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9th TURKISH PHYTOPATHOLOGICAL CONGRESS

The Turkish Phytopathological Society held its nineth Congress in Tekirdağ-Turkey, between the dates of 3-8 September 2001.

A total of about 500 persons from various agricultural and related in Turkey registered for the joint the Congress including the most of the Turkish Phytopathological Society members. In the course of Congress mentioned, 78 scientific papers on several Phytopathological topics were presented.

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J. Turk. Phytopath., Vol. 30, No. 3-4, 57, 2001

BACTERIAL DISEASES

Histochemical localization of lignin and phenolic accumulation in Arabidopsis leaves inoculated by virulent and avirulent bacterial strains

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Inoculation of *Arabidopsis thaliana* leaves with virulent and avirulent strains of *Pseudomonas syringae* pvs. *tomato* (Pst) and phaseolicola (Pph) generated 2 major host responses. Arabidopsis ecotype Col-5 is susceptible to virulent strain Pst DC30000 and interaction between them is called compatible interaction. In this interaction, pathogen caused water soaked lesion, which is accompanied by tissue collapse. Col-5 is resistant to avirulent strains of Pph 1448A and transconjugants and interaction between plant and these strains is called incompatible interaction. Although limited bacterial growth observed, no macroscopic symptom developed in leaves inoculated with Pph. Transconjugants, carrying avrPpiA and avrPphB genes, activated resistance genes, RPM1 and RPS5, leading cell death, indicating hypersensitive reaction (HR) and changes in cell wall structures. Accumulation of phenolic and lignin was determined in infected tissues by using epifluorescence microscope and histochemical staining. No staining of lignin and phenolic accumulation was observed during compatible interactions. Significant and striking autofluorescence of phenolic and lignin staining were observed at infection sites in tissue inoculated with avirulent transconjugants. Histochemical studies showed that development of HR during incompatible interaction was closely associated with accumulation of phenolic and lignin. Both lignin and phenolic were generally localized in walls and protoplast of mesophyll cells undergoing the HR. Timing and intensity of cell response to different bacterial strains varied. Reaction to Pph(avrPpiA) was rapid and strong in comparison to Pph (avrPphB).

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Potential life survival of *Erwinia caratovora* subsp. *caratovora* and Erwinia chrysanthemi, stem necrosis agent in the East Mediterranean Region tomato greenhouses

Raziye ÇETİNKAYA-YILDIZ Yeşim AYSAN Özden ÇINAR

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Survival places except vegetation period (seed, soil and plant debris) longevity of the life period on seed, ability of the infected seeds in occuring new infestions and roles on them in first infections of *Erwinia caratovora* subsp. *caratovora* and Erwinia chrysanthemi the causal agent of tomato stem necrosis were investigated. It was found that the pathogens could not survive in soil but they could survive in infected plant debris and seeds and serve as a frist inoculum resource wilted plants from contaminated seeds of diseased fruits showed us that these pathogens are seedborne.

Dispersion of bacterial stem necrosis on tomato grown in greenhouses in the Eastern Mediterranean Region of Turkey and observations in these greenhouses

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Results of surveys conducted in the Eastern Mediterranean Region of Turkey during 1996-1999 tomato growing season indicated that dispersion of stem necrosis caused by soft rot *Erwinia* spp. was 32, 24, 13 and 24 % in plastic greenhouses and the disease incidence was 3.0, 1.9, 1.0, and 2.0 %, whereas stem necrosis caused by Pseudomonas spp was 6, 11, 8 and 17 % in greenhouses and the disease incidence was 1.0, 1.0, 1.0 and 2.9 %, respectively. Disease was intensively observed in the greenhouses with high nitrogen fertilization, high relative humidity, low highth, inadequate ventilation and also in infected plants observed in a previous year. It was detected that the disease was first apspeared on the roots of some plants (may be due to seedborne contamination or soilborne infection) and then spread to the other plants by pruning as cultural practices.

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Preliminary observations on role of rhizobacteria in inducing systemic resistancy (ISR) to bacterial speck disease

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Selected strains of nonpathogenic rhizobacteria (fluorescent pseudomonad and *Bacillus* spp.) from the rhizoplane of various plants were examined in a greenhouse pot tests for their ability to reduce bacterial speck disease severity caused by *Pseudomanas syringae* pv. *tomato*. The suspensions of rhizobacteria (1011 cfu/ml) were applied to the roots and leaves of tomato seedlings grown in pods. Rhizobacteria strains 39A, M4/2, 9, 180, 235, H22, B5 and D7 applied to roots of seedlings reduced the disease severity by 65-80 %. It was determined that these strains of rhizobacteria triggered an induced systemic resistance (ISR) response against infection by the bacterial speck pathogen Pst. Rhizobacteria strains 39A, 9, 180, D1, D6 and D7 effectively reduced the disease incidence by applications both foliar and root. It was thought that both ISR and other common mechanisms of biocontrol could be responsible for effectiveness of these strains of rhizobacteria.

Effect of some plant extracts, volatile oils and compost extracts on tomato stem necrosis pathogens *Pseudomonas viridiflava, Erwinia chrysanthemi* and *Erwinia caratovora* subsp. *caratovora*

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Effects of plant extract and volatile oils (eucalyptus, garlic, thyme) and compost extracts (weed and cow manure composts) on tomato stem necrosis pathogens *Pseudomonas viridiflava*, *Erwinia chrysanthemi* and *Erwinia caratovora* subsp. *caratovora* were studied in vitro and half in vivo (on potato slices) experiments. In the studies two different sterilization method (filtration and autoclaving) and 3 different concentration (50, 40, 30 %) of the extracts were used. Filtered and autoclaved eucalyptus extract and filtered garlic extract in 50 % concentration were effective against all pathogens. But the effect of garlic extract was lost by autoclaving. Thyme extract was not effective for all pathogens. The effect of the extracts was lost by decreasing concentration against stem necrosis pathogens. Weed and manure compost extracts were not effective for all pathogens. All of volatile oils were effective on stem necrosis pathogens in laboratory experiments. On potato slices autoclaved eucalyptus extract was effective completely (100 %) and filtered garlic extract was also effective (46 %) on *Pseudomonas viridiflava*. On the other hand filtered eucalyptus and autoclaved garlic extract did not effect decaying of potato slices by *Pseudomonas viridiflava*. On *Erwinia caratovora* subsp. *caratovora* only autoclaved eucalyptus extract was effective (23 %). No effect by extracts to *Erwinia chrysanthemi* on potato slices was found. It was detected that volatile oils were not effective in vivo tests by potato slices for all pathogens.

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Isolation of *Thermus aquaticus* DNA polymerase enzyme from recombinant Escherichia coli

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In order to isolate of Taq DNA polymerase enzyme pUCR-TaqPol clone and E. coli DH5a bacteria strain as host cells were used. Activation tests were done by comparison with Taq DNA polymerase provided from a company. PCR amplifications were performed with plasmid clone including 264 bp fragment RNA3 of PNRSV and specific primers. PCR amplifications were obtained in all selected concentrations. The best amplification concentration was determined as 0.1 ml/ 25 ml reaction.

Pathogenic bacteria that determined in imported and exported plant propagation material

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The presence of bacterial pathogens in the samples of imported plant propagative materials with International Phytosanitary Certificate depend upon the establishment of tolerances governing pathogenic bacteria was determined. Several methods such as growing-on, plating on common or selective media and Immunofluorescence Microscopy (IF) were used in the detection of bacteria in or on seed and other propagative materials. Individual bacterial isolates were identified by serological, biochemical, physiological and pathological tests. Totally two thousand- four hundred –sixty nine plant propagative units were tested for the presence of some pathogenic bacteria. *Clavibacter michiganensis* subsp. *michiganensis* in 10 tomato seed samples, *Pseudomonas syringae* pv. *phaseolicola* in 3 bean seed samples, *P. viridiflava* in 3 samples (cauliflower and cabbage seed and peach seedlings), *Xanthomonas hortorum* pv. *carotae* in one carrot seed sample, *Acidovorax avenae* subsp. *citrulli* in one watermelon seed sample, *X. arboricola* pv. *pruni* on *Prunus laurocerasus, Agrobacterium tumefaciens* on 2 apple seedling samples, A. vitis on 3 grapevine seedling samples and *Ralstonia solanacearum* on 6 potato tuber samples were detected.

Research on control of fire blight disease by using prediction-warning models

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The Maryblyt version 4.3 model and BIS 95 (Billing Integrated System) were evaluated for the prediction of blossom blight for the growing season in apple and pear orchards in West Anatolia. Temperature and rainfall data were collected by automated data loggers and phenological and disease observations were recorded personally. Studies were carried out for three years (1999-2001) in 7 pear orchards with high disease incidence in İzmir and Bursa provinces and 2 apple orchards in Denizli province. Generally, both models seemed to provide accurate prediction of blossom blight infection risk date on pear but actual symptoms were observed earlier than the model's prediction. In 1999 and 2000, the Maryblyt model and BIS 95 developed by Eve Billing were compared in 2 apple orchards. The models predicted one-four infection periods on the same time but early symptoms occurred earlier than predicted in both orchards. When there were infections conditions predicted by the prediction systems, chemical treatments provided very significant reductions in the amount of blossom blight infection in pear and apple orchards.

Reaction of tomato cultivars to tomato pith necrosis

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Reactions of 21 tomato cultivars to *Pseudomonas corrugata, Pseudomonas viridiflava* and *Pseudomonas cichori* causing tomato pith necrosis were determined. Experiments were carried out in pots in glasshouse in February-April of 2001. Cultivars were artificially inoculated with one isolate of each pathogen. None of the cultivars tested proved to be resistant to the pathogens. Invictus, Platina, Duygu, Shasta, Sun 6109 and Newton F 18402 were foud moderately resistant to *P. corrugata; P.viridiflava* and *P.chicorii*, respectively.

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Biological control research on fluerescence Pseudomonads in control of potato soft rot agent *Erwinia carotovora* subsp *carotovora* (Jones) Bergey et al.

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Erwinia carotovora subsp *carotovora*, one of the important disease agent of potato, causes preemergence seed piece decay, blackleg, soft rot of stem and daughter tubers. This study was made with fluorescent pseudomonads in biological control against *E. c.* subsp *carotovora*. In vitro tests, the biological control activity of 151 fluorescent pseudomonads against *E. c.* subsp *carotovora* were evaluated according to 0-5 scale. Approximately, 84 % of isolates were showing value of category 2, forming inhibition zone between 3 and 9 mm. Pathogenicity tests were made with 50 selected isolates and 10 of them were found to be pathogenic. 40 non-pathogenic isolates were tested for their inhibitive effect on soft rot in the assay of tuber slices. In the experiments with regardless variety of potato the highest inhibition rate was 52 %. However in tests carried out with variety Marfona the inhibition rate was 40 %. These results showed that inhibition of soft rot on slices by fluorescent pseudomonads varied depending on the variety of potato.

VIRUS DISEASES

Plant virus disease management at the beginning of the third millennium

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Plant disease control has been traditionally based on the use of chemicals, which have evolved from simple inorganic elements (e.g. copper, sulphur) to organic compound expressing increasingly higher specificity and efficacy. New concepts have developed with time and new innovative strategies (e.g. integrated pest management, plant health management) have been successfully applied. At the turn of the century, however, following implementation of biotechnological techniques, diagnosis of pathogens and disease control have undergone what appears to be a veritable revolution The most spectacular advances were registered in the management of virus diseases for which no chemical control is possibile. A range of biotechnological applications ("phytopathological biotechnologies") have been exploited for producing "clean" nursery material for propagation (tissues culture, somatic embryogenesis) and providing more advanced reagents for the sensitive serological (monoclonal antibodies, recombinant and synthetic antigens) and molecular (cloned probes, PCR) detection and identification of plant pathogens. The use of recombinant DNA and the optimization of plant transformation systems, together with the transfer into practice of the concept of "parasite-derived resistance" has opened new very promising ways for the obtention of crop plants that tolerate or resist attacks by pests and pathogens, including viruses.

Studies on sampling strategies detection of *citrus tristeza* virus (CTV) by ELISA

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Tristeza is not only still threating agent of citrus in Turkey, but also using the sour orange as a root stock and prevalence of CTV vector may create a potential dangerous pathogen problem in citrus production. ELISA test was used to survey CTV and sample collections. The tests was carried out to collect large scale of samples and their preservation for future testing for detection of CTV by ELISA. The study indicated that young shoots bark was determined as the best tissue to be used for ELISA. The highest absorbance value was obtained from the samples that were collected in May. The samples that were kept – 20 oC in a deep-freezer (for sixth months) has still given a good result. The samples that were taken from one-two years earlier budwood infected plants gave positive result with ELISA.

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Detection of *prunus necrotic ringspot virus* (PNRSV) by using dsRNA analysis

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dsRNA analysis was performed to samples obtained from orchards, germ plasms and plantations of Hatay, Yalova and Çanakkale province. Samples were determined as infected with *Prunus necrotic ringspot virus* (PNRSV) by I-ELISA. 4 apricot and 2 plum of PNRSV isolates were used including 1 plum isolate as negative control in the research. dsRNA isolation was performed as described by Sabanadzovic and Di Terlizzi (1994) method. As a result in one isolate all 3 RNAs (RNA1, 3.662 kb; RNA2, 2.507 kb; RNA3 1.887 kb), in 1 isolate only RNA2 were determined. No band present in negative control.

Detection of infection ratio of stubborn disease in grapefruit varieties in orchards

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Stubborn (*Spiroplasma citri* Saglio et al.) is a major disease of oranges and grapefruit in East Mediterranean region. The infection ratio of stubborn disease on grapefruit trees were investigated. 3517 Star ruby, 383 Rey ruby, 520 Rio red, 803 Henderson, 609 Marsh seedless and totally 5832 trees of grapefruit were investigated. The ratio of the diseased trees were found symptomatologicaly 12 %, by ELISA 28 %, by biological indexing 47 % and with culture method 55 %.

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Investigation of biological properties and dsRNA profiles of four different citrus tristeza virus strains

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Biological characteristics of 4 different virus strains and their dsRNA profiles on Madam Vinous plant were investigated. In addition Iğdır strain, one of the 4 virus strains used, was inoculated in 7 different citrus varieties and its dsRNA profile was then detected in those plants. Cyprus strain among these strains showed symptoms on grapefruit, Madam Vinous, Mexican lime whereas the rest three strains showed symptoms on only Mexican lime. All four strains showed full length of major dsRNA on M. Vinous plant. Moreover, they showed three full length of major or minor dsRNA with 2, 0.8 and 0.5x106 MW. All Seven different citrus varieties inoculated with Iğdır strain showed full length of major dsRNA. Especially the bands in Madam Vinous, rough lemon and *Citrus exelsa* were stronger than the others.

Detection of fig mosaic virus infection by using dsRNA analysis

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Fig (*Ficus carica* L.), the traditional crop of Aegean Region, has been cultivated for both fresh and dried consumption in Aegean Region. Turkey is one of the biggest dried fig producer of the world where almost half of the world's dried fig demand has been provided from this area. Because of its high fruit qualities Sarılop cultivar has been widely grown in this area, however, it is highly sensitive to fig mosaic virus. As a result of vegetative propagation of the cultivar the disease has been distributed to almost all fig plantations. Infected leaves consist of various degrees of mosaic accompanied by yellow-green chlorotic lesions and deformation. Seldom similar chlorotic lesions are also appear on immature fruits. As the disease progresses fruits begin to drop prematurely and in some cases affected trees eventually dry. In the study a method involving dsRNA analyses was applied to determine the etiology of fig mosaic disease of figs since other methods are not adequate. Among the isolations from the leaf samples taken both from infected and healthy figs only the ones made from infected leaves yielded electrophoretic profiles consisting of bands corresponded to lDNA (Hind III) molecules which ranged 0.6 Kbp to 6.6 Kbp.

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Development of wheat integrated pest management model and their implementation into german agriculture

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Presented in this illustration is an estimation in different production regions of the yield-saving role of plant protection operations in wheat production and also of wheat production losses despite the use of plant protection measures. If chemical plant protection was completely dispensed, world wheat production would equal 413 m. t (ZEIGEN), representing 49.6% of potential yield. Worldwide safeguarding of wheat production through current plant protection measures saves 183 m. t. or 22% of the achievable production. Despite this, the annual harvest losses that are registered reach a volume of 238 m t.; in other words despite plant protection activities 29% of potential wheat production is lost through damage by pathogens, viruses, pests and weed populations. Also clear are distinct differences between the different wheat production regions in the efficiency with which they secure crop performance through use of plant protection products. Furthermore, there are significant differences in yield loss despite modern plant protection activities (ZEIGEN) when comparing western European wheat production and that in the former soviet states. These data are based on many reasons which at this point cannot be further differentiated: a deficit in the official approval processes for modern plant protection products, lack of buying power, bans on the use of some materials, faulty application timing, poorer quality application techniques and, especially, limited training of those involved in application.

Relationship of soil characteristics and *Rhizomania* in Alpullu Sugar Factory sugarbeet growing area

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Soil samples in Edirne, Hayrabolu, Ipsala, Lüleburgaz, Malkara, Muratlı and Uzunköprü regions of Alpullu Sugar Factory were collected from 50 infested fields and 12 healty fields in the depth of 0 to 25 cm. Texture, pH, lime content, organic matter of the soil samples were analyzed and evaluated. Also, soil layers in the soil profiles of 1,5 m depth of were detected in 42 infested and 12 healty fields. Soil samples were taken from each layers of the profiles. The results of texture, structure, pH, lime content, organic matter analysis in these samples and the data of moisture in depth of 0 to 75 cm and 76 to 150 cm in the profile layers were evaluated. All of these results indicated that infection of *Rhizomania* disease was changed according to soil texture, structure, lime content, organic matter and moisture. Soil pH in *Rhizomania* contaminated fields was ranged between 4,3 and 7,0. The disease was detected much more in the fields where soil pH was between 6,0 and 6,9. However, no relationship between the changing of soil pH and infested field or non-infested field was determined.

The reactions of certain processing tomato cultivars to the infections by the agents of some viral and bacterial diseases

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21 tomato cultivars from firms of tomato processing companies and seed production were tested against certain viruses and bacteria in glasshouse conditions and their reactions were noted. In the evaulations, virus contents in samples from the plants was determined by DAS-ELISA while the number of specks (spots) per leaf and the amount of wilted plants were considered for bacterial agents. It was seen that none of cultivars was completely resistant to infection by all of agents under study. However, according to the data from experiments Primatom 712 appeared to be resistant for ToMV; UG 209, TP 0136 and Alexa F1 for CMV and Golf and Alexa F1 for PVY. Furthermore, TP 0099 and Patio for Pst and Super Nema Pride, Primatom 712, UG 209 and TP 0097 for Cmm showed less susceptibility than remaining ones.

Viruses infecting cucurbits in Samsun province

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Viruses causing diseases in cucurbit crops became problem in Samsun in the recent years. To detect cucurbit viruses and find out their distrubition in the region, 523 samples were collected from the fields in eighteen villages of five towns in 1999. It was found that *Cucumber mosaic virus* (CMV), *Zucchini mosaic virus* (ZYMV) and *Watermelon mosaic virus-2* (WMV-2) were the most destructive viruses in cucurbits after analysing the samples by biological and serological methods. WMV-2, ZYMV and CMV were detected in 53.93 %, 38.78 % and 20.60 % of 165 samples tested by DAS-ELISA, respectively. In addition, CMV were alsodetermined in infected plants by reverse transcription-polymerase chain reaction (RT-PCR) using primers specific to the capsid protein gene of CMV.

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Fungi and viruses detected on potatoes grown in Van and its districts

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A number of surveys were performed in the potato grown districts of Van province for detection of fungal and viral pathogens. At the end of the surveys, *Alternaria solani* Ell.&G.Martin, *Alternaria alternata* (Fr.) Keissler, *Curvularia* sp. *Dreschlera* sp., *Fusarium oxysporum* Schl., *Phytophthora infestans* (Mont.) de Bary, *Sclerotium* sp., *Ulocladium* sp., *Verticillium* sp were identified on potatoes. Among them *A. solani* was the most prevailing species with its 37.8 % isolation ratio. The presence of *Potato Virus X* (PVX) and *Potato Virus Y* (PVY) was determined by mechanical inoculations on herbaceous hosts and by ELISA *Potato Leaf Roll Virus* (PLRV) and *Potato Virus A* (PVA) was detected in mix infection with PVX+PVY. A high level of infection was found on potatoes and the presence of PVY, PLRV and PVA were the first report for the region.

Citrus gummy bark disease : 1956-2000

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Citrus gummy bark (CGB) disease was first reported as phloem discoloration of sweet orange by Nour Eldin (1956). It was found on numerous sweet orange varieties, in North African and Near Eastern countries. CGB is common on 15 to 20 years old Washington navel, Valensia and local Dörtyol and Kozan sweet orange varieties in the East Mediterranean region of Turkey. The characteristic symptom of CGB on sweet orange scions is a reddish-brown, gum stained tissue under the bark. This rewiew suggests to give a summary about CGB from 1956-2000.

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Studies on prospects of certain virus diseases on apricot varieties in Malatya

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Apricot is one of the significant crops for table consumption and export in Turkey. As in a lot of plant species, apricot trees are subjected to infection by 20 viruses which affect their productivity in terms of quality and quantity. In Turkey, the studies on virus diseases of apricot trees are limited and.many viruses have been detected symptomatologically in various locations. The present study was performed to determine the virus diseases in the apricot varieties, mentioned in Table 1, in the governmental orchards containing mother plants stock in Malatya. Field inspections for symptom development on the trees were carried out in March to May in 1999. In May, leaf samples were taken from various points (base, middle and top) of shoots in trees. For the determination of the viruses by the DAS-ELISA commercial detection kits of some viruses such as *plum pox virus* (PPV), *apple chlorotic leaf spot virus* (ACLSV) and *prunus necrotic ring spot virus* (PNRSV) were used. The results of DAS-ELISA showed that many individiuals of the varieties called as Pre'cose de Boulbon and Kuru Kabuk were infected by ACLSV in lower concentration while PNRSV determined in the trees belonging to Şam, Tekeler, Çöloğlu and Hasanbey varieties in higher concentrations. In our study according to the results of DAS-ELISA, in the trees of the apricot varieties there was no evidence for the presence of PPV.

Detection and control of viral diseases of apricots in Malatya

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Apricot is one of the most cultivated fruit crop of stone fruits in our country grown mainly in Malatya and apricot grown area in the other provinces. As in the case of other plants apicot is known as a suscebtible crop plant pathogens and pests. It is possible to observe dieback shot-hole, wiltings, cancer wounds and virus like symptoms on plants in the region. The objective of this study is to investigate the problems caused by biotic and abiotics agents and observe economic losess, incidence of disease and pest before and after harvesting and finally to propose an IPM control method.

J. Turk. Phytopath., Vol. 30, No. 3-4, 70, 2001

The investigation on the determination of viruses in the seeds of certain vegetables

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DAS-ELISA were used to detect seed borne viruses in seed samples of pea, pepper, tomato, bean, cucumber, squash, and melon cultivars from several institution dealing with the production and marketing of seeds. The data from experiments showed that the seed samples of pea cultivars were not infected with PEMV and PSBMV as well as seed samples of lettuce cultivars with LMV and TRSV. The rate of infection in seed samples of others were as follows: 84,09 % for CMV and 50 % for ToMV in peppers; 4,65 % for TBRV, 2.32 % for TMV and 72,09 % for ToMV in tomato; 41,17 % for AMV; 23,52 % for BCMV, % 35,29 for SMV and % 11,76 for TBRV in bean; 40,54 % for CGMMV and 29,72 % for CMV in cucumber; 20 % for CMV and 6,66 % for SqMV in squash; 31,25 % for CMV and 6,25 % for TRSV in melon.

Detection of the viroids of grapevine in East Mediterranean Region

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In this study, grapevine viroids of East Mediterranean region were investigated. Survey studies were conducted in grapevine growing areas and approximately 1350 da areas were examined. Stunting, yellow speckle and vein banding were observed as the most common symptoms. 138 samples from grapevine with these symptoms were analyzed with sPAGE. Infection with one or more viroids determined in 43 samples. GYSVd-1, GYSVd–2, HSVd-g viroids and one viroid which has not been identified yet were determined by sPAGE and PCR analyses in grapevine areas at East Mediterranean Region.

FUNGAL DISEASES

Main olive diseases affecting olive trees both in nurseries and olive groves

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Olive is the most important tree crop in the Mediterranean region.Olive cultivation has been spread throughout the Mediterranean basin for thousands of years now and more recently in Australia, China, Japan and North America and currently to South America. Some 750 million trees are grown in approximately 8.5 million hectares, of which about 97 % are in Mediterranean countries (COI, 1991). Currently due to the increasing use of olive oil world wide a remarkable effort by several countries to establish olive groves in southern hemisphere has dramatically increased the demand for disease free plant material

Determination of plant protection problems in tomato growing area in Çanakkale province

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The study was carried out to determine the problems of plant protection on tomato growing areas, in Çanakkale province. This purpose was prepared a farmer inquire that included 28 questionnaires and done an interview to obtain the data with 200 tomato farmers of 42 villages of Çanakkale provincial Capital, Biga, Bayramiç, Ezine Lapseki and Gelibolu district. It was determined that the plant protection of the most problem of tomato growing in Çanakkale and applied many pesticides to control the pests. On the other hand, it was found that the farmers not to be have sufficiently information about the other pest control methods. It was determined that the tomato farmers make use of their experiences to decide to pest control and don't notice their economic threshold. It was observed that the farmers were related to with pesticides seller more than the agriculture organisation; consequently was found to be important the training of the pesticides sellers to solution the plant protection problems in tomato areas.

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Investigations on the determination of the fungal flora of sunflower grown in Turkey both for oil and titbit purposes

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This is the first study related with the sunflower seed pathology in Turkey. 45 seed borne fungus species were determined. Seeds were found highly contaminated with some fungi such as *Alternaria alternata, A. tenuissima, A. zinniae, Aspergillus candidus, A. flavus, A. fumigatus, A. niger, A. parasiticus, A. oxhraceus, A. terreus, A. versicolor, Botrytis cinerea, Cladosporium cladosporoides, C. herbarum, Curvularia intermedia, C. lunata, Drechslera halodes, D. sorokiniana, D. tetramera, Epicoccum purpurescens, Fusarium moniliforme, F. oxysporum, F. semitectum, F. solani, F. subglitinosus, Macrophomina phaseolina, Nigrospora oryzae, Penicillium expansum, P. verrucosum* var. *album, Phoma spp, Rhizopus oyzae, R. stolonifer,* that are said to be found on sunflower seeds and mentioned as seed pathogens in the literature.

Plant pathological researches and plant disease clinical services in Trakya region

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Trakya Region has been the area where modern agricultural education was initiated and the plant pathological researches were conducted on plant diseases at the first time in Turkey. This section of the country has the most important import and export terminals so plant protection and quarantine services are out most importance. More than 40 plant pathological projects have been implemented on diseases of sunflower, wheat, grapevine, rice, fruit tree, maize, vegetables, onion, pot and cut flowers and ornamental plants in agricultural institutions and in the Department of Plant Protection, Tekirdağ Faculty of Agriculture, Trakya University since 1940. As a result of these investigations 12 viruses, 23 fungal, 2 prokaryotic pathogens and 1 parasitic higher plant species were identified. 55 weeds in sunflower and 104 species of weed in wheat fields were also determined. Plant disease clinical service was initiated in 1948 by Erenköy Plant Protection Institute on 30 well known plant diseases and has been continued in the Department of Plant Protection. So far 33 plant disease infection cases have been investigated and reported since 1995. Department of Plant Protection has become unique reference institution in the view of growers and private enterprices.

A general view from the studies regarding to forecasting and early warning of plant diseases which were conducted in the Black-sea region conditions of Turkey up to now

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Studies regarding to forecasting and early warning of plant diseases were started in 1982 year at the Plant Protection Research Institute in Samsun province in the Black-Sea Region of Turkey. First study was conducted on the apple scab (*Venturia inaequalis* (Che.) Wint) disease, second study was on cherry leaf spot (*Blumeriella jaapii* Rehm. Von Arx.) and the latest one was on the tomato late blight (*Phytophthora infestans* Mont. de Bary). As a result of the apple scab disease studies, more effective control was obtained from the applications (average 4 times) done according to the studies based on forecasting and warning realized by observing the fungus biology, phenological stages of the trees and infection conditions than the applications (average 6 times) done according to "Plant Protection Technical Instructions". So it was concluded that chemical applications could be minimized through the forecasting and warning system. Number of chemical application against cherry leaf spot according to forecasting and early warning system based on infection periods was average 5, whereas it was 6 according to "Plant Protection Technical Instructions" based on phenological-biological stages and effectiveness period of the chemicals. Evaluation results were satisfactory for both program. So it was concluded that one less chemical application was enough to control cherry leaf spot through the forecasting and warning system compared to "Plant Protection Technical Instructions". As a result of the experiments it was concluded that with the tested method of early warning tomato late blight could be forecasted 7-15 days before it was seen. The same warning system might be valid for secondary infections as well. And this method could be applied successfully for the field-grown and furrow or drip-irrigated tomatoes under the Black-Sea Region conditions. Also, application number of chemicals against the disease might be decreased from 15 to 0 by this method when compared to "Plant Protection Technical Instructions" and conventional practices of the farmers.

Research on incidency, causal agents and prevention possibilities of damping-off disease in Söke, Aydın

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Cotton which is one of most important industrial and commercial agricultural products of Turkey has extensive production area for years in Aydın-Söke area. In this area damping-off disease of cotton is one of the important diseases of the crop. In this study, case of damping off disease in cotton production area of Söke has been observed by the surveys performed in the area. The determination of causal agents of the disease and control means have been studied under practical conditions.

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Determination relationship between cotton sowing times and wilt disease caused by *Verticilluim dahliae* Kleb. and its effect on yield

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The study was carried out to determine the relationship between cotton sowing times and wilt disease caused by V. dahliae and its effect on yield in Diyarbakır (Bismil) in 1998-1999. Nazilli 87, Delta Pine 50 and Sayar 314 cotton varieties were sown 26 April, 11 May and 26 May in 1998, and 20 April, 5 May and 20 May in 1999. The disease percentages, disease index and the cotton yield were found at the end of vegetation period. The disease percentage and disease index of cotton varieties were found to be different in 1998 and 1999. The highest disease percentage and disease index were recorded at the first sowing time, but the lowest in the third time. The highest yield was obtained at the third sowing time for all cotton varieties. A significant negative correlation was found between cotton yield and disease percentage (r = -0.373) and disease index (r = - 0,337).

Research on prevalence, incidence, disease severity and causative factors in emergency of *Verticillium* wilt

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The objective of this study which was conducted in West Anatolian provinces namely Aydın, Balıkesir, Çanakkale, İzmir, Manisa and Muğla, was to asses the prevalence of *Verticillium* wilt of olive, the incidence and the intensity of disease in olive orchards and to bring out the possible causitive factors of disaese incidence through a farmers' pool. In surveyed area the prevalence of disease was found as 49 % and 60 % in 1998 and 1999 respectively. Disease incidence was 0.8 % in 1998 and 1.0 % in 1999 in olive groves where disaese sypmtoms were observed. The mean disease index was 1,4 in both years in affected trees. When the relation of some factors to disease incidence was examined, the following were verified that: (1) the disease was more intensified in 30 years old or older orchards which had been established by using seedlings as the rootstock, (2) it appeared more recently in olive groves which had been established by grafted nursery trees, (3) the disease could be seen in non-irrigated orchards.

Fungicide resistance of *Penicillium digitatum* Sacc. and *P. italicum* Wehm. isolates from citrus areas in the East Mediterranean region

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Goal of this study was to investigate whether or not isolates of *Penicillium digitatum* and *Penicillium italicum*, which cause decays on citrus fruits during harvesting, transportation, packing, storage and marketing, developed resistance to fungicides, benomly, thiabendazole and imazalil, which are intensively used in our region. It was found that 41.8 % of 42 *P. digitatum* and *P. italicum* isolates collected from packing house, packing house atmosphere, citrus orchards and open market developed resistance to benomyl, thiabendazole and imazalil. From isolates of citrus fruits treated with fungicides in packinghouses, 4 P. digitatum and 2 P. italicum as to ED50 and, also 2 P. digitatum and 1 P. italicum as to ED90 were determined as resistant to each fungicides. When *Penicillium* spp. were isolated from packing house air, 44.6 % of was *P.digitatum*, while 55.4 % was *P.italicum*. ED50 values of *P. digitatum* and *P. italicum* developed resistance to benomyl, thiabendazole and imazalil were 31.1, 22.2 ppm, 14.7, 35.8 ppm and 1.2, 1.4 ppm, respectively. Resistant isolates of *P. digitatum* and *P. italicum* were virulent to mandarin, orange graperfruit at same level like sensitive isolates.

Verticillium wilt in olive trees of Aydın province

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A survey was conducted in order to determine the *Verticillium* wilt incidence in olive orchards which is planted in plain of Aydın province between 1999 and 2000. 13 563 olive trees in 44 orchards were examined. The incidence of *Verticillium* wilt varied from 0.83 to 28.86 % among countries. With a 28.86 % of infected olive trees, İncirliova was the leading town, while the incidence was 24.70 % in Kuyucak, 16.3 % in Buharkent, 13.13 % in Köşk and 9.84 % in Çine. The presence of infected olive cultivars in orchards proved that Yamalak (22.19 %) was the most infected variety, followed by Topan (17.96 %) and Manzanilla 15.19 %. The survey results also indicated that the orchards having the high disease ratio were lands under cotton cultivations. It was also found that 98 % of the orchards were ploughed once in a year and generally irrigated by flooding.

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Detection of *Verticillium dahliae* in olive trees using PCR

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A polymerase chain reaction (PCR) assay has been used for the detection of *Verticillium dahliae* isolates from olive, cotton and strawberry in Aydın Province of Turkey. Using previously designed V. dahliae specific primers Vd-19 5'- CGGT GACATAATACTGAGAG-3') and Vd-22 (5'- GACGATGCGGATTGAACGAA-3') resulted in amplifications of an approximately 580 base pair DNA fragment of all *Verticillium dahliae* isolates tested. However other soil associated fungal species isolated from olive, cotton and strawberry did not give any product in PCR tests. The PCR based assay is considered convenient for routine determination of V. dahliae in plant material from olive orchards and nurseries in Turkey.

The effect of fungicides and biostimulant on the control of gray mold (*Botrytis cinerea* Pers.:fr.) of tomato

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In this study, the objective was to integrate a biostimulant with available chemical control measures, consequently to get comparable efficacy with less chemical. Variations in the activity of specific peroxidase enzymes that likely represent the enhancement of host resistance were analyzed from the leaves of tomato seedlings after individual and combined applications. The efficacy tests of the compounds against the major diseases of tomato were conducted with pot experiments under controlled conditions in the greenhouse. Possible correlations between higher efficacy of the compound in question and increased specific enzyme activity were evaluated with SPSS 8.0 for Windows. The highest control of gray mold (*Botrytis cinerea*) were found in Trichodex + Crop-Set and Switch + Crop-Set treatments with about 84 % and 81 %, respectively, compare to untreated plants. The results were also parellel to increased specific enzyme activities with 65 % and 78 % more produced, respectively. The results have revealed that comparable efficacies with combined applications of biostimulant with suitable fungicides could be likely acceptable and applicable in practice.

Studies on the blight disease occurring at Antalya, Burdur and Denizli anise growing areas

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The causal agent of the blight disease occurring at Antalya, Burdur and Denizli provinces has been identified as *Cercospora malkoffii*. The disease affected all aboveground portions of the plants and, particularly flower cluster infestations caused intense seed infection. Diseased seeds were blackish in colour. In culture media, the development of the causal agent was only possible on PDA after the addition of anise seed extract. The disease was common in all three provinces . The occurrence and intensity of the disease in these three provinces were 93,83 % and 44.86%, respectively.

Biological control possibilities of chestnut blight (*Cryphonectria parasitica* (Murr.) Barr.) hastalığına karşı biyolojik mücadele olanakları

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In this study, 324 isolates were used that were collected from infected chestnut groves by chestnut blight of Aegean, Marmara and Black Sea Regions. Totally 2 v-c groups and 14 hypovirulent isolates were found and that was the first record on the hypovirulence of *C. parasitica* in Turkey. DsRNA isolations were made for 7 of 14 hypovirulent isolates and it has been revealed that they contained transmissible dsRNA. For bio-control studies, the young pot plants were inoculated with virulent and 7 hypovirulent isolates together or alone. Evaluation 5 months after the inoculation of these plants showed the plants inoculated with virulent strain started to die in 1-2 months after inoculation. In the bark of the plants were inoculated with hypovirulent isolates lesions were occurred firstly, then lesion development stopped due to the formation of callus tissue and lesion started to heal. On the plants inoculated with both the virulent and the hypovirulent strains, development of lesion stopped but occurrence of callus tissue was not very clear. These results have showed that the biological control of chestnut blight in Turkey can be carried out by these hypovirulent isolates.

Trifloxystrobin : A new mesostemic fungicide belongs to strobilurin

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BAYER TÜRK Tarım İlaçları 19 Mayıs Cad. No:1 Kat:8 Şişli/İSTANBUL

FLINT (Common name: Trifloxystrobin) has a broad spectrum of activity, giving high levels of control of the most important leaf and fruit spot diseases in pome fruits, grape, vegetables and cereals. Trifloxystrobin is a newly developed mesostemic fungicide, which belongs to the group of strobilurins. A mesostemic fungicide is simply defined as: " A fungicide that has high affinity with the plant surface and is absorbed by the waxy layers of the plant. It re-distributes at the plant surface by superficial vapour movement and re-deposition. It penetrates plant tissue, has translaminar activity but there is little or no transport in the vascular system of the plant". With this unique mode of action FLINT, besides providing excellent disease control, is safe for beneficials, has favourable toxicological and eco-toxicological profile and is compatible with IPM programs.

Studies on the fungal bunch rots in vineyards

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For obtaining fungal causes of the bunch rots, isolations were done especially from vineyards located in Manisa province of Aegean Region during the vegetation periods of 1998, 1999 and 2000. As results of the isolations, *Botrytis cinerea* and *Aspergillus niger* were the most intensive organisms. Other then these fungi, *A. flavus / parasiticus, Penicillium* spp. and *Alternaria* spp. isolates were also obtained quite intensively. According to the in vitro tests, tebuconazole was the most effective fungicide to *B. cinerea, A. niger, A. flavus/parasiticus* and *Alternaria* spp. isolates. Imazalil and ipradion were also highly effective fungicides to *B. cinerea, A. niger* and Alternaria spp. isolates.

The species of *Fusarium* on common vetch in Erzurum and their reaction against to some cultivars of common vetch

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This study was undertaken to determine *Fusarium* species on common vetch grown in Erzurum province during 1997. Our data showed the existence of *Fusarium acuminatum, F. arthrosporioides, F. avenaceum, F. equiseti, F. oxysporum* and *F. solani.* The results of pathogenicity tests performed on the cultivars of Ege Beyazı, Kara Elçi, Menemen 79, Ürem 79 and Vedol common vetch using soil inoculation methods demonstrated the lowest disease severity on Ege Beyazı. The isolates of *F. oxysporum* and *F. acuminatum* caused the highest disease severity on most of the cultivars tested.

Determination of efficacy of salicylic acid on the growth of *Penicillium digitatum* on grapefruit and orange fruits

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Salicylic acid (SA) is naturally occurring compounds that induce variety of defence mechanisms in plants. The effect of SA on the spoilage of orange and grapefruit fruits by *Penicillium digitatum* was evaluated at room temperature. Fruits were immersed in 5, 10, 15 and 30 mM SA solutions for 15 min. then artificially inoculated with pathogens at different times after treatments (subsequently, 1 day or 2 days after SA treatments). Fungal growth on these fruits was observed for 10 days. Results revealed that the effectiveness of the SA was dependent upon concentration and exposure time. Although all concentration of SA reduced decay caused *Penicillium* significantly, 10 mM SA concentration was the most effective and the least phytotoxic in retarding the establishment of the infection and the rate of microbial development. The least pathogen growth was observed on fruits inoculated 2 day after SA treatment. By 7 days after inoculation, disease development was reduced by 75 % on this treatment. Treatment of fruits with 15 and 30 mM SA concentration caused some rind injuries. Beside, 30 mM SA treatment suppressed sporulation on rotten part occurred at site of inoculation. Efficacy of SA on pathogen growth was more pronounced on orange fruits than those observed on grapefruits. Among the control fruits, 33 % of untreated and uninoculated fruits were naturally infected by the pathogen but none of treated fruits with SA was infected.

Determination of important fungal disease agents on pine trees in the Kahramanmaraş regional forests

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This research has been conducted to identify causal agents of drying of branches on pine trees in the Kahramanmaraş regional forests. The investigations revealed severe drying which is more widespread in pine trees in Andırın and Adıyaman regions. Two fungi were isolated from diseased branches and identified as possible causal agents of the drying. *Sphaeropsis sapinea* (Fr.) Dyko & Sutton (*Diplodia pinea* (Desm.) Kickx), causal agent of *Sphaeropsis* shoot-killing of pine, and *Gremmeniella abietina* (Lagerb.) Marelet (*Scleroderris lagerbergii* Gremmen), causal agent of *Scleroderris cancer*, were identified on the basis of fungal structures formed on PDA and diseased tissues. Both diseases occurred most commonly on red pine (*Pinus brutia*) and Iranian pine (*P. elderica*) separately or together. Severity and damage, however, is more striking on *P. elderica*. The most conspicuous symptoms of *S. sapinae* were determined as brown necrotic and stunted shoots tips with brown short needles. Typical symptoms caused by *Gremmeniella abietina* are the dieback of buds and needle browning which developed at the base. In addition to these two fungal agents, brown spot needle blight caused by *Mycosphaerella pini* was also determined on needles of both pine cultivars.

Fungal diseases of raspberry and blackberry in Turkey

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Although the wild forms of raspberry and blackberry could be available in different regions of Turkey, only raspberry through the use of cultural forms began in the surrounding of Bursa Province in 1986. In recent years, blackberry growing has also been developed. Production of raspberry reached to 1621 tons from 3092 da area in Turkey. Bursa is the most important production area that occupies 3052 da by obtaining 1601 tons raspberry. Besides, 24 tons blackberries are produced from 30 da open field in Bursa. Nevertheless, no study has been carried out in Turkey related to the fungi diseases on raspberry and blackberry, up to now. For that reason, surveys have been conducted in Bursa Province and its surrounding during early spring, early summer and early autumn of both 1998 and 2000. Plant samples having disease symptoms were collected. Diseases agents were identified as *Armillaria mellea, Didymella applanata* and *Sphaerotheca macularis* on raspberry, *Kuehneola uredinis* and *Discula* sp. on blackberry. *Phomopsis* sp., *Seimatosporium lichenicola, Microsphaeropsis olivacea* and *Botrytis cinerea* on both blackberry and raspberry. The pathogens except for *A. mellea, B. cinerea, Phomopsis* sp., and *S. macularis* are first records in Turkey.

Research on Fir cancer (*Melampsorella caryophyllacearum* Schröter) in Ilgaz mountain forests

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The existence of Ilgaz Mountain in The Central Anatolia has important effects on the feature of climatic and plant geography. Ilgaz Mountain forests have generally European silver fir (*Abies nordmanniana* ssp. *bornmuelleriana*), Scotch pine (*Pinus sylvestris* L.), Black pine (*Pinus nigra* ssp. *pallasiana*) and Beech (*Fagus orientalis* L.), (*Carpinus* spp.) also Oak (*Quercus* spp.) and Hornbeam (*Carpinus* spp) etc. species Recently, the increasing of abnormal products in European silver fir forests has looked out of people. After being researches; cancer and witches' brooms have been seen in The European silver fir forests of Kastamonu Forest District, Bostan forests and Karadere Forest District, Hamdüzü forests, which was the ratio about % 60-70. Fir cancer (*Melampsorella caryophyllacearum* Schröter) has been seen in all Fir forests and causes the death of young trees and decrease of old trees by heavy snow and wind. The reason of abnormal products especially at the last ten years, it can't do any necessary silvicultural activities and can't take product which is at The Management Plan for Ilgaz Fir forests. At this situation, it has been supposed that being witches' brooms have been increased at old fir trees and have knocked down and broken with heavy snow and wind by the reason of cancer.

Determination of apple phyllosphere micoflora and ınvestigation of their antagonistic effects against (*Venturia inaequalis* (Cke.) Wint.) in Pozantı region

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It was aimed to determine fungal microorganisms and their population dynamics on apple phylloshpere in Pozanti region. 43 different fungus species or isolats have been determined from leaves of Granny Smith, Starkspur Golden and Starkrimson apple species. *Cryptococcus* (white yeast), *Sporobolomyces* (pink yeast), *Alternaria, Penicillium, Cladosporium, Epicoccum, Heterosporium, Papularia* and *Peyronellaea* fungal species have been determined on apple phyllosphere. It it observed that *Aurebasidium* and *Cryptococcus* species are the major part of all fungus population for each of three apple species. Inhibition zones for pathogen microorganisms and saprophyt fungus isolats were measured in dual culture and then effectiveness of antibiotics in liquid culture produced by antagonists against mycelial development of the pathogen have been determined. Best antibiotics for inhibition of mycelial development of *V. inaequalis* are found as *Cryptococcus* (A21), *Sporobolomyces* (A3), *Penicillium* (A8, A9) and *Papularia* (A1) species.

Observations of biyocontrol mechanism of ephyphytic fungi effective on *Penicillium expansum* and *Botrytis cinerea* in SEM

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Against *B. cinerea* and *P. expansum* which cause postharvest diseases on apples, it has been used 123 yeast isolates, which were isolated from the surfaces of the leaf, flower and fruit. 13 yeast isolates, whose percentages of effect were found to be high in the experiments conducted on in-vivo 22°C temperature were selected to determine their effects at +4 °C cold storage temperature. In our study, antibiosis experiments on 123 yeast isolates under in-vitro conditions were made and three different effects were observed. We tried to explain this mechanism in this study where we strongly emphasized hyperparatism, which is one of the antagonism mechanisms. We conducted SEM, studies in this regard also. 4 yeast isolates (35, 75, 85 and 110 isolates) which showed the highest antagonistic activity were used in the SEM experiments. As a result, it was observed that these yeast isolates could not attach to P. expansum hypae and all of them could attached to B. cinerea mycelium.With SEM micro-graph it was observed that pathogen development was hindered through cell degeneration with the attaching to the fibers by the yeast and causing holes in the region.

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Investigation of the effects of solarization and mycorrhizae on to root rot pathogenes and root-knot nematodes in greenhouses

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This study was conducted to determine the effect of Mycorrhizae on to root rot pathogens (*Rhizoctonia solani, Fusarium solani*) and Root-knot nematodes (*Meloidogyne* spp.) in cucumber plants in Yenitaşkent-İçel, in 1999-2001. The effect of applications on root rot disease induce and Root-knot damage on cucumber roots were evaluated.

Investigations on common fungal root diseases of bean in Konya province

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In this study conducted on dry bean growing areas during 1997-1998 to detect the prevalence and pathogens of root rot diseases of bean, survey was carried out in 1 % of growing areas of four county at seedling and bloom-pod periods of dry bean. Average incidences at seedling period were 19.2 and 23.5 % in 1997 and 10.69 and 14.50 % in 1998, respectively. *Rhizoctonia solani* was found to be the most common pathogen in the diseased plants at seedling stage samples whereas *Fusarium solani* and *F. oxysporum* at bloom-pod period.

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Effect of some treatments on decay and quality of Satsuma mandarin in storage conditions

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In this study, the effect of some pre and postharvest treatments on decay development and storage ability of satsuma mandarin, having short storage period, was investigated. Before harvest, CaCl2 (%2; 3 times), 2,4-D (10 ppm), GA3 (10 ppm) and benomyl (60g/100 l were applied on trees. After harvest, fruits were dipped in hot water (54 °C), fungicide (imazalil) and yeast (M1/1) solutions and their combinations for 3 minutes. Fruits belonging to pre and postharvest treatments were stored at 5±1 °C and 85-90 % RH. The decay development was determined and some quality analyses were made on fruit at certain intervals. Generally, less decay percentage was observed because of careful handling of fruits. In preharvest treatments, the decay development was very low on stored fruits immediately and kept at 30 °C (high RH), except control treatments. Development of fungal infections was inhibited by postharvest treatments including imazalil. Alternaria was the main pathogen pathogen causing fruit decays. The effect of some pre and postharvest treatments on fruit quality of satsuma mandarin was examined. The weight loss (%), fruit specific gravity (g/cm^3), peel color (a/b), fruit juice content (%), total soluble solids (%), titratable acidity (g/100ml) and vitamin C (mg/100ml) contents (mg/100ml) of fruits were determined according to generally applied methods after harvest, 1.5 and 3 months of storage at 5±1 °C. The color development was inhibited on fruits belonging to the preharvest treatment of CaCl2+ GA3+2,4-D. On postharvest treatment including yeast, fruit maturity was delayed.

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Effect of calcium and fungicides against some postharvest fungal pathogens of sweet cherry

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The efficiency of Aminoquelant-Ca and some fungicides were tested against postharvest fungal pathogens of sweet cherries(cv. Napolypon B.) that were stored under normal (NA) and modified (MA) atmosphere conditions. As a result of this study, *Botrytis cinerea, Penicillium expansum, Monilinia* sp. and *Rhizopus stolonifer* were determined as the most frequent pathogenic fungi of sweet cherries cv. Napolyon B. The efficiency of Aminoquelant-Ca, iprodione and captan were tested under in vitro and in vivo conditions against *B. cinerea, P. expansum, Monilinia* sp. and *R. stolonifer* and among these, iprodione was found as the most effective treatment. At the end of 60+2 days storage period, percentage of rot of Napolyon B. sweet cherry fruits treated with Iprodione reduced to 13.13 from 21.56, 5.40 from 23.73 under NA conditions and 12.90 from 20.14 and 5.50 from 23.62 under MA conditions in 1998 and 1999, respectively

Determination of the reactions of mutant chickpea lines against *Ascochyta rabiei* (Pass.) Labr.

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Resistance, tolerance and susceptibility of M3 mutant chickpea lines to races 1, 4 and 6 of *Ascochyta rabiei* (Pass.) Labr. were evaluated. The mutant lines of Akçin 91, ILC 482 and Ak 71114 were obtained by exposing them to various doses of irradiation. In the field experiments when M3 mutants were used, the most resistant lines to A. rabiei were obtained from ILC 482 type of chickpeas. The number of resistant plants and their percentages obtained from ILC 482, Ak 71114 and Akçin 91 were 76 (8.47 %), 20 (2.28 %) and 12 (1.22 %) respectively. Plant height, number of seeds per plant, weight of the seeds per plant and the weight of 100 seeds in every catogory of resistant, tolerant and susceptible plants were measured. These values were the highest in resistant plants and the lowest in susceptible plants.

Determination of virus diseases in apple and pear rootstocks

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The purpose of this study is to determine virus, virus-like diseases and phytoplasma-like organisms of apple and pear rootstock and scion varieties producing and chosen to be produced, to select healthy plants. 19 apple and 10 pear varieties were tested with the indicator varieties of Golden Delicious (GD), Lord Lambourne (LL) and Virginia Crab (VC) (for apples), Beurré Bosc (BB), Beurré Hardy (BH), Duyonné du Comice (DC) and Williams (W) (for pears) for the presence of viruses, virus-like diseases and phytoplasma-like organisms of pome fruit trees through field testing between 1992-1997.Some GD and LL indicators grafted with some apple varieties such as Beacon (B 1), Black Stayman (BS 1), Gloster 69 (G69 1), Granny Smith (GS 2, GS 4), Starkrimson (STR 3) and Vista Bella (VIS 4) formed small-sized fruits smilar to that caused by Apple chat fruit pathogen. Depressions formed in the fruit on an indicator grafted with Starking (ST 3) smilar to that cause by Apple green crinkle disease (AGCD). But other simptoms (such as horseshoe wound, rough skin, star crack) were not observed. One Beurré Hardy indicator grafted with Beurré hardy (BH 2) showed light green rings and line patterns on the leaves and greenish rings on the mature fruit smilar to *Pear ring pattern mosaic virus* (PRPMV).Some DC and BB indicators grafted with Beurré bosc (BB 4), Duyonne du Comice. (DC 2) formed dimpling and deformation in the fruits smilar to pear stony pit disease.

Comparison of RNA extraction methods for a reliable detection of *grapevine fanleaf virus* in infected grapevines

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Difficulties extracting high-quality and quantity RNA from grapevine plants infected by viruses are often due to high levels of phenolics, carbonhydrates, or other compounds that bind and/or coprecipitate with RNA. We compare here two methods using silica particle suspension and phenol/chloroform with ethanol precipitation. The first one has been successful to screen about 139 hybrid grapevine plants on which nematodes (*Xiphinema index*) carrying GFLV (*Grapevine fanleaf virus*) were fed. In the method presented, phenolic compounds have been bound to silica particles, then eliminated by washing with buffer solution containing ethanol. It does not require ultracentrifugation. It appears to be widely applicable to particularly difficult plants tissue.

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Determination of responses of different bean cultivars againts races of *Pseudomonas syringae* pv *phaseolicola*, causal agent of halo blight of bean

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Responses of different bean cultivars to nine races of *P. s.* pv. *phaseolicola*, causal agent of halo blight of bean, were determined by applying pod and cotyledon inoculation technique. Race-cultivars specificity was clearly observed on both pods and cotyledons. In susceptible cultivars, virulent races caused water soaked lesion in pods. In leaves, water-soaking lesion surrounded by chlorotic halo and injected area has eventually collapsed. Similar lesions developed in moderately susceptible cultivars but symptoms were associated with more browning around the sites of inoculation. In contrast, the resistant response, produced the characteristic hypersensitive reaction (HR), was characterized as a small discrete browning and tissue collapse at site of inoculation. Among the cultivars, Roma II was found to be susceptible against all bacterial strains except race 1. Şehirali-90, Yunus-90, Göynük-98 and Karacaşehir-90 cultivars were found to be highly resistant against 3, 3, 5, 3 different bacterial strains; Roma II, Şehirali-90, Karacaşehir-90 were found to be moderately susceptible against 1, 2, 3 different bacterial strains respectively. Among the bacterial races, race 6, 8 and 9 were found to be virulent on all bean cultivars tested. Race 3, 4 and 5 were found to be avirulent on all bean cultivars except Roma II.

Studies on the Selective Media for the Isolation of Clavibacter *michiganensis* subsp. *michiganensis*

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Four semi selective agar media (D2an, SCM, mSCM and KBT) were evaluated for the recovery and visible colony forming time of *Clavibacter michiganensis* subsp. *michiganensis* (Cmm) and the selectivity of unidentified bacterial isolates from tomato seed and plants. Recovery of Cmm on D2an, SCM, mSCM and KBT in comparison to Nutrient Dextrose Agar (NDA) medium ranged from 97,3 %, 20,0 %, 107,0 % and 64.0 %, respectively. Percent reduction of unidentified bacteria was 36.4 % on D2an, 27.3 % on SCM, 63.6 % on mSCM and 9.1 % on KBT. Visible colonies of *Cmm* were observed after 3 days on KBT and NDA, 4 days on D2an, 6 days on mSCM and 9 days on SCM medium. The dyes (orange g, alizarin red, berberin sulfate, nile blue, eosine g, thionin, methyle orange, kresol rot and crystal violet) were also tested for inhibitory effect and colony differentiation of Cmm and the unidentified bacteria. Nile blue and crystal violet inhibited *Cmm* at 100 mg/ml concentration but none of the dyes induced pigmentation of *Cmm* colonies. Six isolates of 22 unidentified bacteria showed antagonistic effect on *Cmm*.

Present status of citrus tristeza closterovirus (CTV) disease in East Mediterranean Region of Turkey

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For determination of citrus trees infected with Citrus tristeza colesterovirus in the field and detection of infected orchards in the East Mediterranean Region of Turkey, a survey was programmed in the citrus growing areas (Adana, Hatay, İçel, Osmaniye) in the region. The trees showing characteristic symptoms of CTV in the field conditions were detected by serological method (DAS-ELISA) and biological indexing. Mexican lime, Duncan grapefruit, Madam Vineous sweet orange, sour orange and Eureka lemon seedlings were used as indicator plants for indexing of the virus. According to the survey, total 52 citrus trees show symptoms associated with The trees showing symptoms of Tristeza were found all provinces except Osmaniye. According to seedling indexing, totally 12 plants showed vein-clearing symptom on Mexican lime. But only 9 of those plants were detected as positive for CTV by DAS-ELISA. The sample infected with stubborn was not found by ELISA. The leaves of indicator plants showed symptoms were usually smaller in size and has chlorotic. But vein corking and leaf cupping symptoms on Mexican limes or other indicator plants were not found. The citrus trees infected with CTV were found in orange and mandarin varieties, respectively. However, grapefruit and lemon varieties infected with Tristeza were not detected in the East Mediterranean Region of Turkey.

The occurence of *Rhizomania* in sugar beet growing areas of Kastamonu Sugar Factory

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The presence of *Rhizomania* (beet necrotic yellow vein virus) disease was investigated in sugar beet production areas of Kastamonu Sugar Factory (Center of Factory, Araç, Daday, Devrekani, Center of Kastamonu, Taşköprü, Tosya-Kastamonu, Ilgaz-Çankırı and Boyabat-Sinop). Sugar beet root samples collected from the fields showing simptoms of the disease were tested by DAS-Elisa. In 1994, 1995 and 1996, the areas of 8.312, 6.921 and 7.565 da were surveyed, respectively. Based on the results, it was found that the ratio of the area infected with the disease was 69.21 %, 33.12 % and 56.80 % in 1994, 1995 and 1996, respectively.

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Detection of the spread rate of CCD disease on new citrus plantings and citrus nurseries in İçel

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A new disease which named *Citrus Chlorotic Dwarf* (CCD) was investigated for natural spread in citrus orchards especially İçel city at East Mediterranean Region. 11 citrus orchards were totally searched and 8 orchards were found infected with this disease although 3 orchards were seem to be healty. 7.415 citrus trees were searched and 583 citrus trees were found to be infected. High infection rate detected on Satsuma orchards with 56.18 %. In citrus nurseries, 11 nurseries were detected and 10 nurseries were found infected with CCD disease.

Occurence of bacterial spot (*Xanthomonas axonopodis* pv. *vesicatoria*) on pepper in Çukurova region and researchs on its control

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Xanthomonas axonopodis pv. *vesicatoria* was isolated to infected pepper plants from Adana (Karaisalı ve Ceyhan) and Osmaniye provinces. The pathogen was detected from pepper seeds. Effect of some seed treatments including several degree of hot water, NaOCl, HCl, cupric asetat, 8-hydroxyquinoline, bronopol (Bronotak, Agroevo) and streptomicin on bacterial spot caused by *Xanthomonas axonopodis* pv. *vesicatoria* on pepper seeds were investigated. Effect of these treatments on seed germination were also determined.

Determination of *grapevines leaf roll virus* (GLRV 1+3) distribution by season and plant organs in Hatay using ELISA

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Distribution of *grapevines leaf roll virus* (GLRV 1 and GLRV 3) were determined in grapevines of Hatay province according to phenological stages and plant organs by ELISA during the period of 1999-2000. August, September, and October were determined to be the most suitable periods to detect the virus whereas root, major and young leaves, unriped berries, ripe fruit, and skin tissue were determined to be the most suitable organs. The virus that is in dormant cycle was only determined in skin tissue, however, during the period of spring season it is determined in flower cluster.

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Determination of the incidence of *cucumber mosaic virus* (CMV) infection in the field in Tekirdağ province

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Studies have been to reveal status of grapevine virus diseases that negatively effect grapevine production. A research was carried out to determine occurrence and spatial distribution of CMV in the grapevines. Totally 592 individual plants of Yapıncak variety were evaluated by ELISA and 25 of total plants were found infected by CMV (4,22 %). Mosaic like yellowing, vein clearing on the leaves, relatively reduced rachis and grapes were observed on infected plants. Spreading of the virus in the grapevines looks like by infected vegetative progation material. No vector of the virus has been observed in grapevine in detected plots.

Determination the incidence of PNRSV and ApMV rose viruses in rose by ELISA in the Eastern Mediterranean region

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The incidence of *Prunus necrotic ringspot virus* (PNRSV) and *Apple mosaic virus* (ApMV) on cut roses were investigated by serological techniques in Eastern Mediterranean Region (Adana and İçel Province). Greenhouses occupying 45 da were visited and inspected. PNRSV infected individuals were detected by ELISA among the widely grown varieties Athena, Pareo, Tineke, Vega, Sonia, Helmuth Smith, Dallas, Osiana, Jakaranta, Starlight and Madellon. No ApMV infection was detected among the tested rose samples.

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The effect of soil solarization on green onion and spinac yield and on purslane (*Portulaca oleracea* L.) in Diyarbakır conditions

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This study was carried out to determine the effect of higher soil temperature in two different soil depth, 5 and 20 cm effect of solarization on yield of green onion and spinach, also on population of *Portulaca oleracea* L. in Diyarbakır conditions between 13 August-14 September 1999. The highest soil temperature was measured at 5 cm soil depth at the front irrigated plot and add irrigated plot as 54.5 and 51.5 oC respectively. The effect of solarization on yield of green onion and spinach were determined important as % 32.62 and % 19.90. Four weeks solarization had decreased % 61.11 population of *Portulaca oleracea* L., and this decreasing was as much as 3.87 times with respect to control.

TELDOR SC 500 – The first version of a new chemical group

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BAYER TÜRK Tarım İlaçları 19 Mayıs Cad. No: 1 Kat: 8 Şişli / İSTANBUL

TELDOR SC 500 (common name: Fenhexamid) is a protective specific fungicide which belongs to the newly discovered chemical group of hydroxyanilides. As a result of its novel mode of action, fenhexamid shows no cros-resistance to fungicides of other chemical groups. It has excellent long-term activity against Botrytis on grapes, berries, vegetables, legumes and ornamentals and also gives very good control of *Monilinia* spp. infections in stone fruits and considerably reduces *Sclerotinia sclerotiorum* infections in vegetables. Teldor is non-toxic to honey bees, bumble-bees and other beneficials and is thus idealy suited for IPM programes.

Studies to determine the infection rates, disease severity and the agents of fungal diseases causing economic losses in the spinach fields of Eskişehir and Ankara

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In this study, infection ratio of plants and disease severity of downy mildew (*Peronospora farinosa* f.sp. spinaciae), leaf spot diseases (*Cladosporium variabile*) and root rot and damping of diseases (*Rhizoctonia solani, Fusarium solani, Fusarium oxysporum, Fusarium equiseti, Fusarium heterosporum, Fusarium lateritium, Fusarium moniliforme, Curvularia clavata, Alternaria alternata, Drechslera sorokiniana*) were determined in commercial spinach fields in Ankara and Eskişehir provinces from 1997 to 1998.

Preferences of agrochemical usage of greenhouse farmers in Antalya region and manners of agrochemical markets in this matter

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As a result of questionnaire study which was conducted on Agrochemical markets and farmers, it was found that most problem were nematode (17.89 %), downy mildew (12.63 %) and gray mold (12.63 %) in Antalya region. Dithiocarbamate fungicides and copper products against *Alternaria solani* and dicarboxamide compounds against *Botrytis cinerea* are used commonly compared to other ones. Popular agrochemicals which were known by farmers are mancozeb, maneb, methamidophos, dichlorvos, glyphosate isopropylamine salt and methyl bromide. In addition, results showed that the agrochemical markets recommended to the farmers inconvenient pesticides against some diseases and they prefer the chemical control as primary way to control plant diseases to other control measures.

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Investigation on the reaction of the some apple varieties against *Gymnosporangium confusum* Plowr.

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This study was carried out so as to examine their response or some apple varieties against *Gymnosporangium confusum* in Isparta (Eğirdir), Burdur (Merkez-Bozlar) between 1994 and 1997. Because of the disease on apple trees inoculated at Eğirdir Horticulture Research Institute orchard was not occurred, the evaluation was not done in 1995. The disease was not uniform owing to non uniform of nursery adaptation and this of shoot occurring, although the disease was determined on the leaves of shoots by observing at nurseries of Bozlar in 1996. Therefore, it was concluded that the evaluation was not suitable. Since the suitable conditions occurred by natural inoculation in 1997, the counting and evaluation were done. According to the obtained results, although the symptoms on Mutsu and Hüryemez has been observed the damage has not been important, whereas the damage has been important on Staymeret, Staring Delicious, Demirelma, Starkrimson Delicious. The casual agent was confirmed by J.A. Parmelee as *Gymnosporangium confusum*.

The study of the reactions of wheat loose smut (*Ustilago nuda tritici* Schaffn.) on some varieties and lines in Eskişehir province

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In this study, which was carried out in 1992-1993 in Eskişehir, some observations were made on the biology of loose smut of wheat [*Ustilago nuda tritici* (Schaffn.)] and reactions were determined on 49 varieties and lines of wheat. At the end of the inoculation work which were done before and after the pollination of varieties and lines of wheat, it was fonud that wheat is more susceptible to loose smut before pollination. The wheat grains inoculated with spores of loose smut were planted early and late and it was seen that the highest infection rate came out the early seeding. Reactions of 49 varieties and lines of wheat against loose smut were determined. Of these, "Es91/ SBVD2 17, Es90/1, Es91/SBVD2 23, Es91/ MAKBVD2, Es91/SBVD2 8, Es84-16, Es91/SBVD1 21, Es91/SBVD1 22", common and durum wheat lines and " Bolal 2973, Hybrid13, 4-11, Kıraç-66, Sertak, Atay-85, Ç-1252" common and durum wheat varieties, showed a definite resistance in both early and late seeding.

Fungal pathogens causing root and crown rots on cabbage grown in pasinler plain of Erzurum

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The objective of this study was to determine fungal agents causing root and crown rots of cabbage grown in approximately 50 % of production area in Pasinler, Erzurum during 1999. The results of the study showed the presence of *Fusarium culmorum, F. equiseti, F. flocciferum, F. oxysporum, F. solani, F. solani* var. *martii* f.2 and *Rhizoctonia solani* anastomosis groups (AG)-2 type 1 and AG-4. The pathogenicity tests performed on the İri Baş cabbage indicated that R. solani (AG-4) caused death of all of the plants inoculated. However, the species of *F. culmorum, F. solani* and *R. solani* (AG-2 type 1) caused severe lesions on the root and crown of cabbage.

The effect of salicylic acid and acetylsalicylic acid on the chickpea root pathogens in vitro

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The effect of different doses (0.5, 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 and 16 mM) of salicylic acid (SA) and acetylsalicylic acid (ASA) on mycelial growth of wilt and root rot pathogens (*Fusarium oxysporum, F. solani, F. acuminatum, F. moniliforme, F. sambucinum, F. equiseti, Cylindrocarpon tonkinense* and *Rhizoctonia solani*)'in chickpea (*Cicer arietinum* L) were investigated. Low doses (0.5,1 and 2 mM) of both SA and ASA were not found effective against all these pathogens. The growth of *Fusarium oxysporum, F. solani, F. equiseti* and *F. sambucinum* on PDA was inhibited rate of 100 % by 6 mM dose of SA and *R. solani, C. tonkinense, F.moniliforme* and *F. acuminatum by 4, 7, 8 and 13 mM, respectively.The mycelial growth of Fusarium oxysporum, F. solani* and *C. tonkinense* on PDA plates including 13 mM ASA was inhibited rate of 100 %, *R. solani* and *F. equiseti* by 10 mM, *F. moniliforme* and *F. sambucinum* by 12 mM, and *F. acuminatum* by 16 mM.

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Effects of some fungicides on prevention of fungal contaminations in vitro propagation of kiwifruit

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In this study, firstly, the fungi genera were determined that is caused fungal contaminations during in vitro propagation of kiwifruit and than the effects of mancozeb, chlorothalonil and iprodione on prevention of the fungal contaminations were carried out. The most commonly identified fungi for 2000 and 2001 years were *Alternaria* spp. (52 % and 50 %), *Fusarium* spp. (6 % and 10 %) and *Penicillium* spp. (4 % and 5 %), respectively. The fungicides were used in the vineyard pre-taken explants. At the end of the study, the most effective fungicide was chlorothalonil and the fungicide reduced fungal contaminations from 18.2 % to 6.9 % on shoot tip cultures, from 28.0 % to 3.1 % on nodal segment cultures.

Identification of causal agent of some rice diseases and determination of rate of infection in rice growing areas in Trakya (Thrace) region

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In order to determine some rice diseases which reduces yield and quality and caused by plant pathogenic fungi in Thrace Region this study was conducted during the years of 1998 and 1999. Leaf brown spot caused by *Helminthosporium* sp., leaf and glume spots caused by *Alternaria* sp. and head blight caused by *Fusarium* spp. were determined major diseases in rice crop. Root rot pathogens of rice in Trakya Region were determined as; *Fusarium equiseti* (Corda) Sacc., *F. oxysporum* Sclecht agent of black kernel and glume disease. There were no evidence of plant-pathogen relationship between *Hemicola* sp., *Aspergillus* sp. and *Trichothecum roseum* (Pers.) Link ex Gray species of fungi which were isolated from rice and seed samples in Trakya Region. Those species probably were seconder pathogens on rice crop in storage conditions which reduce quallity of yield by decomposition. It is allusive the leaf blight of rice which is the most important diseases on this crop was not determined in Trakya rice growing areas in Turkey.

Determination of fungal diseases of apricot and incidence in Malatya-Elazığ region

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In this study, determination of fungal diseases of apricot and disease incidence were aimed in Malatya and Elazığ provinces. Survey was conducted in 2000 and 225 plantations were surveyed in both provinces. According to the survey results, the fungal disease of apricot were determined as *Cytospora* sp. (*Cytospora* cancer and twig dieback), *Monilia laxa* (brown rot), *Coryneum beijerinckii* (shot hole disease), commonly and Stereum sp. (silver leaf disease), rarely. In all of surveyed areas, it was determined that, the incidence of twig infection of *Cytospora* cancer was up to 90 % with chancing according to the provinces and caused tree death with level of 25 %. The disease incidence of *Monilia laxa* determined as 48.3 %, of leaves infection of *Coryneum beijerinckii* as 28.7 % and of fruit infection of it as 17.7 %. *Stereum* sp. (silver leaf disease) was found in collection parsel of Malatya Provincial Management of Agriculture commonly and on one tree in a plantation surveyed in Akçadağ.

Determination of barley smut races (*Ustilago hordei* (Pers.) Lagerh.) in Mediterrenean Region

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In this project, carried out between 1993-1999, 59 barley smut isolates were collected from barley fields in provinces of the East Mediterranean Region of Turkey, and 27 barley smut races were determined from them. It was determined that 4 of the races obtained from the region were the same with Tapke (1945)'s races while 23 of those were found as new races. Serife barley cultivar was found as resistant to all isolates except race number 18 isolate while Kaya and Suleyman cultivars adopted to the region resistant to all barley smut isolates collected from the region in the determination studies of reaction of cultivars to races obtained from the Mediterranean Region.

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A study on determination of pathotype frequency within barley powdery mildew populations

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In this study, it was aimed to determine the virulence pathotype frequency of powdery mildew (*Erysiphe graminis* f.sp. *hordei*) found on the wild barley, variation as a function of time. Macro pathogen populations were determined by examining the same characteristics. Pathotype frequencies in samples of aerial populations of barley powdery mildew (*Erysiphe graminis* f. sp. *hordei*), which were collected in wild barley populations areas and in successive periods of time, were compered using WIST (Wind Inpact Spore Trap) and trap plant techniques. Pathotype frequency, of powdery mildew changed due to spor collecting time and spor collecting technique. According to the both techniques, the number of pathotype was extremly high in on the sample, but it was found that widespread pathotypes frequency was less than that of the previous one. It was determined that the frequency of widespread pathotypes changed at every spor collecting time. The values of the highest pathotype frequences (8.37%) were shown in Bornova location during the second spor collecting time with the trap plant technique.

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