICIDE RESISTANCE OF PLANT PATHOGENIC FUNGI. E.Schlösser, Institut für Phytopathologie und Angewandte Zoologie Justus Liebig-Universität, Giessen, Federal Republic of Germany.

Development of fungicide resistance of plant pathogenic fungi is a world-wide phenomenon. Based on selected examples, the factors responsible for resistance development will be presented. Means of overcoming already existing resistance problems will be discussed as well as strategies to prevent or retard a build-up of fungicide resistant fungal populations.

8

ENTOMOLOGY RESEARCH IN THE ARAB COUNTRIES: PAST, PRESENT AND FUTURE. G.Hariri, ISNAR, POB 93375, 2509 AJ, The Hague, Netherlands.

Numerous studies were made in the area of entomology over the last 100 years. It is becoming very difficult for a specialist in any of the many branches of entomology to keep up with all the new developments. The history of advancement in entomology paralleled that of biological sciences in general, and those of agricultural and medical sciences in particular. In the last century, insects life history studies (discovery period) constituted the backbone of that science. Late in the last century and in the twentieth century until today, more and more new areas of study are established. Advances in the different branches of entomology - especially applied studies - lead to the development of new technologies which played an important role in reducing losses due to injurious pests and increased the use of beneficial insects (applied period). However, the unwise use of new technologies lead to the development of problems which did not exist earlier. Furthermore, advances in different sciences lead entomologists to make use of the systems approach (systems approach period). In this context, the past, present and future of entomology in the arab countries will be discussed.

RECENT APPROACHES FOR CONTROL OF PARASITIC WEEDS. C.L.Foy and R.Jain, Department of Plant Pathology, Physiology and Weed Science, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061, United States of America.

9

Broomrape (Orobanche spp.) and witchweed (Striga spp.) are devastating root parasites of many agricultural crops and cause severe yield losses. Conventional weed control methods, such as cultivation and the use of selective chemicals, are largely ineffective due to the close ecological and physiological relationship between host and parasite. A search for genetic resistance to broomrape O.aegyptiaca in tomato has not been very encouraging. Although herbicides such as 2,4-D have been used against witchweed, the only effective (but expensive) means of broomrape control has been soil sterilization, by either chemical fumigation or solarization. Two recent approaches show considerable promise for controlling these parasitic weeds. Ethylene has proved very effective in stimulating suicidal germination of witchweed seeds but has been far less effective on broomrape seeds. Strigol and its synthetic analogues, however, have been observed to enhance germination of broomrape seeds in the absence of host plant exudates. Glyphosate herbicide selectively controls/suppresses broomrape in crops such as broadbean. <sup>14</sup>C-gluphosate is translocated from host leaves to broomrape shoots where it accunulates in concentrations greater than in any part of the host plant, including the apical meristem. An integrated approach using the seed germination stimulants and translocated herbicides such as 2,4-D in the case of witchweed and glyphosate in the cause of broomrape may prove most useful in controlling these parasitic weeds. Adequate water and nutrient supply to host plants may also reduce parasitization by broomrape and thus prevent yield loss.

PLANT QUARANTINES AS AN IMPORTANT MEANS FOR PREVENTING THE SPREAD OF NEW PESTS. J.A.Franklin, Region 2, Aphis, USDA, PPQ, The Hague, The Netherlands.

10

The rapid movement of plants and plant products between countries and around the world is stressing the capability of many national plant quarantine agencies. These agencies are finding it increasingly difficult to carry out traditional methods for preventing the entry of new plant pests. Increasing volumes of plant material for propagational Salzanges in shipping methods, such as the use of ship containers, are further complicating plant quarantine efforts. As a result, the United States Department of Agriculture (Animal and Plant Health Inspection Service - Plant Protection and Quarantine) has been re-thinking its approaches to preventing the introduction of new plant pests into the United States. This paper summarizes some of these thoughts.

SEED-BORNE FUNGI OF LENTILS IN LEBANON. A.T.Saad, W.Khuri, M.Damaj and A.Khatib. Faculty of Agricultural and Food Sciences, American University of Beirut, Lebanon.

An investigation was carried out to detect the occurrence of seed-borne fungi in lentil samples collected from nine different localities in Lebanon. Representative subsamples were examined by the blotter and agar plate methods according to the rules of the International Seed Testing Association. The isolated fungi were tested for their pathogenicity using greenhouse grown lentils in pots and a test-tube sterile seedlings technique. Results revealed that the lentil seeds were infested with important seed-borne pathogens such as Ascochyta spp., Botrytis spp., Fusarium spp. and Phoma sp. which proved to be pathogenic to lentil seedlings. However, several other common seed contaminants such as Alternaria spp., Aspergillus spp., Chaetomium spp., Cladosporium spp., Penicillium spp. and Rhizopus spp. were also recorded. Among the detected pathogenic fungi, Phoma sp. is noted to be a new record of seed-borne organisms on lentils.

THE PROTECTIVE AND CURATIVE EFFECTS OF CERTAIN SYSTEMIC FUNGICIDES AGAINST ALFALFA RUST. H.A.Eisa<sup>1</sup>, B.A.Youssef<sup>1</sup>, M.S.Khalil<sup>1</sup>, A.M.Amr<sup>1</sup>, N.A.Mohamed<sup>2</sup> and A.M.Rammah<sup>2</sup> (1) Plant Pathology Research Institute, Agricultural Research Center, Giza and (2) Field Crops Research Institute, Agricultural Research Center, Giza, Egypt.

In greenhouse experiments five systemic fungicides were used singly as a foliar application to reduce or eliminate the infection of alfalfa rust caused by Uromyces striatus. The fungicides used in this experiment were Sapro, Plantvax 20, Baycor, Bayleton and Benlate. Their antifungal activity as a protective and curative treatments at different intervals were determined. Plantvax at the rate of 350 cm<sup>3</sup>/100 liter water showed much better activity as a curative and protective fungicide than the others tested. The fungicides Sapro, Plantvax and Bayleton have proved to have more protective effects than the other tested fungicides. Besides, Bayleton<sup>c</sup> (at the rate of 200 grams/100 liter water) showed a distinctly prolonged protection from rust than the other fungicides tested. Benlate was ineffective as protective or curative on alfalfa rust.

AFLATOXIN CONTAMINATION OF GROUNDNUTS. A.M. Abdel-Rahim<sup>1</sup>, N.H. Hag-ElAmin<sup>1</sup> and A.El-Subki<sup>2</sup>. (1) Department of Crop Protection, Faculty of Agriculture, University of Khartoum, Sudan and (2) Food Research Center, Shambat, Sudan.

13

Groundnut samples collected immediately after harvest from different locations in the Gezira scheme, Central Sudan, were free from aflatoxins using the TBI method of extraction. However, samples collected from all locations in Kurdofan area, Western Sudan, showed variable levels of aflatoxins. El-Hamdi gave 100% contamination, followed by Um Ramad (60%), Gealbot (50%) and Casgial (10%). Both types of aflatoxins B<sub>1</sub> and B<sub>2</sub> were detected in the contaminated samples. Ashford and Barbeton, the two widely grown cultivars of groundnuts in the Sudan, were both naturally infected with Aspergillus flavus and contaminated with aflatoxins. The level of contamination was higher in pods of Barbeton. Damaged pods (insect or harvest) were found to be infected with A. flavus and had large amounts of aflatoxins, while sound intact pods were almost free from contamination.

SUSCEPTIBILITY OF SOME LEMON VARIETIES. THE MAL SECCO DISEASE IN THE LATTAKIA REGION. A.Raee, Directorate of Agriculture and Agrarian Reform, Lattakia, Syria.

14

This study was conducted at the Agricultural Stations Vedeo and Siana in the Lattakia region to determine the susceptibility/resistance of 12 lemon varieties to the disease. The varieties, planted in 1980, were exposed to the same agricultural practices and to natural infection by the disease and evaluation was done in 1984. The results obtained showed variation in the susceptibility of the varieties to the disease, except Meyer lemon which showed 0% infection. Next in resistance was the variety Monachello. Results of grafting Santa Terasa on 8 different root-stocks showed no effect of the root-stocks used on the susceptibility/resistance of the variety to the mal secco disease.

EFFECT OF NITRIFICATION INHIBITOR (N-SERVE) AND NITROGEN FERTILIZER (UREA) ON COTTON CROP, WITH REFERRING TO SOME OF ITS DISEASES. A.K.Rowaished and S.S.Shahbal Faculty of Agriculture, Aden University, Democratic Yemen.

Field experiments were conducted to study the effect of nitrification inhibitor (N-serve) with and without N-fertilizer (Urea) on cotton crop production. Some morphological and physiological parameters were studied, and some cotton diseases were also evaluated under the experimental condition. The results indicate that nitrification inhibitor with urea was more effective in yield component by increasing significantly the plant length, number of fruiting branches, number and weight of the bolls and the production. The number of wilted plants and reddening of leaves tended to decrease especially with treatment of nitrogen and N-serve.

SURVEY OF FUNGAL DISEASES OF WHEAT IN JORDAN. H.Abu-Blan. Department of Plant Protection, Faculty of Agriculture, University of Jordan, Amman, Jordan.

A quantitative survey on the distribution and identification of fungal wheat diseases was conducted during the cropping seasons of 1983/1984 and 1984/1985. The survey covered 50 randomly fields in the northern, central and southern main wheat growing areas of Jordan. Incidence and severity of the identified diseases were also recorded in the inspected fields. Ten widespread fungal diseases have been found on wheat in the surveyed areas. These diseases are listed according to their importance: brown (leaf) rust, black stem rust, yellow (stripe) rust, powdery mildew, septoria leaf spot, spot blotch, covered smut, loose smut, flag smut and head blight. Foliar diseases were found to be more severe in the northern region than other regions. Their incidence and severity in the north was 1.5, 2 times higher than that of the central and southern regions, respectively.

SCREENING WHEAT GERMPLASM FOR RESISTANCE TO SEPTORIA TRITICI BLOTCH (MYCOSPHAERELLA GRAMINICOLA). O.F.Mamluk, J.A.G.van Leur, M.Nachit and G.O.Ferrara. The International Center for Agricultural Research in the Dry Areas (ICARDA), Aleppo, Syria.

17

The screening strategy of wheat germplasm for resistance to septoria tritici blotch has been described. The screening emphasizes on the multilocation testing with isolates from the respective locations and the repeat testing of lines showing resistance to the disease. It aims at the identification and development of germplasm pool for septoria resistance to be used as parental material in the breeding programs. Results of screening breeding material from ICARDA are presented. From the Septoria Nursery, which was initiated in 1982-83, 12 lines from each durum and bread wheat were found to be resistant in all locations tested during the 1983-84 season. However, by retesting in 1984-85, 3 lines from durum and 4 from bread wheat were resistant to the disease and thus maintained their resistance over the three years testing. Some crosses with dicoccoides species in durum are demonstrating resistance to Septoria, whereas in bread wheat crosses with cv. Kavkaz, a Russian winter wheat, are resistant to the disease.

AN ACCOUNT OF THE GENUS PYTHIUM IN THE WEST BAN AND GAZA STRIP. M.S.Ali Shtayeh, Dept. of Biological Sciences, An-Najah University, Nablus, West Bank.

18

A key to the 48 taxa of Pythium recorded so far from the West Bank and Gaza Strip is given. Thirty species were described and illustrated. Descriptions were produced from the study of several isolates in order to account for intraspecific variation. Complete descriptions are now given for Pythium papillatum Matthews and P.conidiophorum Jokl; these descriptions were neither complete nor adequate in the reported literature. The other 17 taxa were outlined briefly. These include taxa isolated only once or twice and/or failed to form sexual reproductive structures following their identification. Taxa without oogonia (P. group 'F', P. group 'G', P. group 'H.S' and P. group 'L'.) and taxa described by the author in 1982 from Britain (P.lucens, P.lutarium, P.minor, P.pachycaule, and P.parvum) were isolated from the West Bank. Occurrence of the different taxa in the West Bank and Gaza Strip as well as in other neighbouring countries were briefly outlined. All known records of rare species were mentioned. All known host records of Pythium from the West Bank and Gaza Strip were also listed.

A BIOLOGICAL STUDY ON THE SHOT HOLE DISEASE OF STONE FRUITS IN SYRIA (1983-1985).  
S.Al-Chaabi. Directorate of Agricultural Scientific Research, Damascus, Syria.

Shot hole affects leaves, flowers, nodes, fruits, buds, shoots and branches of peach and almond trees; leaves, nodes and to a lesser extent buds of apricot. In 1984, disease severity was 26% on peach and 28% on apricot. By the end of April, 50-95% of peach leaves dropped (Al-Rastan) when all the shoots were infected and 52% of the buds were dead. Almost all apricot fruits were infected with 44% severity (El-Hiffe, 1984). Except for peach, bud gummosis was not evident. Bud symptoms appeared as black spots at the basis of buds and scales. The pathogen C.carpophilum developed conidia 29-39 x 11-12.7 $\mu$ , mostly 4-5 celled. The fungus overwintered as mycelium, conidia or chlamydospores on cankers, spots and external scales of buds and on almond fruits. Sucrose, glucose and fructose were the most suitable carbohydrates for fungus development, and the oat-glucose media gave the best results. The fungus was able to survive for a long period. Infection started with peach flower-bud opening to reach its peak by the end of April (Al-Rastan) or by June on apricot (El-Hiffe). The fungus had several cycles per year, where new infections occurred during the growing season.

THE RELATIONSHIP BETWEEN DASYNEURA OLEAE L. AND PSEUDOMONAS SAVASTANOI SR. ON OLIVE TREES. N.Y.Katlabi, M.Kh.El-Mouallem and E.Koudmani. Directorate of Agricultural Scientific Research, Damascus, Syria.

Through the study on Dasyneura oleae on olive trees we have noticed contamination with the bacterium P.savastanoi inside the larval tunnel. The infestations were in a high ratio inside the tunnels on shoots (about 100%) and less on the flowers peduncles (about 87% and the least infestations occurred on the leaves tunnels. The contamination happened accidentally from the wounds caused by the larvae, and is not transmitted by the adults or plant tissues. The incubation period takes about two months and after swelling of the tissue the larvae is killed. The distribution of the bacterium correlates with the activity of D.oleae as it happened at Jennata (1977 and 1978) and Tartous (1980 and 1981).

WILT OF LENTIL IN SOUTHERN SYRIA. M.Al-Ahmed and M.N.Mosselli, Directorate of Agricultural Scientific Research, Damascus, Syria.

21

Lentil crop in southern Syria is affected by the wilt disease which is considered the major disease problem. Disease survey conducted during 1984/85 indicated that the overall percentage of infection in the region was 13.24. Disease symptoms appeared as yellowing, defoliation of leaves and total drying and can be placed in two categories: vascular wilt and nonvascular yellowing. Laboratory isolation revealed that Fusarium oxyporum, Fusarium solani and Sclerotinia sclerotiorum are associated with the wilt problem. The percentage of isolates obtained was 60, 37.52 and 2.48 for F.oxyporum, F.solani and S.sclerotiorum, respectively. Pathogenicity test of F.oxyporum and F.solani showed that the former pathogen induces vascular wilt and non vascular yellowing, while the latter induces root rot. The performance of the two local cultivars (Haurani and Kurdi) against wilt is quite different, where Haurani shows higher susceptibility.

NOUVELLE PARTICIPATION A L'ETUDE DES MALADIES FONGIQUES DE LA FLORE SYRIENNE. M.F.Azmeh and M.T.Kossagi. Faculté d'Agronomie, Université de Damas, Damas, Syrie.

22

L'objet de cette étude est l'établissement de l'inventaire des champignons parasites des plantes syriennes non-cultivées, notamment celles ayant un intérêt économique ou écologique. Cette deuxième liste contient une trentaine d'espèces nouvelles qui s'ajoutent à notre liste précédente, ce qui porte le total à une centaine. Parmi les cas enregistrés nous signalons: des rouilles à (Puccinia) sur Asphodelus, Echinops, Falcaria, Ferula, Lolium, Senecio, Vinca et Xanthium, des rouilles à (Uromyces) sur Leontis, des rouilles blanches (Albugo) sur Gymarrhea, Lepidium, et Sinapsis, et des oïdiums à (Leveillula) sur Epilobium, Gallium et Cirsium.



SOME MORPHOLOGICAL AND BIOLOGICAL ASPECTS OF THE CAUSAL AGENTS OF COMMON BUNT (TILLETIA FOETIDA AND T.CARIES) AND SCREENING FOR RESISTANCE TO THE DISEASE.

O.F.Mamluk, A.M.Makki and J.A.G. van Leur. The International Center for Agricultural Research in the Dry Areas, (ICARDA), Aleppo, Syria.

Investigation to determine the actual yield loss due to the common bunt disease was carried on 144 bunted heads from 8 countries of the ICARDA region. The factor 0.93 has been calculated for loss assessment in the field. For the distinction between the two pathogens teliospores shape, size and wall structure were studied. Considering the wall structure as main distinction characteristic, 94% of spores from bread wheat were smooth-walled; whereas spores from durum wheat were 50.7% smooth-walled and 47.8% reticulated. Host preference, bread wheat vs. durum wheat, has been observed between the two pathogens T.foetida and T.caries. Results of the screening for resistance to bunt at the Center are presented with emphasis on the development of germplasm pool with sources of resistance to the disease. Twenty one lines of durum and bread wheat were resistant (<5% infected heads) to a mixture of bunt isolates from within Syria and ten lines were resistant to all 8 different isolates, exotic isolates included, in the second year of testing. From Syria originating durum wheat 'Haurani' and the once widely grown cv. 'Senatore Cappelli' are expressing excellent resistance to the disease and are used in crosses to develop bunt resistant germplasm.

SURVEY OF WILT DAMAGE ON LENTILS IN N.SYRIA. B.Baya'a<sup>1</sup>, W.Erskine<sup>2</sup> and L.Khoury<sup>2</sup>  
(1) Faculty of Agriculture, University of Aleppo and (2) The International Center for Agricultural Research in the Dry Areas (ICARDA), Aleppo, Syria.

A total of 27 lentil fields in north west Syria were surveyed for wilt damage. The proportion of wilted plants in a field varied from 2 to 70% with a mean of 11.5% plants. Isolation of fungi from diseased samples showed the predominance of Fusarium sp. A pathogenicity test showed vascular wilt symptoms and the growth of Fusarium oxysporum f. sp. lentis.

CONTRIBUTION A LA DETECTION DES SOUCHES TOXIQUES DE MOISSURES DES ALIMENTS.  
S.Maghribi. Faculté d'Agronomie, Université de Tichrine, Lattaquié, Syrie.

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360 souches de moisissures ont été isolées d'aliments destinés à l'homme et aux animaux. Ces souches sélectionnées appartiennent à 23 genres, les plus souvent représentés étant les genres Fusarium et Penicillium. Après culture sur milieu 8L2, à 22-25 C pendant 8 jours, elles ont été soumises à des tests biologiques de toxicité (tests L.s., E.g.Z.) dont les résultats sont les suivants: 21.1% des souches testées sont toxiques, 41.1% moyennement toxiques et 36.5% étant peu ou pas toxiques.

STUDIES ON SOFT ROT DISEASE INCITED BY ERWINIA CAROTOVORA AND E.ATROSEPTICA.  
K.K.Al-Hassan, N.Kasail and G.Y.Abbas. State Board for Applied Agricultural Research, Abu-Ghraib, Iraq.

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During the years 1980 and 1981 some studies en soft rot of potato were conducted. Purpose was to determine the disease spread in the field and in cold stores, to test the susceptibility of some potato cultivars to it, and to test the effectiveness of Cryptonol and Agrimycin 500 to it. Results have shown that the disease existed in the field in lower percentage but in higher percentage in the cold stores of potato. Results also revealed that all potato cultivars tested were susceptible to the disease but in different levels. Clauster and Bentj for example were very susceptible while Cardinal and Rozalin were less. Results also indicated that Cryptonol and Agrimycin were effective against the disease when used at concentration of 0.2%.

RESISTANCE IN FABA BEAN TO ASCOCHYTA BLIGHT CAUSED BY ASCOCHYTA FABAE. S.B.Hanounik and N.F.Maliha. ICARDA, POB 5466, Aleppo/Syria.

Twelve Ascochyta-blight-resistant faba bean accessions, identified locally at the International Center for Agricultural Research in the Dry Areas, were tested for two consecutive seasons, to determine their resistance spectra to blight in Syria, England, Seden and Canada. The 12 accessions BPL 230, 365, 435, 460, 471, 472, 646, 818, 266, 2485, 74 and Sel 82-Lat-A<sub>2</sub>, which were rated resistant to their respective local cultivars. At present, these accessions are being used to incorporate genes for blight resistance into well adapted local cultivars in this region.

CONTROL OF ROOT AND STEM ROT ON PEPPER CAUSED BY RHIZOCTONIA SOLANI AND PHYTOPHTHORA CAPSICI BY USING SUITABLE PLANT SPACING. A.H.El-Bahadli<sup>1</sup>, A.A.Al-Kibici<sup>2</sup> and .S.Al-Beldawi<sup>3</sup>. (1) Plant Protection Dept., College of Agriculture, Baghdad University, Baghdad, (2) Biol. Dept., College of Sciences, Salahaddin Univ. and (3) State Board of Applied Agriculturral Research, Abu-Ghraib, Iraq.

This study was conducted to find out the possibility of controlling Phytophthora capsici Leonian and Rhizoctonia solani Kuhn, inciting alone or together the root and stem rot of pepper, through determining the suitable spacing. Results of this work showed that there was considerable reduction in the rate of disease increased (r) with increase in plant spacing. When the plant spacing was 50 cm, the (r) value ranged between 0.0064 - 0.0208, while at 10 and 15 cm the (r) values were between 0.0648 - 0.1633 and 0.0237 - 0.0313 respectively. Highest number of fruitful pepper plants was obtained at 25 cm of plant spacing where (r) value ranged between 0.0151 - 0.0266. Ultimately, the percentage of infection recorded were 93.4, 85.4, 69.3 and 58.6 at 10, 15, 25 and 50 cm of plant spacing respectively.

QUANTITATIVE SURVEY OF VERTICILLIUM WILT OF OLIVE IN SOUTHERN SYRIA. M.Al-Ahmed and M.N.Mosselli. Directorate of Agricultural Scientific Research, Douma, Syria.

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Verticillium wilt of olive trees is considered the main problem of olive in southern Syria. The disease prevails everywhere but is more severe in irrigated areas especially those previously planted or intercropped to vegetables such as eggplants and tomato. Newly established orchards are more affected, and the highest record of infection was obtained from orchard 5-10 years old. The minimum percentage of infection was 0.85% in Damascus, while the maximum was 5.32% in Sweida. Field inspection and laboratory isolation revealed that Verticillium dahliae was the causal agent. The percentage of positive isolation in Damascus, Deraa and Sweida provinces was 46.30%, 35.60% and 32.25%, respectively. Other fungi are also associated with the wilt disease of olives.

EFFECT OF VAM FUNGI ON HOST METABOLISM OF BEAN AND SUDANGRASS. A.M.AL-Momany. Institute fur Pflanzenkrankheiten und Pflanzenschutz der Universitate Hannover, Hannover, Germany.

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The effect of vesicular arbuscular mycorrhizal (VAM) fungi (Glomus etunicatum) isolated from different places on plant growth has been investigated. All isolates of VAM fungi were able to increase plant growth. Formation of VAM caused changes in the content of assimilates and secondary plant products. Under the influence of VAM the water soluble content of carbohydrates was lower in roots and shoots. The content of protein and amino acids was higher in roots of mycorrhizal than of non-mycorrhizal plants, but decreased in shoots. Mycorrhizal roots of Sudan-grass showed a higher phenol content. The highest improvement of plant growth and phosphate content could be found after inoculation with VAM and fertilization with water insoluble phosphate. There was a positive correlation between P-concentration in the plant and the degree of colonisation by VAM fungi.

THE IDENTIFICATION OF POWDER MILDEWS OF CUCURBITS IN LIBYA. S.S.El-Ammari and M.Wajd Khan. Department of Plant Protection, Faculty of Agriculture, Al-Fateh University, Tripoli, Libya.

The study attempted to establish the identity of causal organism(s) of powdery mildew of indoor and outdoor cucurbits in Libya. A survey conducted both in coastal belt and desert regions of the country revealed the powdery mildews: Sphaerotheca fuliginea, Erysiphe cichoracearum and Leveillula taurica on cucurbits. Laboratory studies confirmed their existence on cucurbits in the country. S.fulginea was wide-spread and most frequent and predominant on indoor and outdoor cucurbits throughout the country. It was also observed in perithecial stage on squash at some places. E.cichoracearum and L.taurica were found in conidial stage on indoor cucumbers only at few locations.

SURVEY OF THE SEED-BORNE FUNGI OF WHEAT, BARLEY AND MAIZE IN THE DAMASCUS AND HOMS PROVINCES OF SYRIA. A.Azaza and G.M.Youssef. Directorate of Agricultural Scientific Research, Damascus, Syria.

Survey of the pathogenic seed-borne fungi of wheat, barley and maize in 1980 and 1981, revealed many species of fungi from the following genera: Alternaria, Aspergillus, Cephalosporium, Cladosporium, Drechslera and Fusarium on all the above crops; Tilletia on wheat; Ustilago on wheat and barley; Nigrospora on wheat and maize; Marcrophoma, Penicillium and Rhizopus on maize. There are also many species of saprophytic seed-borne fungi belonging to the genera as follows: 7 on wheat, 10 on barley and 3 on maize.

EVALUATION OF WHEAT GERMPLASM FOR ITS PERFORMANCE TOWARDS DIFFERENT ISOLATES OF THE YELLOW RUST PATHOGEN (PUCCINIA STRIIFORMIS WEST). IN SEEDLING AND ADULT PLANT STAGE. M.El.Naimi<sup>1</sup> and R.W.Stubbs<sup>2</sup>, (1) The International Center for Agricultural Research in the Dry Areas (ICARDA, Aleppo, Syria and (2) The Research Institute for Plant Protection (IPO), Wageningen, The Netherlands.

Lines of durum and bread wheat, previously identified as promising in multi-location field screening, have been evaluated at IPO for their resistance to yellow rust cultures with known virulence in seedling and adult stage. Out of the 69 bread wheat lines tested, 6 were highly resistant to all 14 cultures used in the seedling test, whereas 10 were resistant to all 8 cultures used for the adult stage testing. Two lines were resistant in both seedling and adult stage testing. Some of the Veery, Kavkaz and Bobwhite crosses are expressing good resistance to the majority of the pathogen cultures used. Out of the 84 durum lines tested, 35 were highly resistant to all 10 cultures used in the seedling test. The majority of these (22 lines) originates from the Durum Yellow Rust Nursery (DYP-85).

SURVEY OF ALFALFA DISEASES IN THE GHOUTA OF DAMASCUS (1981, 1982 and 1985). M.Ballar. The International Center for Agricultural Research in the Dry Areas (ICARDA), Aleppo, Syria.

During November 1982, August 1982 and April 1985, field and laboratory studies were conducted to identify and evaluate diseases of alfalfa (Medicago sativa L.) from 42 (1981) and 46 locations (1982, 1985) in 35 villages of the Ghouta of Damas. Identification was based on the usual laboratory methods. Disease incidence and severity were rated on 1-4 scoring scale. Results indicated the presence of the following diseases: rust (Uromyces striatus) downy mildew (Peronospora trifoliorum), summer black stem and leaf spot (Cercospora medicaginis) stemphylium leaf spot (Pleospora herbarum), powdery mildew (Leveillula taurica), spring black stem and leaf spot (Phoma medicaginis var. medicaginis), leptosphaerulina leaf spot (L.briosiana), ascochyta leaf spot (A.imperfecta), common leaf spot (Pseudopeziza medicaginis), anthracnose (Collectotricum spp.), crown and root rot (Fusarium spp.; Rhizoctonia solani), and bacterial leaf spot disease (Xanthomonas alfalfae). Based on symptoms, alfalfa mosaic virus (AMV) alfalfa enation virus (AEV), boron and iron deficiencies were also detected. Considering the frequency of occurrence of these diseases, rust, spring and summer black stem, ascochyta leaf spot, AMV and AEV were the most prevailing diseases in most locations. These diseases should be considered in future screening work for the improvement of disease resistance level by the development of new cultivars.

DECLINE OF STONE FRUIT TREES CAUSED BY PHYTOPHTHORA DRECHSLERI. M.I.Hussein and E.M.Ghalib. Plant Protection Dept., Coll. of Agriculture, Baghdad Univ., Abu-Ghraib, Republic of Iraq.

Phytophthora drechsleri Tuck. was isolated and identified for the first time from apricot, peach and plum trees (Prunus spp.) in Iraq. This fungus appeared to be the main causal agent of stone fruit trees decline. The susceptibility of four root stock, apricot (seed propagated), peach (Maysor) and plum (Marianna and Mayroblen) were compared. The result indicated that all tested root stock were susceptible to various degree. Nevertheless, Mayroblen plum root stock exhibited some degree of resistance. The relationship between Soil Water Potential (SWP) and Disease Severity (DS) were also studied. Preliminary results suggested that high SWP significantly increase DS.

CHEMICAL CONTROL OF VERTICILLIUM DAHLIAE THE MAIN CAUSE OF COTTON WILT DISEASE IN SYRIA. M.Hamidi, Directorate of Agricultural Scientific Research, Damascus, Syria.

Out of the 14 fungicides tested, the following have proved to be high effective in the control and prevention of the hyphal growth of V.Dahliae (in vitro) at the rate of 75 ppm.: Benomyl, Vitaflo, Rovral, Super davloxan, Fromidor, Thiophanate methyl and mancozeb. In the greenhouses, Benomyl, through seed dressing at the rate of 2g/kg, and their sowing within contaminated soil, proved 80% effective. As for soil treatment in addition to seed dressing after sowing at the rate of 6 kg/ha, the following systematic Fungicides proved to be effective in disease control: Vitaflo, Benomyl, Thiophanate methyl. In field trials, all the Fungicides failed to control the disease when seed dressing only was applied, whereas soil treatment after planting in addition to seed dressing was effective with all the fungicides used.

FUSARIUM WILT OF MUSKMELON IN SYRIA. Kh.Abdul-Halim, M.Safieh. Directorate of Agricultural Scientific Research, Damascus, Syria.

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The Fusarium wilt of muskmelon broke out after introducing new sweet hybrid varieties and became recently the main problem of this crop. Thereafter the muskmelon cultivation has been threatened and constricted. Our survey over the cultivation areas in Syria showed that the disease is widely spread; the percentage of infection in irrigated and rainfed areas was 72% and 50% respectively. Field inspection and sample analysis showed an interaction of wilt and root rot disease. Percentage of isolates of F.oxyporum F.melonis was 68%, while other Fusarium spp. (F.solani 18%, F.avenaceum 8%, F.moniliforme 6%) were 32%. Studying the race composition revealed that race 0.1 were prevalent and they represent 80 and 20% respectively.

INCIDENCE OF STUBBORN DISEASE OF CITRUS, ITS NATURAL TRANSMISSION IN SYRIA AND MEANS TO LIMIT ITS SPREAD. A.Rae<sup>1</sup> and J.Bove<sup>2</sup>. (1) Ministry of Agriculture, Lattakia Fdeyo Agriculture Station, (2) Bordeaux University, France.

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A survey was conducted to evaluate the incidence of citrus stubborn especially on susceptible cultivars (Washington navel, Valencia, and grape fruit) in the Lattakia region. Results indicated the high incidence of stubborn in citrus orchards, with some variation among locations and age of trees. When Vinca rosae - as an indicator plant for the stubborn agent Spiroplasma citri - was planted in many locations and observed for 3 years, it was concluded that natural spread of S.citri is occurring. It has been found that transmission was through the leaf-hopper vector N.haematoceps. Results will also be presented on how to limit the spread of citrus stubborn by producing stubborn - free citrus seedlings.



IDENTIFICATION AND PARTIAL CHARACTERIZATION OF A CLOSTEROVIRUS INFECTING MANDINA DOMESTICA. N.A.Ahmed, S.R.Christie and F.W.Zettler. Plant Pathology Department, University of Florida, Gainesville 32611.

Plants of Nandina domestica 'Nana-purpurea' have special horticultural characteristics suggestive of viral etiology. Leaf extracts of 'Nana-purpurea' plants negatively stained with 2% potassium phosphotungstate pH 7.2, revealed flexuous rod-shaped particles with a mean length of 776 nm. Ultrastructure of virus particles stained with 2% uranyl formate revealed a helix pitch of 3.9 nm. Sectioned phloem tissue stained in Azure-A revealed amorphous inclusion bodies similar to those reported for closteroviruses. Tissue stained in calcomine orange and Luxol brilliant green revealed no cytoplasmic inclusions indicative of potyviruses. The virus was transmitted by grafting and by slash-inoculation to common nandina seedlings, inducing foliar mosaic, distortion and stem-pitting symptoms. The virus was purified using a cesium sulfate gradient. The A260/280 ratio was 1.26. This virus appears to be a previously undescribed closterovirus and is tentatively designated as nandina stem pitting virus.

OCCURENCE AND SEROLOGICAL RELATEDNESS OF FIVE CUCURBIT VIRUSES IN LEBANON AND SYRIA. L.Katul and K.M.Makkouk. Faculty of Agricultural and Food Sciences, American University of Beirut and National Council for Scientific Research, Beirut, Lebanon. Present address of second author: ICARDA, P.O.Box 5466, Aleppo, Syria.

A field survey conducted during spring 1985 on cucurbits in Lebanon and North Syria, revealed the presence of Zucchini yellow fleck (ZYFV), Zucchini yellow mosaic (ZYMV), watermelon mosaic 1 (WMV-1), watermelon mosaic 2 (WMV-2) and cucumber mosaic (CMV) viruses at 47.0, 24.4, 43.7, 38.5 and 48.0% of the tested samples, respectively. Bean yellow mosaic virus (BYMV) was not detected. Leaf samples were extracted in 0.1 M phosphate + 0.1 M EDTA buffer, pH 7.4 and tested by the double antibody sandwich enzyme-linked immunosorbent assay (DAS-ELISA). The same procedure was used to study the serological relatedness among the viruses. WMV-1 antigen strongly reacted with WMV-2 and ZYMV antisera, and ZYFV antigen showed some reactivity against ZYMV antiserum. Intact leaf disks (2-12 disks/well) were as efficient as macerated leaf disks for the detection of WMV-1, WMV-2 and ZYFV by ELISA. Using a rapid and simplified assay, where leaf sap is incubated simultaneously with the enzyme-conjugate, detectability of ZYMV and BYMV was increased around two fold. A one day ELISA procedure was successful in detecting BYMV. Replacing the polystyrene plates in DAS-ELISA by nitrocellulose membranes (Dot-ELISA) provided greater sensitivity for the detection of WMV-2.

A SURVEY OF VIRUSES AFFECTING DRY BEAN AND COWPEA IN LEBANON. O.I.Azzam & K.M. Makkouk. Faculty of Agricultural and Food Sciences, American University of Beirut and National Council for Scientific Research, Beirut, Lebanon. Present address of authors: ICARDA, P.O.Box 5466, Aleppo, Syria.

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A survey was conducted to identify viruses affecting dry bean (Phaseolus vulgaris) and cowpea (Vigna unguiculata) in Lebanon. Three hundred and thirty four samples exhibiting virus-like symptoms were collected from 13 different locations during the fall growing season of 1984. Samples were stored at -20°C until they were tested by the enzyme-linked immunosorbent assay (ELISA) for the presence of blackeye cowpea mosaic virus (BICMV), bean yellow mosaic virus (BYMV), bean common mosaic virus (BCMV) and cucumber mosaic virus (CMV). In preliminary tests, the extraction buffer 0.1M phosphate + 0.1M EDTA, pH 7.4, was found to be far better than the standard extraction buffer and, accordingly, was used for virus extraction for all field samples. Results obtained indicated that around 50% of the bean samples tested were infected with BICMV. Incidence of BCMV, BYMV and CMV in the samples tested was 4,4 and 1.7% respectively. BICMV was detected in 10 locations, whereas, BYMV, BCMV and CMV were found in 1,4 and 4 locations, respectively. Mixed infections such as BCMV + BICMV, BCMV+CMV, BYMV+CMV and BICMV+BCMV+CMV were detected. In 35% of the samples assayed, the casual virus was not identified.

CONTRIBUTION TO THE TRANSMISSION AND IDENTIFICATION OF BEAN YELLOW MOSAIC VIRUS (BYMV). G.M.Saleh and R.A.Ah-Ani.

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Greenhouse pot experiments were conducted to identify some species of aphids able to transmit Bean Yellow Mosaic Virus and some weeds susceptible to the viral infection. Results obtained indicated that two additional species of aphids Rhopalosiphum padi and Aphis neri can transmit the virus in a non-persistent manner. It was shown that a new species of chenopodium (Chenopodium murale) responded to the viral infection by producing local chlorotic lesions on the inoculated leaves. These findings about this virus seem to be reported for the first time.

TRADUCTION DU RNA DE POTYVIRUS Y (PVY) DE LA POMME DE TERRE, DANS LE SYSTEME DE LECTURE RNA DEPENDANT PROVENANT DE LYSAT DE RETICULOCYTES DE LAPIN. IDENTIFICATION DE LA PROTEINE COPIDIARE PARMIS LES PRODUITS DE TRADUCTION. A.Khaddam<sup>1</sup> P.Cornet<sup>2</sup> et S.Astier<sup>2</sup>. (1) Dept. de la protection de plantes, Faculte d'Agronomie, Tichrine Universite de Lattaquie, Syrie and (2) Institut National de recherche agronomique I.N.R.A. Station de Pathologie Vegetale, Versailles, France.

Le RNA de PVY est traduit dans le systeme lysat de reticulocytes avec efficacite. Le RNA viral (39s) prepare par dissociation en milieu alcalin sur gradient de Saccharose stimule l'incorporation de ( $S^{35}$ ) methionine 10-15 fois plus que le temoin. Les produits marques de traduction sont analyses sur un gel d'acrylamide (PAGE), la proteine 33kd est identifiee comme la proteine copidiare, par l'estimation de son poids moleculaire et par des relations serologiques.

INDEXING OF SELECTED PROSPECTIVE MOTHER TREES FOR VIRUS AND VIRUS-LIKE DISEASES IN SYRIA. N.A.Ahmed<sup>1</sup>, A.L.Martinez<sup>2</sup> and A.AbdulAziz<sup>3</sup>. (1 and 3) The citrus office, Tartous, Syria and (2) F.A.O citrus disease expert in Syria.

In the search for disease free local sources of citrus propagative material, indexing of selected prospective mother trees of different cultivars was carried out by tissue graft inoculation in an insect-proof greenhouse. Two indicator buddlings were used for each virus disease in study. All budding knives were disinfected by a solution of 1% sodium hypochlorite. Of the 112 trees passed the short term indexing, 66% indexed positive for exocortis and psorosis diseases. The indicator plants used in long term indexing (primarily for xyloporosis, cristicortis and impietratura virus diseases) are still kept for observation in the greenhouse. Indexing for the stubborn disease is carried out by ELISA and culture of Spiroplasma citri.

VIRUSES AFFECTING STONEFRUITS IN LEBANON. H.Takiyeddine. Faculty of Agricultural and Food Sciences, American University of Beirut and National Council for Scientific Research, Beirut, Lebanon.

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A survey was conducted during 1984 and 1985 to identify viruses affecting stonefruits in Lebanon. Samples were collected from orchards and commercial nurseries in the Bequaa, central and north Lebanon. Twig tissue and seeds were collected at random, regardless the health status of trees and were tested for the presence of plum pox virus (PPV), prune dwarf virus (PDV) and prunus necrotic ringspot virus (PNRSV) by the enzyme-linked immunosorbent assay (ELISA). Highest rate of seed infection was found with PDV, where 75% in the North (Dinniye) and 72% in the Bequaa of almond seeds were found infected. In apricot seeds, 25% were PDV-infected in the Bequaa, 36.5% in the Chouf area, and no infection in the North. Bitter almond seeds, and plum seeds were not infected with PDV. However, 20% of the bitter almond seeds tested were infected with PNRSV, whereas sweet almond seed infection ranged from 0% in the North to 62% in the Bequaa. In the nurseries, PDV infection ranged from 0 to 9%. PNRSV was detected in seedlings from all nurseries surveyed and infection varied from 3 to 12%. PPV was not detected in the one nursery tested. In orchards, PNRSV was more encountered than PDV and highest PNRSV incidence in plums found was 13%. In peaches PNRSV infection ranged between 0 and 15%.

FROND MALFORMATION DISEASE OF DATE PALMS (PHOENIX DACTYLIFERA L.) IN LIBYA. J.A. Khalil, E.A.Edongali, and S.M.Nuesry. Faculty of Agriculture, University of Al-Fateh, Tripoli, Libya.

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A number of date palm trees in the districts of Al-Jofra and Ain-Zara in the Southern and coastal parts of Libya respectively, showed abnormal frond malformation. These malformations consisted of the midribs of the leaves being wavy and the leaflets and the spines having a zigzag appearance. It was noticed in some cases that the leaflets were profusely stacked on both sides of the wavy fronds and the spines were twisted. Other fronds carried normal leaflets on one side of the midrib and wavy leaflets on the other side, whereas others developed spiny leaflets. Mechanical inoculation with the sap from diseased trees to date palm seedlings and to other herbaceous plant species was not successful. The causal agent has not been identified.

INCIDENCE SYMPTOMATOLOGY AND TRANSMISSION OF OKRA MOSAIC VIRUS IN SUDAN. A.G.M. Abdul-Magid. Dept. of Agric. Botany, Faculty of Agriculture, Khartoum North, Sudan

Okra mosaic virus (OMV) was isolated from okra plants (*Hibiscus esculantus* L.) with mosaic leaf symptoms growing in the Sudan. The virus was transmitted by sap inoculation to 12 plant species and cultivars including some important crops and by the chrysomelid beetle *Podagrica puncticollis* Weise, but it was not seed-borne, in 2 hosts. The virus was serologically related to OMV. It was moderately stable in vitro; sap from okra plant was infective after 10 min. at 75 but not 80°C, after dilution to 10<sup>-6</sup> but not 10<sup>-7</sup>, and after 8-9 days at 20°C.

STUDIES OF THE OCCURENCE OF PEANUT STUNT VIRUS AND ITS RELATIONSHIP TO THE YIELD LOSSES OF LEGUMES IN THE SUDAN. A.H.Ahmed and A.O.Ab.-Bagi, Faculty of Agriculture University of Khartoum, Sudan.

Peanut stunt virus disease is naturally occurring in the Sudan in several leguminous crops and weeds of which *Medicago sativa*, *Datura stramonium*, *Phaseolus trilobus*, *Clitoria ternata* and *Cortalaria saltiana* are considered important reservoirs for both the virus and its aphid vectors. Peanut stunt virus was readily transmitted by four aphid species predominantly infesting legumes in the Sudan. Field investigations have shown a close relationship between *Aphis craccivora* infestation and the disease incidence on alfalfa under natural field conditions. In field and/or glasshouse experiments the virus infection significantly reduced the growth, nodulation and yield of *Vicia faba*, *Vigna unguiculata*, *Phaseolus vulgaris* and *Medicago sativa*. Future control strategies have been suggested.

IDENTIFICATION OF BROAD BEAN STAIN VIRUS IN FABIA BEAN AND LENTIL IN LEBANON AND SYRIA AND ITS SEROLOGICAL DETECTION IN SEEDS. K.M.Makkouk<sup>1</sup>, L.Bos<sup>2</sup>, O.I.Azzam<sup>1</sup> and S.Asaad<sup>1</sup>. (1) ICARDA, P.O.Box 5466, Aleppo, Syria. (2) Institute for Plant Protection (IPO), Wageningen, The Netherlands.

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A survey was conducted to identify viruses affecting faba bean and lentil in Lebanon and Syria. 189 samples exhibiting virus-like symptoms were collected from different locations during late winter - early spring of 1985. Twenty five and 14% of the samples tested were found to be infected with broad bean stain virus (BBSV), in Syria and Lebanon, respectively. Identity of the virus was based on electron microscopy, serology (ELISA) and infectivity tests with indicator plants, whereas, field samples were assayed only by ELISA. Virus detection in seeds was also possible by ELISA by testing either ground seed extracts or germinated embryos. However, testing germinated embryos gave a slightly lower seed infection rate than ground whole seeds, which makes the former a better test for evaluating seed infection rates. When infected: healthy seed mixtures were tested, BBSV was reliably detected up to a ratio of 1:800. Virus distribution in the germinated seeds was inconsistent. In some samples, virus concentration was high in leaves and roots and low in the seed coat + cotyledons, whereas in others, virus concentration was high in the seed coat + cotyledons and very low - if any - in the germinated seedling.

RELATIVE SUSCEPTIBILITY OF MAIZE GERMPLASM TO INFESTATION WITH THE PINK BORER, SESAMIA CRETICA LED. (LEPIDOPTERA: NOCTUIDAE). 8. EVALUATION OF CERTAIN GENETIC STRUCTURES SELECTED BY THE MAIZE RESEARCH DIVISION. S.I.El-Sherif<sup>1</sup>, F.F.Mostafa and O.O.Nagouli<sup>2</sup>. (1) Faculty of Agriculture, Cairo University at Giza and Fayoum and (2) Agriculture Research Center, MOA, Egypt.

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The susceptibility of 71 families of S<sub>2</sub> maize germplasm belonging to 7 different genetic structures selected by Maize Research Division, A.R.C., Egypt, was evaluated for infestation with S.creteria under natural infestation conditions in 1985 season. Evaluation was based on infestation rate, % dead-heart, % total infested plants, and % resistance. Families from the Corn Belt structure were the least susceptible. The mean percentages of resistance were 41, 39, 34, 30, 29, 26 and 20% for Corn Belt, Am. Early, Sids 7734, Comp. 5, Ciba-Geigy 4141, Tepalcinco-5 and Gemmeiza 7421 genetic structures, respectively. None of the tested families showed high resistance, 7 families were resistant, 39 families were relatively resistant, 23 families were susceptible and 2 families were highly susceptible.

CHRYSOPA AS NATURAL ENEMY OF APHIDS ON TOMATO. F.A.Hossam-Eldin, Plant Protection Department, Faculty of Agriculture, Kafr El-Sheikh, Tanta University, Egypt.

To determine the value of Chrysopa carnea Steph. as a predator of the green peach aphids, Myzus persicae, on tomato, releases of laboratory reared Chrysopa larvae were carried out in small plastic tunnel plots. Different ratios of Chrysopa larvae to aphids were made (1:3, 1:5, 1:10, 1:20, 1:30 and 1:40). All the aphids were successfully controlled by releasing Chrysopa in the early second stage at the predator/prey ratios of 1:3, 1:5 and 1:10. Chrysopa releases at these ratios repeatedly resulted in virtually total elimination of aphid populations. While the Chrysopa-treated plants reached normal size, most of untreated control plants died during the first eight weeks of the experiments. In further experiments with higher predator/prey ratios, it was shown that only small reductions in the number of aphids could be achieved with ratios 1:20, 1:30 and 1:40.

DIFFERENT STAGES OF INSECT INFESTATION OF FALLEN DATES. H.K.Jassim and Abdel-Ahad, I., Plant Protection Research Center, Abu-Ghraib, Baghdad, Iraq.

This study was done in Zafaraneyah Farm in Baghdad. The study involved the population density and a different species of insects that infest the fallen dates of four varieties Khastawi, Sayer, Khatrawi and Zahdi, which are considered as the most important commercial varieties. These varieties showed variations in their infestation levels. The infestation percentage of fruits without perianth was higher than that of fruits with perianth, and it increased as the dates stay longer on palms. The survey revealed more than 15 species of insects infesting fallen date; the most important of them belong to the general Ephesta and Carpophilus which cause big losses of dates.

INFESTATION BY DACUS OLEA (GMELIN) (DIPTERA, TEPHRITIDAE), AND PARASITISM BY OPIUS CONCOLOR (SZEPL.) (HYMENOPTERA, BRACONIDAE) IN NORTH WEST LIBYA. Naima, M.Layas, Abdul-Majeed A.Ben-Saad. Faculty of Agriculture, Al-Fateh University, Tripoli, Libya.

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The infestation with (Dacus oleae and parasitism by Opius concolor was studied on common olive varieties during the agricultural seasons 1982 and 1983 at four different ecological locations in the north west of Jamahiriya. The infestation occurred in two periods; in the spring and summer, and autumn and winter, in the coastal locations and at the end of the season in the internal and mountain locations. The continuing presence of fruits on trees after harvesting season had an effect on the infestation in the following season. Infestation date was significantly affected by variety and location. Garazi variety was the least infested especially in the mountain location whereas Induri variety was the most infested especially in the coastal location. Larvae of D. oleae inside the fruits was subject to attack by the parasitoid Opius concolor. Parasitism varied significantly with location. The larvae of D. oleae was also parasitized by other external parasites: Eupelmus urozonus(Dalm), Pingalio lungulus (Masi) and Cecedomiidae spp.

CONTROLLING THE LARGE ELM BARK BEETLE SCOLYTUS SCOLYTUS F. BY THE BACTERIA BACILLUS SPP. AND PSEUDOMONAS SYRINGAE. H.K.Jassim. Plant Protection Research Center. Abu-Ghraib, Baghdad, Iraq.

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Larvae of large elm bark beetle Scolytus Scolytus (F.) were exposed to some Bacillus thuringiensis Strains and other Bacillus spp. Some strains of B.Thuringiensis were pathogenic to S.scolytus and resulted in high larval mortality. Moreover, the larvae were exposed to three other species of Bacillus (B.cereus, B.alivei and B.megaterium) and two strains of Pseudomonas syringae (M27m, 174); all having same concentration level, B.cereus and B.alivei gave high level mortality while B.megaterium showed no significant effect; on the other hand the two strains of P.syringae resulted in a mortality slightly higher than that of the control.



MECHANIZATION OF PEST CONTROL. N.Arkawi and I.Nussair. Damascus. Daar Al-Mouhandiseen. POB 2845.

Since the pest control plays an increasingly important role to increase the yield's crops, therefore we will search quantitative interrelation ship between pesticide application and the yield of crops. Meanwhile the economic aspects of mechanizing the pest control practices will be indicated. This paper will explain methods and techniques of pest control and its needed agricultural machinery such as sprayers, dusters. Eventually we come to the factors which may effect the efficiency of pesticide application, and the roles of its handling since it is very poisoned material.

LA LUTTE INTEGREE CONTRE LA PROCESSIONAIRE DU PIN THAUMETOPOEA PITYOCAMPA SCHIFF EN ALGERIE. M.M.Husseiny, Organisation des Nations Unies pour l'amelioration de l'Agriculture et l'institut National de la Protection des Vegetaux, Alger, Algerie.

Vue l'importance des reboisements infestés par la ProceSSIONAIRE du pin et le danger qu'il pose au Barrage Vert, des études détaillées furent réalisées afin d'élaborer un programme de lutte intégrée contre ce ravageur. Ce programme fut développé en utilisant tous les moyens de lutte possible tenant compte de l'économie des opérations et de l'équilibre naturel dans les forêts. Il comprend l'utilisation des races particulières de Bacillus thurengiensis (serotype 3 et 3b) et de DiFlubenzuron, (substance de croissance). Les opérations de traitement doivent être effectuées en périodes qui sont déterminées en coordination avec les services d'avertissement agricole. Differentes methodes de lutte furent combinées: lutte mécanique, pièges à attractifs sexuels, pulverisation à bas volume terrestre, par avion et par hélicoptère. Il est à préciser que les couts d'interventions pendant la campagne nationale de lutte contre la ProceSSIONAIRE en 1982 se sont élevés à 35,634,000 D.A. constituant moins de 9,6% des dégâts annuels causes par ce ravageur.

SOME BIOEFFECTS OF AN ANTI-ALATIN COMPOUND ON THE DESERT LOCUST SCHISTOCERCA GREGARIA (FORSK). M.A.Eid, M.A.Salem, G.Z.Taha. Faculty of Agriculture, Cairo University, Cairo, Egypt.

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This investigation aimed to evaluate precocene II compound that may derange normal development by altering food utilization, protease activity, and cuticle protein deposition. The morphogenetic effects were mainly, precociously differentiated adults, variance of adult size, mortality and abnormalities at the final moult. Ovarian development, growth rate, food utilization, proteolytic activity and cuticle development were affected by precocene II treatments.

LABORATORY EVALUATION OF CERTAIN INSECTICIDES OF TETRASTICHUS COCCINELLI KUDJ., PARASITE OF IMMATURE STAGES OF THE LADY-BEETLE COCCINELLA UNDICEMPUCTATA. L.G. Karaman. M.Tantawi. E.Kamel and F.Ali. College of Agriculture, Minia University Minia, Egypt.

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Two organophosphorus insecticides (chloropyrifos-methyl and formothion), two synthetic pyrethroids (deltamethrin and cypermethrin), two IGR's (Dowco 439 and IKI 7899) and methomyl as carbamate compound (four dosages/compound) were applied in laboratory tests using dipping technique method to evaluate their effect on the pupae of the lay-beetle Coccinella undicempunctata that are completely parasitized by the gregarious endoparasite, Tetrastichus coccinelli. Results showed that chloropyrifos-methyl has a tremendous effect on the adult eclosion of the parasite from the pupae of the predator and where the percentage inhibition of adult emergence was reached 100% even at the lowest dose used. Meanwhile, the IGR IKI 7899 has the lowest effect on the parasite emergence and where % inhibition of adult emergence was 15% for the highest dose applied. Other compounds such as cypermethrin, Dowco 439, deltamethrin, formothion and methomyl came in descending order from the view point of their inhibition of the adult eclosion. Data also showed that the compounds of deltamethrin, formothion, Dowco 439 were of high effect on the general reduction of the number of alive parasites that emerged from the pupae of the predator in comparison to that of the compound IKI 7899, which had the least effect. The other two compounds, methomyl and cypermethrin were of moderate effect. Numbers of survived adults parasite for each compound 48 and 96 hrs post-treatment were illustrated and discussed.

BIOECOLOGY OF NIPAEOCOCCUS VIRIDIS (NEWSTEAD). N.Sharaf, Department of Plant Protection, Faculty of Agriculture, University of Jordan, Amman, Jordan.

Until recently, Nipaecoccus viridis (Newstead) was referred to as N.vastator (Maskell). This species has been recorded attacking 95 species of varieties of plants in 73 genera and in 34 families. It is widely distributed through much of the tropical and subtropical belts. It is considered one of the main insect pests attacking citrus in the Middle East countries. The biology of this insect is affected by many abiotic and biotic factors; of which temperature, relative humidity and host plant are the most important. On citrus, this mealybug lays an average of 400-600 eggs. The eggs hatch in about 10-21 days into dark-red or purplish nymphs. The nymphal period lasts for about 20 days. N.viridis reproduce continuously throughout the year, with some retardation of development during the winter months. There are 6 overlapping generations.

THE ROLE OF THE GREEN APHID-LION, CHRYSOPA CARNEA (NEUROPTERA, CHRYSOPIADAE) IN THE REGULATION OF THE POPULATION DENSITY OF THE GREEN PEACH APHID AND THE CABBAGE APHID AND THE POSSIBILITY OF USING IT IN BIOLOGICAL CONTROL. M.K.Hussein and N.Kawar. National Council for Scientific Research, and Faculty of Agricultural and Food Sciences, American University of Beirut, Lebanon.

The population density of aphid species in nature, is faced with a considerable number of predators and parasites, that balance its population, and prevent its wide spread. Ten species of parasites and six species of predators that attack 18 different aphid spp. infesting crops in Lebanon, were isolated, among which the green aphid-lion Chrysopa carnea, that is considered to be a polyphagous predator that can attack a number of aphid spp. It was found that the larvae of this predator can eat between 5-15 aphids per day, and around 400 aphids during its larval stage. Its efficiency during its second larval instar at a ratio of 1 to 5, decreased the green peach aphid (Myzus persicae) on sweet pepper by 87%, and the cabbage aphids (Brevicoryne brassicae) by 70%.

PREMIERE APPROCHE DE CERTAINS ENTOMOPHAGES EN SYRIE. K.Alrouechdi. Faculté d'agriculture, Université de Damas, Syrie.

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Au cours de nombreuses excursions dans les régions syriennes, et surtout aux alentours de Damas, nous avons rencontré un grand nombre d'entomophages (parasites et prédateurs). Au niveau des prédateurs, on obtient des chrysopides, des coccinelles, des syrphides, des anthocorides et des acariens prédateurs. etc. dans les vergers (surtout: oliviers, abricotiers, pommiers..). En ce qui concerne les parasites, nous avons trouvé surtout ceux qui attaquent les ravageurs du chou: piéride du chou, aleurode, puceron cendre et un nouvel insecte pour le Moyen-Orient (?): c'est le psylle du chou (Trioza sp.), ceci à côté des parasites attaquant plusieurs espèces de pucerons, et d'autres qui parasitent les prédateurs.

EFFICIENCY OF NEW PESTICIDE TO CONTROL COLORADO BEETLE. N.Sicora, Plant Protection Institute, Kiev - USSR. Y.Karineh - Agro - SCI. Research - Douma - Syria.

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Colorado beetle is one of the most important potato insects in the world. Out of 11 insecticides tested against the beetle in vitro, the following insecticides were selected to evaluate their effect in field trials under environmental conditions of Ukraine - SSR: Decis, Pancel, Phtalofos, Dursban, Faloton, Chlorofos. Decis (2.5%) proved to be highly effective in controlling this insect's adult and larval stages. Phtalofos (20%) and pancel (50%) were fairly effective in controlling the insect's larval stage only.

INTEGRATED (CHEMICAL AND BIOLOGICAL) CONTROL OF THE CORN STEM BORER SESAMIA CRETICA LED. K.M.Al-Adil, A.I.Al-Sammriah and R.F.Al-Jassany. Plant Protection Department College of Agriculture, Abu-Ghraib, Baghdad, Iraq.

Chemical and biological control methods were evaluated against corn stem borer. Results indicated that two sprays of a 500 gm/ha of Bacillus thuringiensis was more effective than any of the chemical applications. Diazinon granules 10% reduced the population density better than DDVP, Diazinon EC60, Metasystox and Ekatin. Good control was obtained following B.thuringiensis and diazinon EC60 mixture treatment, whereas ekatin inhibited the impact of the bacteria. All chemical and biological applications significantly lowered the population density of the borer below than that of the control.

CHEMICAL CONTROL OF TOMATO FRUITWORM HELIOTHIS ARMIGERA HB AT DIFFERENT INFESTATION LEVELS ON TOMATO IN P.D.R. OF YEMEN. S.A.Ba-Angood<sup>1</sup> and M.A.Hubaishan<sup>2</sup>. (1) Faculty of Agriculture, University of Aden, and (2) Elkod Agric. Res. Center, Min. of Agriculture, Aden, PDR of Yemen.

The result of 3-year field experiments (1980/81, 1981/82 and 1982/83) showed that there is significant difference in the reduction of infested fruits by Heliothis armigera and subsequent increase in yield in treatments that received two sprays when percentage of infested fruits was 10% and also in these which received only one spray with tetrachlorvinphos when percentage of infested fruits reached 15%; when compared with other spray treatments at 20% and no spray treatments. When we took into consideration the cost of chemical control operations, we found that one spray at 15% fruit infestation is more economic than two sprays at 10% infestation.

STUDIES ON POTENTIAL NATURAL ENEMIES FOR BIOLOGICAL CONTROL OF SOME MAJOR INSECT PESTS IN U.A.E. S.A.Ba-Angood, Faculty of Agriculture, University of Aden, P.D.R. Yemen.

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The present study reports on a survey of natural enemies where over 20 species of predators and parasites were collected in the period 1982-83. Parasitism of Aphidius spp. and Aphelinus spp. on aphids ranged from 60-90% in greenhouses. Percentage of parasitized aphids in the field ranged from 5-30%. Calosoma chlorostictum a predator consumed 1-2 grasshoppers or 2-6 caterpillars or 2-6 maggots or 1-2 crickets daily. Each larva and adult of Coccinella septempunctata consumed 3-31 and 3-7 aphids daily, respectively; while Chrysoperla carnea larva consumed 4-40 aphids daily. Each nest of the predator Sphex ichneumoneus consisted of 1-23 cells and the number of caterpillars (mainly Spodoptera spp.) collected in each cell ranged from 2-9 larvae. The predator took 25-45 days from egg laying to adult emergence.

INTEGRATED CONTROL OF CORN STEM BORER SESAMIA CRITICA LED (CULTURAL CONTROL). K.Al-Adil, A.I.Al-Sammriah, R.F.Al-Jassany. Plant Protection Department, College of Agriculture, Abu Ghreib, Baghdad, Iraq.

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The influence of corn varieties, row spacing and fertilization were studied on the population density of corn stem borer. It was observed that var. Neelum was the most susceptible to the infestation while var. Dinbreviski was resistant. In the case of fertilization there was a positive correlation between the abundance of nitrogen and the increasing of the larval population density. Referring to the row spacing it was found that a 20 cm between the plants gave more corn production and lower population density of stem borer.

INSECT NEUROMUSCULAR SYNAPSE A NEW TARGET OF ORGANOPHOSPHATE COMPOUNDS. M. Idriss, Dept. Plant Protection, Univ. Alexandria, Faculty of Agriculture, Alexandria, Egypt.

The actions of diisopropyl fluorophosphate (DFP), an irreversible anticholinesterase (Anti-ChE) agent, were studied on the glutamatergic neuromuscular synapses of insects. The present study reveals that DFP interacts with pre and post-synaptic regions, also it gives alternative explanations of the symptoms of organophosphate poisoning in insects. Exposure of the metathoracic flexor tibialis muscle of Locusta migratoria to DFP (0.5nM), at physiological solution contained normal external calcium concentration (2nM), increased spontaneous neurotransmitter release which was large enough to trigger action potentials (APs) and endplate potentials (EPPs). A cyclic pattern of APs and EPPs bursts and silence periods were recorded. The spontaneous firing of APs and EPPs was calcium dependent. Reduction of external calcium concentration abolished this phenomenon, suggesting a presynaptic site of action of DFP. A transient presynaptic depolarization, caused by the agent could explain the spontaneous transmitter release and repetitive EPPs firing. The spontaneous activity induced by DFP, was blocked by a sodium channel blocker such as tetrodotoxin. Exposure to  $\alpha$ -bungarotoxin,  $\alpha$ -Naja toxin or atrophine did not affect the spontaneous release of the transmitter induced by OP agent. Coupled with the presynaptic effect, a decrease in the peak amplitude of endplate current (EPC) and shortening of the decay time constant (EPC) recorded after exposure to the flexor muscle to 1mM DFP. Both the pre- and post-synaptic effects of DFP were reversible upon washing the preparation. The present findings shift the focus of the occasioners of hyperexcitation of insect treated with OPs from indirect effects of these compounds on the central nervous system (CNS) to direct effects on neuromuscular junctions and indirect effects on CNS.

SURVEY IMPORTANT ECONOMICAL AGRICULTURAL PESTS IN SAUDI ARABIA . N.H. Abu Thuraya. Plant Protection Division, Ministry of Agriculture and Water in Riyadh, Saudi Arabia. Present address: Golden Grass, Inc. P.O.Box 21570, Riyadh 11485, S.Arabia.

The work of the author and previous partial work of many experts and casual visitors to Saudi Arabia during the last 27 years were assembled and summarized. This effort covered the scientific classification english and latin name, host plants, localities, season of occurrence and economic importance of insects, mites, fungi, bacteria, nematodes, viruses and parasitic plants. The present work aimed to survey the important economical Agri pests in Saudi Arabia which could be destructive in the absence of pest control programs.

ETUDE DE L'EFFET COMBINE DU TRAITEMENT A L'AZOTE ET DE L'IONISATION CHEZ LE  
TRIBOLIUM CONFUSUM . C.Bali - CEA - SYRIE.

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Au cours de cette étude, on a trouvé que le pourcentage de mortalité des adultes s'accroît positivement avec la durée du traitement à l'azote tout seul ainsi qu'avec l'ionisation tout seul. Après le traitement à l'azote seul la mortalité commence dès le premier jour tandis qu'elle ne commence qu'au 9ème jour après l'ionisation. En ce qui concerne l'effet de combinaison entre le traitement à l'azote et l'ionisation, on a observé que pour un traitement à l'azote de 10 H. (suivi par l'ionisation) amène à une différence très nette entre les effets des différentes doses. En effet, on obtient un pourcentage autour de 50% même plus au premier jour; la dose de 378 GY (qui est appliquée après 10 H azote) causait une mortalité très forte près de 96%, ce qui affirme l'objectif de présent travail: trouver la dose la plus basse qui provoque la plus haute mortalité et dans un délai assez réduit.

SEASONAL ABUNDANCE OF THE ALFALFA WEEVIL, HYPERA POSTICA (GYLIENHAL) IN BAGHDAD.  
F.Al-Zubaidi<sup>1</sup>, A.Al-Khayatt<sup>2</sup>, Biology Dept. College of Science, Baghdad University,  
Baghdad, Iraq.

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Seasonal distribution of the alfalfa weevil, Hypera postica was studied in Kadhimiya, Baghdad, from November 1, 1983 until October 31, 1984. Samples were taken weekly, by using a standard sweeping net. Results indicated that the first appearance of the larvae was the second week of January. They exceeded the economic threshold level during the first week of March and continued until the end of the third week of the month. Larvae had completely disappeared from the field by the last week of July. Temperature threshold of the larvae ranged between 15-20°C. The adults were found almost, year round. No adult hibernation or estivation sites were located in the field. The data also, showed that this insect has two generations in Baghdad.



SEX PHEROMONES AND ASSOCIATED ORGANS IN THE ERI-SILK WORM PHILOSAMIA RICINI (BOIS-DUVAL). M.A.Eid, M.A.Salem and S.A.El-Maasarawy, Faculty of Agriculture, Cairo University, Cairo, Egypt.

The first part of this work treated the recognition of the female sex pheromone and the responsiveness of males to the extract. Bioassay and stability of the sex pheromone were studied. The pheromone glands were described in female pupae and adults. The sex pheromone releasing area were scanned by the electron microscope. Antenna with special reference to the sense organs, were morphologically described.

COTTON INSECTS CONTROL IN DEIR EL-ZOR PROVINCE PARTICULARLY, EARIAS INSULANA. A.R.Barbandi, Plant Protection Division, Ministry of Agriculture, Damascus, Syria.

Many insects attack cotton crop namely. Agrotis ypsilon, Laphygma exigua, Heliothis armigera, Earias insulana, Pectinophara gossypiella, Aphis gossypii, Thrips tabaci, Empoasca facialis, Creontiades pallidus, Bemisia tabaci, Earias insulana is the most dangerous insect. It appears late in may each year. Damages occur in the beginning of August. Field observations through 20 years showed the right timing to control this insect in the beginning of August. This fact has been approved by sex pheromone traps introduced by Dr. Campion in 1981. Infestation rapidly increased in August to attain 35% sometimes., Earias insulana can be successfully controlled at infestation rate 1-2%. High mortality 1982 was achieved up to 100%. Aerial application using U.L.V. was more effective than ground equipment. Different insecticides were used. Pyrothroid products were distinguished.

THE ECOLOGICAL AND BIOLOGICAL CHARACTERISTICS AND THE BIOTIC POTENTIAL OF THE WHITEFLY TRIALEURODES VAPORARIORUM (WESTW.) (HOMOPTERA: ALEYRODIDAE). A.H.Treifi, Head of Plant Protection division. Agric.Sci.Res.Center, Jable - Syria.

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The life cycle of the different stages of the whitefly Trialeurodes vaporariorum (Westw.) was studied. It has been found that the shortest period for the development of this insect from egg to adult stages at temperature 22-27°C and 79-87% R.H. is (21-24 days). Experiments which were done for two years showed that the natural death of the insect was not so high and its average 5.8-15.9, 5.4-8.2, 9.6-12.0% for egg, larval and pupal stages respectively. Upon relying on the analysis of the dynamic of the insect numbers which we call the analysis factor K, this indication expresses the logarithmical difference for the precedent and succeeding insect stage. It is known that when the insect population has biotic equilibrium then  $\log F = K$ , if biotic potential is weak the  $\log F < K$ , but if biotic potential is strong the  $\log F > K$ . Where F-Fertility, K-death during one generation. It was proved that  $\log F = 1.641$ ,  $K = 0.114$ , thus the difference between them 1.527 and that means that the population of the whitefly was very strong and had the capacity of high biotic potential.

PERSISTANCE OF PHOSFOLAN (CYOLANE) IN TWO DIFFERENT TYPES OF SOILS. M.Belal, H. Salama, M.M.El-Sayed and M.Abdel-Salam.

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The Persistence and uptake of Cyolane in a granular and an emulsifiable concentrate formulations in uncultivated and cotton cultivated clay and clay loam soils were studied. The highest residue levels were recorded in the bottom soil layer approximately three weeks after application. Differences between the two soil types and two formulations were small. The degradation of Cyolane was not affected by soil type. Thin layer chromatography revealed the presence of the parent compound plus two degradation products. The degradation products were the same in the cultivated and uncultivated soils. The parent compound and the same two degradation products detected in the soil were also found in the cotton seedlings and plants treated with Cyolane. In the vegetative parts a third compound appeared 4 weeks after treatment. In the roots, an additional compound appeared 2 or 4 weeks after applying the E.C. or granules respectively. The maximum residue level in the vegetative parts was recorded eight weeks after application. In the clay soil, plants took up more than in the clay loam soil. Higher amounts were absorbed up in the treatments with the granules than with the emulsifiable concentrate.

A STUDY ON PUPA OF (DACUS OLEAE) (GHELIN) (DIPTERA, TEPHRITIDOE) IN THE NORTH WEST Jamahiriya. N.M.Layas, and Ab.A.Ben Saad, Faculty of Agriculture, Al-Fateh University, Tripoli, Libya.

The study was carried out in four different ecological locations in the north west of Jamahiriya. Cages were randomly set on four directions and five orientations during the period January - December 1983. The result revealed that larvae of the olive fruit fly (Dacus oleae (Gmelin)) had pupated inside fallen infested fruits, on the soil surface, among debris and in the soil. The pupation depth varied with location from 2 cm to 6 cm with maximum 4 cm in the coastal regions and 6 cm in the internal and mountain regions. Average number of pupae in all locations was 301/m<sup>2</sup>. The prepupal and pupal stages were subject to predation by Formicids and Carabids, both stages were also subject to malformation due to a number of factors. A percentage of pupae ranged between 28% and 50% gave rise to Opius concolor (Szepl.). The distribution of pupae in the soil was significantly affected by locations and directions.

ACTION OF A SYNTHETIC PYRETHRINOIDE (DELTAMETHRINE) ON THE REPRODUCTION OF SESAMIA NONAGRIOIDES LEFEBVRE (LEPIDOPTERA, NOCTUIDAE). M.N.Al-Salti. Department of plant protection, Faculty of Agriculture, University of Aleppo, Syria.

The sensibility spectres of S.nonagrioides lef. larvae at the beginning of third and final stage were established for 4 insecticides (Carbofuran, Deltamethrine, Diflubenzubenzuron and Dimethoate). The study shows the effect of sublethal doses of Deltamethrine on the mating rate and oviposition in the survivant adults being in contact with treated Maïs plants. The doses of Deltamethrine studied were 1.25-2.50 and 5.00 g/ha. A control treated with a solution of Ethanol was constituted. The noxious effect of a low dose of this insecticide (1.25 g/ha) was tested on the progeny of six successive generations. It causes a slight increase (1.5 time) of LD 50 of G<sub>0</sub> till F<sub>5</sub>, and (5.8 time) from G<sub>0</sub> till F<sub>6</sub>. We have observed, as well a modification in larvae behaviour of the F<sub>5</sub>: they escape from the treated zone. It seems that the insect could develop a resistant strain after several applications of the chemical. Finally, we have seen that the Diflubenzuron had the same effect as Deltamethrine on larvae, in addition, the first had a small effect on entomophagous insects. It is important therefore, to take this in consideration when we have to select an insecticide to control this pest.

SOME BIOLOGICAL CHARACTERISTICS OF THE MOLE-RAT (SPALAX LEUCODON) AND ITS CONTROL IN NORTH SYRIA. L.Al-Mahdi. International Center for Agricultural Research in the Dry Areas (ICARDA). P.O.Box 5466, Aleppo, Syria.

The mole-rat belongs to the family Spalacidae, and the predominant species in north Syria is Spalax leucodon(Nordman). Studies conducted in Aleppo showed that it is about 15 cm long, 35 to 45 cm in diameter and about 100 to 140 g in weight. It damages faba bean and watermelon plant just below ground level, and to other crops on the lateral roots. Laboratory tests revealed that this animal prefers carrots and geranium tubers to onions and garlic. Different control methods were evaluated and mole-rat control was expressed as percent of number of holes before treatment minus the number of holes after treatment as compared to the number of holes before treatment. Results obtained indicated that (a) digging and gun methods gave 100% control, (b) phostoxin, methyl bromide and car exhaust gas gave 67%, 100% and 100% control, respectively, (c) poisonous bait (zinc phosphide) with tubers of Geranium tuberosum, slices of carrots, garlic gloves and wheat seeds gave 75%, 60%, 38% and 27%, respectively, and (d) fluoroacetamide achieved 31% control. The above findings showed that the use of exhaust gas was the best method for controlling mole-rat. Exhaust gas can also be obtained from a tractor or a motorcycle.

THE USE OF HIGH AND LOW FREQUENCY ELECTROMAGNETIC WAVES TO CONTROL INSECTS OF STORED GRAINS. A.Jbara. Damascus, P.O.Box 6096, Syria.

When high frequency (2735 mega hertz) and low frequency (27.12 mega hertz) electromagnetic waves were used for the control of stored grain insects, good control was achieved over a very short time treatment without any side effect on grain quality.

THE EFFECT OF RELATIVE HUMIDITY ON THE LONGEVITY AND NUMBER OF EGGS DEPOSITED BY THE FEMALES OF TETRANYCHUS CINNABARINUS BOISD. T.Allawi. University of Jordan, Faculty of Agriculture, Department of Plant Protection, Amman, Jordan.

The effect of three different relative humidity regimes, 75-85%, 50-65% and 10-20% on the longevity and the number of eggs deposited by the carmine mite Tetranychus cinnabarinus Boisd. Female was studied. Mites were reared on castor bean leaves at the conditions of  $26 \pm 1C^{\circ}$  and photoperiod of 16 hours light: 8 hours of darkness with fluorescent light. It was found that there was no significant effect between the first and second relative humidity regimes used, while there was a negative effect on the females reared at the 10-20% relative humidity.

ENVIRONMENTAL POLLUTION BY PESTICIDE RESIDUES AND THEIR SIDE EFFECTS. A.A.W.Abdel-Gawaad. Plant Protection Dept. Faculty of Agriculture, Moshtohor, Kalubia, Egypt.

The use of pesticides involves the injection of these toxic substances into the natural system which has but a limited capacity for adjustment to such disturbances. In developed countries, large quantities of pesticides are used annually. More than 50% of these quantities end up in the soil, persist for a long time and accumulate year by year. In developed countries, such benefit and risks are evaluated. The ultimate goal of these evaluation is to maintain a proper and safe quality of life and to improve the human living conditions. In any analysis of the relation between agriculture and the environment, one must take into consideration the balance between the need to feed humans and the need to protect man and his environment. In developing countries, most of the attention is directed to increase food production with very little attention to the hazards to the environment. More details related to the side effects of these pesticide residues will be presented.

EVALUATION OF A NEW VINYLPHOSPHATE, METHYLBROMFENVINPHOS AGAINST SOME STORED PRODUCT INSECTS. M.A.Khalifa, M.A.Ashry and Z.Shineshin. Plant Protection Dept. Faculty of Agriculture, Kafr El-Sheikh, Tanta University, Egypt.

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Laboratory experiments were conducted to evaluate methylbromfenvinphos (0,0-dimethyl-0-1) (2,4-dichlorophenyl) -2-bromovinylphosphate) against Tribolium confusum Jacqueline Duval, Tribolium castenum Herb. and Tenobroides mauritanicus (L.). Methylbromfenvinphos EC was diluted with acetone and applied to the inner surface of petri dishes to provide a desired deposit on the treated surface. LC<sub>50</sub>'s were determined and ranged between 0.09 - 0.10 mg/m<sup>2</sup>. Insecticide persistence on treated surface was assessed biologically at 1 and 4 mg/m<sup>2</sup>. Both doses were provided 100% mortality for 5 weeks. At 4 mg/m<sup>2</sup> 100% mortality remained until 8 weeks. The experiments indicated that methylbromfenvinphos can be used as an effective insecticide against some stored product insects.

UNE METHODE POUR DETECTER LA PRESENCE DE CARBENDAZIM, FONGICIDE SYSTEMIQUE DANS LES ARBRES. M.Tawil. Faculte d'Agronomie, Universite de Tichrine, Lattaquie, Syrie.

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Pour detecter la presence du Carbendazim dans les arbres, on a trouve une methode simple, rapide et tres sensible. Elle est appliquee en particulier sur les arbres du platane atteints d'une maladie, la tache chancreuse. Cette methode est biologique, une partie des rameaux est transformee en sciure tres fine, mise en contact avec les spores de champignon sur un milieu gélifié, après un certain temps on constate la presence d'une zone d'inhibition autour de la sciure, dont le diametre est en fonction de la quantite du produit. La sensibilite de cette methode est de 0,08 ppm carbendazim. Ainsi nous avons étudie l'activite systemique du carbendazim et la migration du produit dans le tronc et vers les feuilles.

ADAPTATION DE TESTS BIOLOGIQUES A LA DETECTION DE RESIDUS DE METHABENZTHIAZURON DANS LE SOL. S.Tabbache<sup>1</sup> et H.Frochot<sup>2</sup>. (1) Faculté d'Agronomie, Université de Tichrine, Lattaquié, Syrie, et (2) INRA-CNRF, 54280 Champenoux, France

Des modifications sont apportées aux techniques utilisées par plusieurs auteurs afin d'améliorer la précision et la sensibilité. Le test biologique en culture hydroponique se montre très sensible et permet d'estimer les résidus de methabenzthiazuron compris entre 0.04 et 0.16 ppm: il est utilisé pour choisir une plante test sensible, la moutarde, et déceler les résidus de l'herbicide dans un extrait aqueux du sol. Le test biologique en mélange sol-sable sert à détecter directement l'herbicide d'un échantillon de sol donné. La comparaison avec une gamme de référence permet une détermination quantitative du methabenzthiazuron pour les concentrations comprises entre 0.1 et 2 ppm. Utilisé à l'étude du comportement du methabenzthiazuron dans le sol d'une pépinière, ce test se montre très performant en comparaison d'analyses en phases gazeuses.

BEHAVIOR OF MEPHOSFOLAN (CYTROLANE) IN COTTON PLANT AND IN SOIL. M.M.El-Sayed, H.Salama, M.Belal and M.Abdel-Salam.

This study investigated the behaviour of Cytrolane applied as emulsifiable concentrate or granules in clay or clay loam soils, its uptake by cotton plants and distribution in the roots and vegetative parts, as well as its break down in the soil and in the plant tissues. The type of formulation made no difference. The degradation of the compound was not affected by the soil type used. The residue moved downward to the bottom layer, during three weeks after application. Thin layer chromatography revealed the presence of the parent compound and two degradation products during twelve weeks. In cultivated soil the behaviour of Cytrolane was almost the same as in the uncultivated soil. Uptake by cotton seedlings and plants proceeded similarly in all treatments. Larger amounts of the insecticide were found in the vegetative parts than in the roots. The maximum residue level in the vegetative parts was recorded eight weeks after application. In the clay soil, plants took up more of Cytrolane than in the clay loam soil. Higher amounts were taken up in the treatments with granules than with the emulsifiable concentrate. Cytrolane-treated cotton plants produced the same degradation products that were detected in the Cytrolane treated soil, the parent compound plus three metabolites. A fourth metabolite was detected in the foliage and roots 3 and 4 weeks after treatment, respectively.

EFFECTS OF FERTILIZER AND HERBICIDE ON WHEAT PRODUCTION IN FARMERS' FIELDS.

A.Dakermanji and S.Kukula, The International Center for Agricultural Research in the Dry Areas (ICARDA), Aleppo, Syria.

In 1984/85, unreplicated 2<sup>2</sup> factorial trials were sown in 18 farmers' fields in the main wheat growing region of North-West Syria. Four treatment combinations:  $\pm$  weed control (bromoxynil + diclofop methyl, 0.5 + 1.0 kg ai/ha), and  $\pm$  fertilizer (60 kg/ha P<sub>2</sub>O<sub>5</sub> with seed + 80 kg/ha N, half at planting, half as top dressing) were tested. Weed dry matter production and grain and straw yields were measured. The locations were divided into severe weed infestation sites (8) and moderate infestation sites (10) for separate analysis. Results showed that at the moderate infestation locations, there was significant response to fertilizer in both presence and absence of weed control, however, herbicide only gave significant responses in the presence of fertilizer. At the severe infestation locations, there was a significant main effect response to both weed control and fertilizer, but again, a significant interaction indicated that the largest yields were obtained when both were used together. In economic terms, the greatest increase in net income occurred where both treatments were applied. The use of fertilizer without weed control hardly paid for itself. Weed control alone was profitable only on severe infestation fields. The implication is clear: fertilizer must be used in conjunction with weed control if large rates of return are to be expected.

EFFECT OF HERBICIDES ON WEED CONTROL IN CORN. A.R.Saghir, M.Daou, M.Haidar, F.Saad and M.Naamani, Faculty of Agricultural and Food Sciences, American University of Beirut and National Council for Scientific Research, Beirut, Lebanon.

Two experiments were performed during 1984 and 1985 to evaluate the efficacy of herbicides for the control of weeds in corn fields, located at Housh Sneid Farm, in the Beqa'a region of Lebanon. The herbicide Laddok (bentazone + atrazine) was sprayed at the rates of 1.2, 1.6 and 2.0 kg/ha (a.i.) 20 days after seeding corn. The results showed that 35 days after herbicidal application, the dry weight of the following weeds: Amaranthus gracilis, Avena sterilis, Chenopodium album, Convolvulus arvensis, Lolium spp., Portulaca oleraceae, Setaria viridis and Tribulus terrestris, was decreased by 69.5, 77.5 and 91.9%, respectively, when compared to the unweeded control. The herbicide did not cause any phytotoxic symptoms on corn at any of the rates tested. The yield in the treated plots was not significantly different from the handweeded control, but it was higher than the unweeded control. In addition, Laddok had no effect on protein content of the kernels. In 1985, the soil was treated just before planting corn, with the following herbicides: Eradicane (EPTC + R 25788) at the rates of 2.5, 4.5 and 6.6 kg/ha (a.i.); Sutan + (atrazine + butylate) at the rates of 2.6, 4.7 and 6.8 kg; Primextra (metalachlor + atrazine) at the rates of 2.0, 2.5 and 3.0 kg. It was found that Primextra had a high efficacy in controlling the above mentioned weeds at all the rates tested, specially Tribulus terrestris. However, the other herbicides were moderately effective. The herbicides did not show any effect on the forage yield except Primextra at 4.0 kg which increased the yield by 56% as compared to the handweeded control.



IMPORTANCE OF AGRICULTURAL ROTATION AND EFFECT OF WEEDS ON SOIL MOISTURE AND YIELD IN THE DRY AREAS. M.Jbair, The Arab Center for the Studies of Arid Zones and Dry Lands (ACSAD), Damascus, Syria.

Results of the research for this season indicated the effect of agricultural rotations on yield and economic returns in the rainfed areas. The best wheat production in the two rotations Wheat/Lentil and Wheat/Fallow was obtained in the 5-10 cm cultivation. The moisture consumption in the rotation Wheat/Lentil was higher than Wheat/Fallow. Thirty percent higher weeds weight was recorded in the rotation Wheat/Fallow compared with Wheat/Lentil. The amount of absorbed nutritional elements by weeds was 53.6 kg N/ha, 74.4 k<sub>2</sub>O/ha, and 6.2 kg P<sub>2</sub>O<sub>5</sub>/ha. The economic returns reached at 9116.6 SL/ha in the rotation Wheat/Lentil compared with 356.5 SL/ha in the rotation Wheat/Fallow. The highest dry weight of weeds (5600 kg/ha) was recorded in the 20 cm cultivation. The best economic returns was recorded in the hand weeded treatment (two times the weedy control). In the herbicide treated plots the economic returns was 80% higher than in the weedy control.

EFFECT ON TILLAGE SYSTEMS ON THE WEED COMMUNITY IN A TWO-COURSE ROTATION (LENTIL-WHEAT). S.Dozum<sup>1</sup> and M.K.Dermoch<sup>2</sup>. (1) The International Center for Agricultural Research in the Dry Areas (ICARDA), Aleppo, Syria and (2) Faculty of Agriculture, University of Aleppo, Aleppo, Syria.

The effects of tillage systems on the weed community were studied in a two course rotation, (lentil-wheat), for seven seasons. Tillage treatments included the use of conventional seed bed preparation and sowing at three different times (conventional early; conventional middle; conventional late) and no-tillage planted either before or after the start of rain (no-tillage early; no tillage middle). Comparison of conventional versus no-tillage systems indicated that the total number of weeds (TNW) and in particular the number of wild oat (Avena sterilis) and canary grass (Phalaris brachystachys) was reduced by tillage. Some weed species increased heavily during this period, clover (Trifolium spp.) in no-tillage early and Burr parsley (Caucalis leptophylla) in no-tillage middle. Comparison between dates of planting in the conventional tillage showed that harrowing after the first rain (conventional middle), and plowing after the first rain and harrowing after the second rain (conventional late) reduced the TNW and the number of wild oat plants. In the no-tillage, spraying paraquat or glyphosate before planting and after the emergence of weeds (no-tillage middle), effectively reduced the TNW and the number of clover.

WATER HYACINTH IN SUDAN. Z.E.Elabjar<sup>1</sup> and M.O.Bashir<sup>2</sup>. (1) Agricultural Research Council, NCR and (2) Faculty of Agriculture, University of Khartoum, Sudan.

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Water hyacinth (Eichhornia crassipes) gained access to the Sudan in the late 50's. By 1962 the weed spread over the whole stretch of the White Nile and its tributaries, a distance of 3170 km. The weed curtail navigation, increase water loss, close the irrigation canals and pumps and create favourable conditions for the multiplication of some diseases. Control operations started in 1959 by spraying the herbicide 2,4-D. In 1976 a biological control programme was launched using three exotic natural enemies. These are Hoechetina eichhorniae, N.bruchi and Samodes abliguttalis. These enemies are now established and spread all over the infested area.

INFLUENCE OF SOIL MOISTURE ON ACTIVITY AND PERSISTENCE OF GR 24. A.G.T.Babiker, A.M.Hamdoun, A.Rudwan, M.G.Mansi and H.H.Faki. Agricultural Research Corporation, Gezira Research Station, Wad Medani, POB 126, Sudan.

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Germination of Striga hermothica (Del.) Benth seeds in response to GR 24 was strongly influenced by soil moisture prior to, at or after stimulation. Exposure of seeds to excessive soil moisture contents (69.6% w/w) drying conditioning resulted in low response to GR 24. Transfer of seeds from soil at 69.6% moisture to a lower moisture level (47%) for 2 days or more improved the response to GR 24 (37-58% germination), while air-drying restored germination (88%). In Gezira soil the optimum soil moisture contents for maximum response to GR 24 were 48.5, 38.2 and 39.5% during conditioning, stimulation and germination respectively. The corresponding figures for the sandy soil were 19.7, 22.1 and 22.3% respectively. Persistence of GR 24 was independent of soil type, but was strongly influenced by soil moisture contents. The stimulant was stable in air-dry soil, but a rapid loss was encountered in moist soil.

WEEDS OF THE GENUS AMRANTHUS L. IN TUNISIA. T.Hadar, Institut National Agronomique de Tunisie, Tunis, Tunisia.

This work deals with the classification of the genus Amaranthus L. in Tunisia, These weeds have been noticed frequently in irrigated crops in eight northern departments. From the collected samples we were able to identify eight species, one of those is reported for the first time in Tunisia: A.blitoides S.Watson, A.Albus L., A.graecizans L., A.hybridus L., A.cruentus L., A.retroflexus L., A.gracilis Desf. and A.deflexus L. This paper also includes some informations on the distribution and the control of these seeds.

CHEMICAL WEED CONTROL IN POTATOES. A.R.Saghir, M.Daou, A.Attoui, M.Haidar and F.Baba, Faculty of Agricultural and Food Sciences, American University of Beirut, and National Council for Scientific Research, Beirut, Lebanon.

Chemical weed control in potatoes was studied in 1985 at Housh Sneid Farm, in the Beqa'a region of Lebanon. After planting potato tubers, the following herbicides were sprayed: Metribuzin at the rates of 0.5, 0.75 and 1.0 kg/ha (a.i.); metazachlor at 2.0, 3.0 and 4.0 kg/ha; diphenamid at 5.0, 6.0 and 7.0 kg and oryzalin at 1.0, 1.5 and 2.0 kg. The results showed that three months after their application, metribuzin at all rates tested and metazachlor at the rates of 3.0 and 4.0 kg were highly effective in controlling the following weed species: Amaranthus retroflexus, Avena sterilis, Lolium spp., Raphanus raphanistrum, Sinapis arvensis and Xanthium spinosum. However, oryzalin and napropamide showed moderate and low efficacy, respectively. Metazachlor at rates of 3.0 and 4.0 kg particularly caused phytotoxic symptoms on the potato seedlings, characterized by leaf chlorosis and dessication, and an overall decrease in the potato yield that reached 30% as compared to the handweeded control. The other herbicides did not cause any significant effects on the yield. All the herbicides used had no significant effect on the percentage of marketable tuber yield which varied from 82% to 91%. In addition, the starch content was not significantly different as compared to the handweeded control in all the treatments tested.

WILD OAT CONTROL IN SYRIA USING AERIAL APPLICATION. A.R. Barbandi, Ministry of Agriculture and Agrarian Reform, Damascus, Syria.

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Wild oat has become a big competitor to the cereal crops in Syria, particularly in the north-east part and causes yield loss in quantity and quality. This is due to the early competition which starts at very early growth stage. Some competition takes place even at pre-emergence. Total area controlled in 1983 in the Hassake province was 12375 ha using aerial application for the first time. Two herbicides applied (Illoxan and Avenge) which successfully controlled Avena spp. Illoxan showed better result than Avenge. Good coverage was obtained using 80 drops/cm<sup>2</sup> at V.M.D. 165 micron. Yield was increased by 15-20% compared with the untreated blocks. Net profit was 150 syrian pounds per ha. This increment was confirmed in 1984 and 1985 by treating similar acreages.

A GREENHOUSE TECHNIQUE FOR SCREENING FABIA BEAN (VICIA FABIA L.) FOR RESISTANCE TO OROBANCHE SPP. H.Masri, ICARDA, P.O.Box 5466, Aleppo, Syria.

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Field screening of fabia bean genotypes for resistance to Orobanche is often unreliable because of uneven distribution of Orobanche seeds in the soil and the interference of environmental factors in the development of the parasite. For a rapid screening of a large number of fabia bean genotypes, a greenhouse technique was developed. The technique consists of growing test genotypes in a greenhouse (20-21°C), in polyethylene bags, using attapulugus clay as the growth medium, artificially infested with Orobanche seeds. The root system of the plants is examined at flowering (about 65 days after planting) for houstonia attachment after removing the clay. The number of germinated seeds of Orobanche is also counted to get a picture of host genotype differences. Using this technique, differences in resistance of 15 genotypes of fabia bean to Orobanche have been described.

BIOLOGICAL CONTROL OF WATER HYACINTH WITH PLANT PATHOGENS. N.M.El-Tayeb. Faculty of Agriculture, Khartoum University, Sudan.

Fourty species of bacteria, fungi and actinomycetes were isolated and inoculated onto water hyacinth leaves. Eight of these cultures produced significant lesions. Alternaria eichhorniae, Drechslera spicifera and Fusarium equesti were the most virulent. To determine the host range of the above mentioned pathogens, plants from 21 families were tested. A.eichhorniae proved to be host specific, D.spicifera infected sorghum and wheat Fusarium equesti infected most of the plants tested and Acremonium zonatum infected tobacco. The effect of temperature on germination of spores, radial growth and degree of infection were thoroughly studied. Alternaria eichhorniae and Coleophoms sp. have a tendency to grow well at lower temperatures (range 20-30, optimum 25°C). No growth or germination was observed above 37°C); D.spicifera could tolerate a wilder range of temperature (20-40) optimum 30°C). The effect of these pathogens on the growth and productivity of water hyacinth, doubling time computed under different conditions was taken as an index. A.eichhorniae increased the doubling time from 20 to 37 days. D.spicifera increased the doubling time from 36 days to 77 days.

CHEMICAL WEED CONTROL IN TRANSPLANTED ONIONS (ALIMUM CEPA L.) IN THE SUDAN GEZIRA. A.G.T.Babiker and M.K.Ahmed. Gezira Research Station, Wad Medani, Sudan, P.O.Box 126.

Unrestricted weed growth reduced yield of transplanted onions (Alium cepa L.) by 26-48%. Hand-weeding once, 42 days after transplanting reduced the yield loss to 15 %. Application of oxadiazon (1.1-1.3 kg/ha), pendimethalin (1.2-1.8 kg/ha), oxyfluorfen (0.14-0.43 kg/ha) and chlorthal-dimethyl (8.3-13.1 kg/ha) resulted in yields comparable to the hand-weeded control (82-126%). When sprayed at transplanting these herbicides gave excellent and persistent control of grasses (86-100%). However, they were less effective on broad-leaved weeds (38-94% control).

EFFECT OF SOLARIZATION ON SOIL-BORNE FUNGI AND NEMATODES IN THE CENTRAL JORDAN VALLEY. M.A.Al-Sa'ad<sup>1</sup> and W.I.Abu-Gharbieh<sup>2</sup>. (1) Ministry of Agriculture, Amman Jordan, and (2) Faculty of Agriculture, University of Jordan, Amman, Jordan.

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This work comprised two experiments in which five treatments were applied to tomato and eggplant. The treatments included preplant tarping of moist soil with transparent plastic covers (40 $\mu$ ) for one or two months, or with black plastic (45 $\mu$ ) for two months. These treatments were compared with Methylbromide soil fumigation (68g/m<sup>2</sup>) and nontreated control. Maximum soil temperatures reached at 10 and 20 cm depths were : 50 and 44°C under transparent and 42 and 40°C under black plastic, as compared with 40 and 38°C in the nontarped control, respectively. Two months tarping with transparent cover in both experiments was highly effective, and similar to MB fumigation, in reducing number of propagules of Fusarium oxysporum, F.solani, Pythium spp. and Rhizoctonia solani, and nematode counts of Tylenchorhynchus and certain other free-living forms. Tarping with transparent cover for one month and black plastic for two months were less effective, but not significantly less than transparent for two months. All tarping and MB treatments significantly increased plant growth and productivity over the nontarped controls. No significant differences were found between MB and tarping for two months treatments. Transparent cover for only one month resulted in lower yields than those of the other tarping treatments in the tomato experiment, but not in the eggplant experiment.

POPULATION DENSITY OF THE CYST NEMATODE HETERODERA GOETTINGIANA ON CHICKPEA IN NORTHERN SYRIA. M.Al-Balkhi, Directorate of Agricultural Scientific Research Leib. Damascus, Syria.

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The population density of the cyst nematode Heterodera goettingiana affecting chickpea (Cicer arietinum L.) has been carried out in northern Syria during 1984-1985. Soil samples (208) were taken from depth of 25 cm after harvesting and cyst were extracted by Fenwich can, crushed by Sienhorst method. The results showed that 30% of the samples have less than 1 egg/g. soil, 43% between 1-5 egg/g soil and 27% have more than 5 egg/g soil.

EFFECT OF MYCORRHIZAL FUNGI ON MELOIDOGYNE JAVANICA ON TOMATO AND EGGPLANT. H.Saleh and A.Momany, Department of Plant Protection, Faculty of Agriculture, University of Jordan, Amman, Jordan.

Greenhouse experiment on the effect of mycorrhizal fungi on Meloidogyne javanica on tomato and eggplant was made. Plants were inoculated with an isolate of mycorrhiza either preplanting in seedling trays or pretransplanting in pots. Nematode inoculation was done 3 days after transplanting and experiment was evaluated 2 months later. In tomato, plant growth stimulation by the mycorrhizal fungus as well as plant growth reduction by the nematode were not significant. Compared with nonmycorrhizal plants, mycorrhizal ones, inoculated in the seedling trays or in the pots harboured 49% and 76% less nematode respectively. 32% and 45% mycorrhizal roots were found associated with these reductions respectively. Similar results were observed on eggplant.

EFFICACY OF CERTAIN NEMATICIDES IN CONTROLLING MELOIDOGYNE INCOGNITA INFECTING BROADBEAN. A.G.El-Sherif, Faculty of Agriculture, Mansoura Univ., Egypt.

Greenhouse studies on the influence of five systemic nematicides (Temik 10%G, Mocap 10%G, Terracur-P, Vydate 10%G, Acconem 5%G) in controlling Meloidogyne incognita on broadbean showed that all nematicidal applications relatively increased plant growth except in the case of Acconem 5%G where a negative result was obtained. Among the five nematicides tested, Temik gave the best growth of the infected broad bean plants; 17.24% and 203.6% for shoot and root dry weights respectively, and 9.89% and 58.09% for shoot and root lengths, respectively. Temik, Acconem, Mocap, Vydate and Terracur obviously reduced nematode population and number of nematode galls on broad bean plant at all nematicidal treatments. The maximum reduction of nematode population was recorded by Temik applications.

NEMATODE TRAPPING FUNGI IN LIBYAN SOIL. A.Y.Giuma, Plant Protection Department, Faculty of Agriculture, El-Fateh University, Tripoli, Libya (SPLAJ).

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Due to the importance of the nematode - trapping fungi in the biological control of nematodes, a study started at beginning of 1985 and aimed to isolate and identify these fungi from the North West and the South (Shaati) of the country. The result showed the existence of the following genera in Libyan soil: Arthrobotrys spp. and Nematoctonus spp. in the North West region and Dactylaria spp., Dactylella spp., and Monoacrosporium spp. in the South region (Shaati).

EFFECT OF RIYADH SEWAGE WATER ON THE LIFE CYCLE AND DEVELOPMENT OF CITRUS NEMATODE TYLENCHULUS SEMIPENETRANS COBB. F.A.Al-Yahya, A.S.Al-Hazmi, and M.A.E-Saedy. College of Agriculture, King Saud University, Saudi Arabia.

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The life cycle of T.semipenetrans on lime roots required about 4 and 5 weeks with sewage and tap water irrigation, respectively. Second stage larvae penetrated roots within a week. Third and fourth larval stages were observed 2 weeks after inoculation, in both treatments. At this time young females were also observed only in sewage water treatment. By the third week adults were observed in both treatments. A week later, egg-laying females were observed in both treatments. However, numbers of adults and egg-laying females, at this time, were about twice in sewage compared with tap water. The second larval stage of the next generation appeared at the fourth and the fifth week in sewage and tap water treatments, respectively. Consequent development in roots and soil were much higher in sewage than in tap water in the sixth and seventh weeks.



DISTRIBUTION OF ROOT - KNOT NEMATODE (MELOIDOGYNE SPP.) IN LIBYA (SPLAJ), E.A. E.A.Edongali and K.M.Dabaj. College of Agriculture, El-Fateh University, Tripoli, Libya.

A survey was conducted in the southern and in the northern parts of Libya to study the distribution and occurrence of root - knot nematode (Meloidogyne spp.) in the cultivated plants of Libya. The studies revealed the association of this genus with 86 crop plants. The most common species of this genus were: M.javanica, especially in the southern warmer areas, M.incognita, more dominant in northern region, whereas M.javanica and M.arenaria were ranked second in cool northern regions. Their hosts were both woody perennials and herbaceous annuals. Among the woody plants were: date palm (Phoenix dactylifera), almond (Prunus amygdalus), Pomegranate (Punica granatum), Olive (Olea europica), Figs (Ficus carica), Grape (Vitis vinifera), Pecan (Prunus persica), Apple and pears. While the herbaceous hosts were: (Cucumis sativus), Pepper (Capsicum annum), Onion (Allium cepa), Corn (Zea mays), Cabbage Brassica oleracea C.V. Capitata), Cauliflower (Brassica oleracea), Carrot (Carrota sativa) and many others. Some weeds were also found to be as hosts of root - knot nematodes. Among them were: Hound's berry (Solanum nigrum) and chenopodium (Chenopodium album, and C.murale). A control Trails are under way to determine the most suitable methods to reduce potential damage these pests might cause to these crop plants.