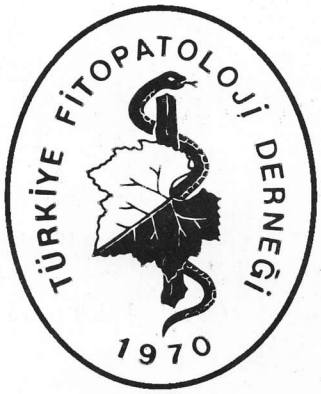


# THE JOURNAL OF TURKISH PHYTOPATHOLOGY

PUBLISHED BY THE TURKISH PHYTOPATHOLOGICAL SOCIETY

Volume :20 Number : 2-3 Sept. 1991

The Journal of Turkish Phytopathology is published by Turkish Phytopathological Society and issued twice or three times a year to from volume. The subscription rate per volume is $ 21.00

Bu derginin basımında TÜBİTAK desteğinden yararlanılmıştır.
Doğruluk Matbaacılık San. ve Tic. Ltd. Şti. 1310 Sokak No : 35
Çankaya - İZMİR - 1991 Tel : 14 31 30 - 13 69 56

# THE JOURNAL OF TURKISH PHYTOPATHOLOGY

TURKISH PHYTOPATHOLOGICAL SOCIETY

VOL. 20 SEPT. 1991 NO. 2-3


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J.Turk. Phytopath., Vol. 20, No. 2-3, 57-68, 1991 ISSN 0378 - 8024

# Studies On The Incidence Of Tobacco Mosaic Virus On Certified Seed Of Tomato, Pepper And Eggplant In Aegean Region*

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## *ABSTRACT*

*Seedlots of tomato, pepper and eggplant received by the Provincial Control Laboratory of İzmir for the purpose of being certified were evaluated for the existance of seed-borne viruses.*

*The extent of contamination of vegetable seedlots by viruses were investigated by biological (indicator plants) and serological means (micro-precipitation and Enzyme Linked Immunosorbent Assay - ELISA). All tests conducted proved of value in detecting contaminated seed, while ELISA was especially found to be useful in detecting viruses in infected seedlots. Accordingly, infested seed rates of Tobacco Mosaic Virus (TMV) was found to be 98.1 %, 18.4 % and 7.4 % for tomato, pepper and eggplant, respectively. The results are discussed in terms of seed control and certification schemes particularly for viruses that occus in low concentration or seldon cause indistinguishable symptoms in the fileds.*

## INTRODUCTION

Vegetables are among the major stable food crops and appear to be particularly well adopted to growth in Aegean Region, which accounts for over 21 % of the Turkish total acreage and nearly 25 % of total output (**).

It is well known that various diseases threaten vegetables are seed-borne viruses. So far, no cultivars resistant to seedborne viruses have yet been developed and no chemical seed treatment gives statisfactory control.

Transmission of viruses by seed is very crucial in the epidemiology of several diseases and there is a definite need for convenient and effective methods for the detection of viruses in seedlots. As TMV virus causes damaging disease wherever susceptible vegetables are grown and because it is transmitted primarily through seed; the use of virus free seed is quite important in controlling the virus (ÇİÇEK and YORGANCI, 1989; RAST, 1972).

Seed transmission in tomato and pepper have been questioned and much discussed blut it is now well established that the virus is carried as contamination

(*) Adopted from a thesis sybmitted and approved from the degree of Doctor of Philosophy of Aegean University.

(**) DIE 1990 Summary of the Agriculture Statisctics.

or infection on or within the seed coat and that the inoculum from these sites may be inoculated into young seedlings during handling, especially transplanting seedlings (RAST, 1979; TAYLOR et al., 1961) and also in eggplant, the site of infection is the seed coat (SHARMA, 1969). This highly infectious virus has an immense host range covering widely different plant families. Losses in tomato crops are often less, but may go up to about 40 %. The symptoms are mottling, leaf distortion, stunting of the plants, dwarfing, local or widespread necrosis, the symptoms varying with strain and host cultivar. TMV is also economically important seedborne virus in tomato, pepper and eggplant in Agean Region of Turkey (ARI, 1956; ERKAN and DELEN, 1982; YILDIZ and ERKAN, 1983; YILMAZ and DAVIS, 1985; YORGANCI, 1975).

Healthy vegetable seeds are produced by applying measures to prevent virus infection and its spread. To strengthen the lproduction of healthy vegetable seeds, in nearly all vegetable growing locations, seed certification is required for commercialization. Certification depends on minumum standards of virus infection, which are reviewed in fields and after harvest.

With the advent of the current era of extensive International exchange of seed materials of diverse genetic backgrounds and intensive cultivation practices there is inevitably an increase in such problems.

Conventional methods used for detection of seed-borne viruses include growing-on tests, indicator-inoculation tests, electron-microscopy and different serological tests and a combination of more than one method often being recommended (PROVVIDENTII, 1980). However low virus concentrations or presence of virus inhibitors in plant extract may hamper the effectiveness of these methods. Such disadventages may be resolved by using the Enzyme-linked Immunosorbent Assay (ELISA). This technique has first been applied to plant viruses by VOLLER et al (1976) and has proved to be creditable and sensible in detecting several viruses in seeds (CLARK and ADAMS, 1977).

This study reported here in was undertaken to identify seed-borne viruses of vegetables, which are generally neglected in Turkey; to ascertain the infection rate and to develop a method as a diagnostic technique in detecting economically important seedborne viruses of vegetables.

## MATERIALS and METHODS

In order to optimise the testing procedures for the detection of viruses in vegetable seeds, it was necessary to obtain a large stock quantity of seeds. The source material of the experiment which were the seeds of eggplant, pepper and tomato consisted of 45.73 % of the total seed come to the Seed Control and Certification Laboratory for testing (Table 1).

Extensive investigations were performed on suitable test plants and serological techniques for detection and differentiation of seed-borne viruses of eggplant, pepper and tomato crops.

The indicator plants choosen for this purpose are listed in Table 2.

**Table 1.** Distribution of vegetable seed samples received by the laboratory on the basis of seed classification.

| Vegetable | Orig. | Basic | Cert. | Contr.1 | Cont.2 | Seed Analy.R. | An.R. | Total | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Number | % |
| Eggplant | – | – | – | – | 37 | 14 | 3 | 54 | 20.07 |
| Pepper | 1 | 8 | – | – | 14 | 8 | 12 | 43 | 15.99 |
| Onion | – | – | – | – | 35 | – | – | 35 | 13.01 |
| Lettuce | – | 5 | 5 | 15 | 5 | 1 | 1 | 32 | 11.90 |
| Tomato | – | 8 | 2 | 3 | – | 12 | 1 | 26 | 9.67 |
| Cucumber | – | 7 | 5 | 3 | 3 | 5 | – | 23 | 8.55 |
| Carrotsb | – | – | 13 | – | – | 1 | – | 14 | 5.20 |
| Water-melon | – | – | – | 5 | – | 3 | – | 8 | 2.97 |
| Spinach | – | – | 7 | – | – | – | – | 7 | 2.60 |
| Squash | – | – | 1 | 2 | – | 3 | – | 6 | 2.23 |
| Parsley | – | – | 5 | – | – | – | – | 5 | 1.86 |
| Cabbage | – | – | – | – | 2 | 1 | – | 3 | 1.12 |
| Leek | – | – | – | – | – | 3 | – | 3 | 1.12 |
| Bean | – | 1 | – | – | – | 1 | 1 | 3 | 1.12 |
| Cauliflower | – | – | – | – | – | 2 | – | 2 | 0.74 |
| Peas | – | – | – | – | 2 | – | – | 2 | 0.74 |
| Gumbo | – | – | – | – | – | 2 | – | 2 | 0.74 |
| Broad bean | – | 1 | – | – | – | – | – | 1 | 0.37 |
| TOTAL | 1 | 30 | 38 | 28 | 98 | 56 | 18 | 269 | 100 |
| % | 0.37 | 11.15 | 14.13 | 10.41 | 36.43 | 20.82 | 6.69 | 100 | |

**Table 2.** Reactions of certain test plants against TMV

| Indicator plants | Pepper | Tomato | Eggplant |
|---|---|---|---|
| **Nicotiana tabacum** L.cv.Samsun | + | + | + |
| **Nicotiana tabacum** L.cv.White Burley | + | + | – |
| **Nicotiana rustica** L. | + | + | + |
| **Nicotiana glutinosa** L. | + | + | + |
| **Nicotiana debneyi** Domin. | + | + | + |
| **Gomphrena globosa** L. | – | – | + |
| **Datura stramonium** L. | + | + | + |

Mechanical inoculation was applied in all tests. Indicator plants were sprayed with 500 mesh carborandum and after inoculation by means of cotton twigs they treated with water. Phosphats buffer (pH 7-7.6) were used for eggplant, pepper and tomato seedlots. Indicator test series were incubated under 3500 to 5000 lux light intensity and 16 hours a day at 18° at 25°C in the incubation room for two to three weeks. Single lesions were transferred on suitable indicator plants bly inoculation to achieve pure isolates of the virus concerned (PHATAK, 1974).

After symptoms had been appeared the inoculated plants were checked for the incidence of infection by micro-precipitation serological test and Enzyme-Linked Immunosorbent Assay (ELISA), which are known to be very reliable and sensitive serological technique (VOLLER et al., 1976).

The antisera to TMV transmitted by tomato, pepper and eggplant seed were diluted as 1:1 with 0.9 % NaCl for micro-precipitation test. A drop of inoculum and same amount of diluted antisera (The original titres o TMV is 1/128) were mixed on a sterile microscope glass and then incubated at 25 °C for an hour in a wet petri dishes. Later on, the glasses were checked if any precipitation occurred under x80 to x100 magnification. The following marks +++, ++ or + were given the labelled glasses depending upon the severity of the precipitation (SLOGTEREN, 1972).

Procedures used for ELISA test were those described by CLARK and ADAMS and CIP (ANONYMOUS, 1986) Microtitre trays (Dnatech laboratories) were instrumented. Results were assessed visually and by measuring absorbance at 410 nm with a Dynatech spectrophotometer and recorded with Star Micronics Gemini Printer. By placing 50 µl of 3M - NaOH in each welle of the plate and maintaining them at +4 °C afterwords, possible more reaction was prevented.

## RESULTS

### Tomato

Depending on the symptom expression of indicator plants inoculated by single lesion inoculation, it was concluded that the virus involved was TMV, which produced local lesions in inoculated leaves in three to five days and systemic symptoms in two weeks. This virus is the most prevalent virus disease of vegetables. Out of 26 tomato seed specimens, 14 were found to be infected with TMV.

The virus was proved to be TMV by fruther serological tests applied. Moreover ELISA Technigue was arisen the fact that eight more samples were also infected with TMV, summing up a total 22 infected samples. ELISA readings obtained for checks and infected samples ranged from 0.01 to OVER. As 26 samples from seedlots tested. 22 were found to be contaminated, seed infection rate of TMV in tomatoes was calculated around 98.10 % (Table 3 and 4).

Taking the origins of seedlots into consideration, it was found out that certified seeds (VF 198 and 68 VF 26) was free from infection. The other classes were all found to be infected with TMV.

### Pepper

Seed infection rate of TMV based on virus detection in seedlots using biological and serological methods was found to be 18.37 % (Table 4 and 5). This figure was quite low compared to 98.10 % found in tomatoes.

### Eggplant

Seed samples of eggplant being the largest portion of seedlots received by the laboratory were also subjected to the same procedures and techniques. The results were interesting in that indicator test results showed only a few local lesions on a few plants. This was explained as the rate of infected seeds in seed samples drawn (150 seeds/sample) was so low that could not evoke clear symptoms. Besides, ELISA did not show clear hydrolisation value, with the exception of positive controls. One may also conclude that seeds were free from viruses.

As a result of three tests, only 7.44 % of the seeds were found to be infected with TMV (Table 6 and 7).

## DISCUSSION

The use of seed is a fundamental for life all over the world. Seed trade constitutes one of the essential national and international activities for the development of societies. Research related to breeding also necessitate seed exchanges. During these exchanges, important pathogens could be introduced and spread in

an area where they were not known before or re-introduced somewhere with subsequent effects. Therefore it is necessary to improve continously the possibilities for checking the peresence of seed-borne pathogens and evaluating levels of infection of seedlots so called certiication standarts. This information is essential to secure the necessary protection and to favour exchanges of high quality seed-lots with the lowest possible levels of infection if not completely free from pathogens. The purpose of legislation and certification schemes is to prevent introduction of alien diseases and decrease the spread of endemic ones.

The results of seedlot tests obtained by the Seed Control and Certification Laboratory indicated that tomato, pepper and eggplant certified seed were contaminated with TMV at percentages of 98.1, 18.4 and 7.4 respectively. It is important to point out that seed specimen investigated in this study were possible mixtures of healty and infected seeds.

Among the detection techniques applied, ELISA was found to be inexpensive, reliable and rapid seed test, which might be of great benefit for Seed Certification and Control particularly for viruses occurring in low concentrations or seldom cause obvious symptoms. The only disadvantage is the large number of steps required to complate the test.

Among the detection techniques applied, ELISA was found to be inexpensive, reliable and rapid seed test which might be of great benefit for seed certification and routine control seed-transmitted viruses that occur in low concentrations or seldom cause obvious symptoms in the field. The only disadvantage is the large number of steps required to complate the test. According to the results from this experiment, field inspection is not good enough and international methods for testing the most serious seed-transmitted viruses of vegetables are needed to use as a routine work at the laboratory.

**Tablo 3.** Distribution of Tomato seed samples infected with TMV.

| Cultivar | No. of samples | | Amount (Kg) in Diff. seed Classes | | | | | Total (Kg) | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | TMV | Basic | Certifi. | Control | Seed Analy.R. | Seed Report | TMV | Healty |
| H.2274 | 11 | 11 | 119 | – | 490 | .65 | – | 1609.25 | 0 |
| ES 58 (28-89) F | 3 | 3 | 49 | – | – | 4.10 | 6.60 | 59.70 | 0 |
| Roma - VF | 3 | 2 | – | – | – | 39.10 | – | 38.40 | 0.7 |
| C-1327 | 1 | 1 | – | – | – | 13.50 | – | 13.40 | 0 |
| Pearson | 1 | 1 | – | – | – | 7.00 | – | 7.00 | 0 |
| C 37 VF | 1 | 1 | – | – | – | 9.00 | – | 9.00 | 0 |
| SC 2121 | 2 | 1 | – | – | – | 33.30 | – | 33.00 | 0.3 |
| Marglobe | 1 | 1 | – | – | – | 15.25 | – | 15.25 | 0 |
| WC 156 | 1 | 1 | – | – | – | 15.00 | – | 15.00 | 0 |
| VF 198 | 1 | 0 | – | 17 | – | – | – | 0. | 17 |
| 68 VF 26 | 1 | 0 | – | 17 | – | – | – | 0. | 17 |
| TOTAL | 26 | 22 | 1168.0 | 34.0 | 490.0 | 136.9 | 6.6 | 1800.5 | 35.0 |
| % | 100 | 84.61 | 63.63 | 1.85 | 26.7 | 7.46 | 0.36 | 98.10 | 1.9 |

**Table 4.** Hydrolisation values and illustration of ELISA test for tomato and pepper seedlots.

MINIREADER II

PLATE ID # II

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | **** | 0.01 | OVER | OVER | 1.53 | OVER | 0.35 | 2.22 | 0.26 | 0.32 | 0.39 | OVER |
| B | **** | 0.46 | 1.81 | OVER | OVER | OVER | 0.71 | 0.84 | 0.29 | 0.93 | 0.34 | OVER |
| C | **** | 1.69 | OVER | 1.60 | OVER | 1.24 | OVER | 0.28 | 0.22 | 0.54 | 0.23 | OVER |
| D | **** | 0.29 | OVER | 0.85 | OVER | OVER | 0.64 | 0.96 | 0.21 | OVER | 0.35 | OVER |
| E | **** | 0.87 | 0.58 | 2.08 | 1.98 | 0.90 | 0.57 | 0.44 | 0.37 | 0.28 | 0.42 | OVER |
| F | **** | 1.69 | 0.30 | OVER | OVER | 1.87 | 0.51 | 0.28 | 0.38 | 0.22 | 0.30 | OVER |
| G | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| H | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |

**** INDICATES UNREAD WELL

**Table 7.** Hydrolisation values and illustration of ELISA test for eggplant seedlots

MINIREADER II

PLATE ID # I

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | **** | 0.01 | 0.12 | 0.09 | 0.11 | 0.13 | 0.12 | 0.11 | 0.12 | 0.00 | 0.03 | **** |
| B | **** | 0.11 | 0.11 | 0.11 | 0.12 | 0.41 | 0.35 | 0.13 | 0.45 | 0.13 | 0.14 | **** |
| C | **** | 0.15 | 0.17 | 0.18 | 0.21 | 0.18 | 0.19 | 0.20 | 0.41 | 0.21 | 0.27 | **** |
| D | **** | 0.16 | 0.18 | 0.18 | 0.22 | 0.20 | 0.20 | 0.20 | 0.23 | 0.30 | OVER | **** |
| E | **** | 0.19 | 0.19 | 0.21 | 0.24 | 0.17 | 0.18 | 0.19 | 0.23 | 0.42 | OVER | **** |
| F | **** | 0.19 | 0.19 | 0.21 | 0.18 | 0.17 | 0.18 | 0.22 | 0.20 | 0.28 | OVER | **** |
| G | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| H | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |

**** INDICATES UNREAD WELL

**Tablo 5.** Distribution of Pepper seed samples infected with TMV.

| Cultivar | No. of samples | | Amount (Kg) in Diff. seed Classes | | | | | Total (Kg) | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | TMV | Orig | Basic | Control | Seed Analy.R. | Seed Report | TMV | Healty |
| Kandil-Stuffed | 9 | 6 | – | – | – | 148.4 | 104.9 | 219.85 | 33.45 |
| 11B-14 | 3 | 3 | – | 116 | – | – | 2.0 | 118.0 | 0 |
| Early C.Wonder | 5 | 1 | – | – | 543.0 | – | – | 180.0 | 463.0 |
| Bağcı Çarl. | 4 | 1 | 15 | 279 | – | 20.0 | – | 15.0 | 299.0 |
| Çarl. 52 | 3 | 1 | – | – | – | – | 53.2 | 45.0 | 8.2 |
| Doru 16 | 1 | 1 | – | – | – | .8 | – | .80 | 0 |
| Sweet 84 | 4 | 0 | – | – | 126.0 | .4 | 8.55 | 0 | 134.95 |
| Oily | 4 | 0 | – | – | 480.0 | – | – | 0 | 480.0 |
| NR-6840 | 3 | 0 | – | – | 442.0 | – | – | 0 | 442.0 |
| Yalova Sweet | 3 | 0 | – | 505 | – | – | – | 0 | 505.0 |
| Aegean hot | 2 | 0 | – | 110 | – | 40.0 | – | 0 | 150. |
| Ilıca 256 | 1 | 0 | – | – | – | – | 1.0 | 0 | 1.0 |
| Yalo Wonder | 1 | 0 | – | – | 54.0 | – | – | 0 | 54.0 |
| TOTAL | 43 | 13.0 | 15.0 | 1010.0 | 1745.0 | 209.6 | 169.65 | 578.65 | 2570.60 |
| % | 100 | 35.13 | .48 | 32.07 | 55.41 | 6.65 | 5.39 | 18.37 | 81.63 |

**Tablo 6.** Distribution of Eggplant seed samples infected with TMV.

| Cultivar | No. of samples | | Amount (Kg) in Diff. seed Classes | | | Total (Kg) | |
|---|---|---|---|---|---|---|---|
| | Total | TMV | Control. | Seed Analy.R. | Seed Report | TMV | Healty |
| Long purple | 12 | 3 | 1100 | 418 | – | 300 | 1218.0 |
| Pala 49 | 2 | 1 | – | 105.60 | – | 100 | 5.6 |
| Aydın Siyahı 55 | 1 | 1 | – | 68.65 | – | 2.65 | 66.0 |
| Black Beauty | 23 | 0 | 2110 | 970.0 | – | 0 | 3080.0 |
| Balıkesir Kemer | 11 | 0 | 335 | 146.1 | 9.0 | 0 | 490.1 |
| Topan 347 | 2 | 0 | – | 35.0 | 8.0 | 0 | 43.0 |
| Halep 18 | 1 | 0 | – | 88.0 | – | 0 | 88.0 |
| Halkapınar 49 | 1 | 0 | – | 19.0 | – | 0 | 19.0 |
| TOTAL | 54 | 5 | 3545 | 1850.35 | 17.0 | 402.65 | 5009.7 |
| % | 100 | 9.26 | 65.50 | 34.19 | .31 | 7.44 | 92.56 |

## ACKNOWLEDGMENTS

We are thankful to Dr. E.F.NORTCOTE of the International Potato Center (CIP) based at Lima, Peru for kindly supply on providing the enzyme-linked antisera and gamma globulin conjugate of TMV.

## ÖZET

EGE BÖLGESİNDE SERTİFİKALI DOMATES, BİBER ve PATLICAN TOHUMLARIYLA TAŞINAN TÜTÜN MOZAYIK VİRÜSÜNÜN TANIMI KONUSUNDAKİ ÇALIŞMALAR

İzmir-İl Kontrol Laboratuvarına sertifika alma amacıyla gelen domates, biber ve patlıcan tohum örneklerinde tohumla taşınan virüslerin varlığı araştırıldı.

Sebze tohumlarıyla bulaşan virüslerin varlığı biyolojik (indikatör bitki) ve serolojik testlerle (mikro-presipitasyon ve ELISA) tanılandı. Uygulanan testler, bulaşık tohumların tesbitind yararlı olmasına rağmen, ELISA testinin hassas olması yönünden daha faydalı olduğu gözlenmiştir.

İndikatör bitki, mikro-presipitasyon ve ELISA testlerine alınan domates, biber ve patlıcan tohum örneklerinin bu çalışmada sırasıyla % 98.1, % 18.4 ve % 7.4 oranında Tütün Mozayık Virüsü (TMV) ile bulaşık oldukları saptanmış ve bu sonuçların Tohumluk Kontrol ve Sertifikasyon işlemlerindeki önemi tartışılmıştır.

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J.Turk. Phytopath., Vol. 20, No. 2-3, 69-80, 1991 ISSN 0378 - 8024

# Fusarium Genus and Fusarium Species Isolated From the Cultivated Plants in Turkey

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## *ABSTRACT*

*In this study, the charactaristics of **Fusarium** genus, the researches which were made with **Fusarium** species in Turkey were reviewed and it was indicated that 31 **Fusarium** species were determinated in 55 plant species.*

## INTRODUCTION

**Fusarium** species from the most widespread fungi groups in nature. They live in several forms on organic materials in every kind of soil from the poles to the equator (Maraite et al., 1973; Kranz et al., 1977).

Some of the species are real parasites. These are determined as the pathogen in the all organs of wild and cultivated plants. The symptoms differ according to the organs and species of the plants. However, the most visible symptoms appear as root rots or wilts.

Some **Fusarium** species as **F.avenaceum, F.culmorum, F.moniliforme, F.equiseti** are able to infect many plants without distinguishing the plant species. Some species are specialized in the genus of, species of, even varieties of the certain plants. For example, **F.coeruleum, F.eumartii** and **F.sambucinum** are specialized in potato, **F.buharicum** in cotton, **F.xyllarioides** in coffee.

Although the **Fusarium** species appear on the several plants organs, the main place where they are present, is the soil. They get into the plants by this way. They can live in soil for many years because they produce the resistant spores in the soil.

They absorb nourishment from the exudes of the roots and of the wounds and the juice of xylem. Carbon sources and some mineral salts provide their main nutrient needs. Because of they dont need more oxygene, they can live in soil 30-40 cm depth. The suitable pH for their growth is 5-7, the optimum temperature is 24-32°C (Beckman et al., 1981).

By decomposing several organic materials into its compounds, they can from many different enzimes, can produce toxins and some hormons which are harmfull to the humans and animals (Chirappa and Zammarano, 1975; Beckman et al., 1981).

Many **Fusarium** species form their sexuel reproduction organs in the specific conditions and according to these characters; for example **F.eumartii, F.javanicum** and **F.solani** take part in **Nectria** genus, **F.acuminatum,**

**F.avenaceum, F.aquiseti, F.graminearum, F.lateritium, F.moniliforme, F. sambucinum, F.stillboides** and **F.xyllarioides** in **Gibberella** genus; **F.decemcellulare** in **Calonectria** genus (Kranz et al., 1977).

The seperation of **Fusarium** species is usually made relatively to the morphological characters. Because of these characters are different according to the time and place and because of some characters appear only in spesific conditions, the classification and determination of this genus is rather difficult and cause different opinions between many scientists.

Many scientists excepted the first classification which had been made by Wollenweber (1916-1935, 1931, 1943) and Reinking (1935), at least the main principles did not change (Kranz et al., 1977).

It was suggested that some researchers from Soviet Union agreed with Wollenweber in the term of the main characters, but they made some differences in the term of grouping and separating to taxonomic categories. However, Synder and Hansen (1940) advanced a rather different and simplified system. Now, this system which had been valid for Synder and in ABD, was adopted by Matuo (1961) in Japon, Messiaen and Cassini (1968) in France. At first, also Gordon (1952) accepted this system which include 9 species, but then he tried to make a better system between Wollenweber's and Synder's system (Kranz et al., 1977). Gerlach (1970) and Booth (1971) defended that 9 species system did not suit to the rules of the classification and determined that it was possible to separate as 50-60 species. Booth (1971) examined **Fusarium** species in 12 different sections as Arachnites, Martiella, Ephisphaeria, Sporotrichiella, Spicarioides, Arthrosporiella, Coccophilum, Lateritium, Liseola, Ellegans, Gibbosum and Discolor. The taxonomy of **Fusarium** genus is still complex.

During the determination of **Fusarium** species, it is also important to know the infection on the host plants, if they are isolated freshly and they are held in light at 25°C, they show their typycal characters in agar medium. Macroscopic and microscopic characters are paid attention to separate from each other the sections and the species in sections.

**Macroscopic characters:** The diameter of the colony; the state of aerial mycelium, the colour of the culture, sclerotial plectenchyma; the type of spore masses.

**Microscopic characters:** The shape of the phialide (Simple or polyphialide), whether the microconidia are present or not, if they are present, how they arise; the shape, width, lenght and septate number of the macroconidia, whether they have thin or thick wall; the shape of their apex cells, they have the foot cells or not; the chlamydospores are present or not and the way of the chlamydospores formation.

The fungi from **Fusarium** genus had been established by several researches in their studies which included the determination of the fungi flora in the soil, seeds and plants and the determination of the pathogen in Turkey and these were researched with different characters.

The results of these researches concerning the cultivated plants wre not well organised and published in different places, were tried to be summarised in this study.

## RESULTS

**Fusarium** species which were isolated from the different organs of the cultivated plants, were given below according to the plant groups and the year order.

1. The **Fusarium** species isolated from the vegetable

Bremer (1948, 1954) informed that he found **Fusarium** sp. in onions, **F.bulbigenum** var. **lycopersici** in tomato, **Fusarium** sp. in eggplants, **F.vasinfectum** in peppers, **Fusarium** sp. in cucumbers, melons, watermelons, carrots and asparagus, **F.vasinfectum** in okra, **F.solani** in beans, **Fusarium** sp. in broad beans, **F.solani** in peas in Turkey.

In tomato; **F.oxysporum, F.equiseti, F.solani** in Çukurova Region (Karahan, 1960); **F.solani** in İzmir, Manisa, Aydın, Denizli, Muğla, Kütahya and Balıkesir; **F.oxysporum** in Uşak and Çanakkale (Özalp, 1962); **F.equiseti** in Ankara (Gürcan, 1968); **F.solani** in Aegean Region, **F.oxysporum** and **F.semitectum** in Uşak, Çanakkale and İzmir (Bornova) (Özalp and Bağcı, 1968); **Fusarium** sp. in Aegean Region (Turhan, 1973); **F.oxysporum, F.solani, F.heterosporum, F.proliferatum, F.equiseti** in Aegean (Öz, 1984); **F.oxysporum, F.semitectum, F.redolens, F.oxysporum** f. sp. **lycopersici, F.longipes, F.moniliforme** in İzmir, **F.oxysporum** f.sp. **lycopersici** in İzmir and Manisa (Filiz, 1985).

In melon; **F.equiseti,** in Ankara (İren and Soran, 1973); **Fusarium** sp. in Ankara (Soran, 1973); **F.oxysporum** f.sp. **melonis** in Aegean Region (Evcil and Yalçın, 1977); **F.oxysporum, F.tabacinum, F.equiseti** in Edirne, **F.solani** in Ankara, **F.culmorum** in Sakarya (Soran, 1979); **F.oxysporum, F.solani, F.equiseti** in Central Anatolia Region (Karahan et al., 1981); **F.oxysporum, F.solani, F.heterosporum, F.culmorum, F.acuminatum, F.proliferatum, F.equiseti** in Aegean Region (Öz, 1984).

In watermelon; **F.oxysporum** in Aegean Region (Qureshi and Yıldız, 1982); **F.oxysporum, F.solani, F.heterosporum, F.avenaceum, F.acuminatum, F.proliferatum, F.equiseti** in Aegean Region (Öz, 1984); **F.oxysporum** in İzmir, Manisa, Aydın (Filiz, 1989).

In cucumber, **F.oxysporum; F.oxysporum** f.sp. **cucumerinum, F.equiseti, F.solani** in Aegean Region (Yıldız and Delen, 1977); **F.oxysporum, F.solani, F.acuminatum, F.equiseti** in Aegean Region (Öz, 1984).

In pepper; **F.oxysporum** in Ankara and Konya (Gürcan, 1968); **Fusarium** sp. in Aegean Region (Turhan, 1973), **F.solani** (Bora, 1976), **Fusarium** sp. in Diyarbakır and Elazığ (Ulukuş and Sağır, 1979), **F.oxysporum** and **F.acuminatum** in Aegean Region (Öz, 1984).

In bean; **F.acuminatum, F.culmorum, F.equiseti, F.oxysporum, F.redolens, F.solani** in Adana and İçel (Soran, 1981), **F.oxysporum, F.solani, F.heterosporum, F.avenaceum, F.acuminatum, F.proliferatum, F.equiseti** in Aegean Region (Öz, 1984).

In cabbage and radish; **F.oxysporum** f.sp. **conglutinans** in Turkey (Karaca, 1963); in cabbage; **F.oxysporum, F.solani, F.heterosporum, F.avenaceum, F.equiseti**; in radish; **F.oxysporum, F.solani, F.avenaceum, F.acuminatum, F.proliferatum, F.equiseti** in Aegean Region (Öz, 1984).

In eggplant; **Fusarium** sp. in Aegean Region (Turhan, 1973); **F.solani** (Bora, 1977); **F.oxysporum, F.solani, F.heterosporum, F.culmorum, F.acuminatum, F.proliferatum, F.equiseti** in Aegean Region (Öz, 1984).

In leek; **Fusarium** sp. (Akdoğan, 1963); **F.oxysporum, F.solani, F.heterosporum, F.avenaceum, F.acuminatum** in Aegean Region (Öz, 1984).

In chickpea; **F.oxysporum, F.acuminatum** in Ankara, Afyon, Burdur, Çorum, Eskişehir and Kütahya (Soran, 1975); **F.oxysporum, F.solani, F.avenaceum, F.acuminatum, F.proliferatum, F.equiseti** in Aegean Region (Öz, 1984); **F.equiseti, F.moniliforme, F.oxysporum, F.sambucinum** in Turkey (Maden, 1985).

In lentil; **F.oxysporum, F.acuminatum, F.solani** and **F.redolens** in Ankara and its surroundings (Soran, 1979); **F.oxysporum, F.sporotrichoides, F.acuminatum** in Aegean Region (Öz, 1984); **F.acuminatum** and **F.oxysporum** in Southeast Anatolia (Sağır, 1988);

In lettuce, **F.oxysporum, F.solani, F.culmorum, F.avenaceum, F.acuminatum, F.equiseti**; in onion, **F.oxysporum, F.solani, F.heterosporum, F.sporotrichioides, F.avenaceum, F.acuminatum, F.proliferatum, F.equiseti**; in garlic, **F.oxysporum, F.solani, F.heterosporum, F.culmorum, F.acuminatum, F.equiseti**; in dill, **F.oxysporum, F.solani, F.avenaceum, F.acuminatum, F.proliferatum, F.equiseti**; in spinach, **F.oxysporum, F.solani, F.heterosporum, F.acuminatum, F.proliferatum, F.equiseti**; in cauliflower, **F.oxysporum, F.solani, F.acuminatum, F.proliferatum, F.semitectum, F.equiseti**; in carrot, **F.oxysporum, F.solani, F.acuminatum, F.semitectum, F.equiseti**; in celery, **F.oxysporum, F.solani, F.proliferatum, F.equiseti**; in parsley, **F.oxysporum, F.solani, F.heterosporum, F.acuminatum, F.equiseti**; in okra, **F.oxysporum, F.solani, F.heterosporum, F.acuminatum, F.proliferatum, F.equiseti**; in rocket, **F.oxysporum, F.solani**; in squash, **F.oxysporum, F.solani, F.culmorum, F.acuminatum, F.proliferatum, F.equiseti**; in artichoke, **F.solani, F.acuminatum,**

**F.equiseti;** in broad bean, **F.oxysporum, F.solani, F.heterosporum, F.sporotrichoides, F.avenaceum, F.acuminatum, F.equiseti;** in peas, **F.oxysporum, F.avenaceum, F.acuminatum, F.proliferatum, F.equiseti;** in cowpea, **F.oxysporum, F.solani, F.acuminatum, F.equiseti;** in beet, **F.oxysporum, F.proliferatum, F.equiseti;** in turnip, **F.oxysporum, F.solani** in Aegean Region (Öz, 1984).

2. The **Fusarium** species isolated from the cereals

Bremer (1948) informed that he found **F.oxysporum, F.equiseti** and **F.culmorum** in wheats, barley, rye and oats, **F.gramineum** in corns in Turkey.

In wheat; **F.avenaceum, F.flocciferum, F.oxysporum, F.equiseti** (Yılmazdemir, 1976); **F.acuminatum, F.equiseti, F.dimerum, F.oxysporum, F.solani** in Ankara (Soran and Damgacı, 1980); **Fusarium** sp. in Central Anatolia (Kınacı, 1984); **Fusarium** sp. in Çukurova Region (Biçici and Çınar, 1988).

In rice; **F.acuminatum, F.concolor, F.culmorum, F.equiseti, F.lateritium, F.moniliforme, F.nivale, F.oxysporum, F.sambucinum, F.semitectum, F.solani** in Aydın, Denizli and İzmir (Fesli, 1975); **F.moniliforme** in Aegean Region (Copçu, 1982).

In corn; **F.moniliforme, F.graminearum, F.culmorum, F.oxysporum** in Samsun (Hatat and Maden, 1988); **F.equiseti, F.graminearum, F.moniliforme** in Edirne and its surroundings (Soran and Asan, 1989).

3. **Fusarium** species isolated from the industrial and ornamental plants

3.1. The industrial plants

Bremer (1948, 1954), informed that he found **F.culmorum** and **F.oxysporum** in sugar beet, **F.solani** in potato, **Fusarium** sp. in sesame, **F.vasinfectum** in cotton, **F.lini** in flax, **Fusarium** sp. in tabacco, anise and tulip, **F.oxysporum** var. **gladioli** in gladiolus, **F.bulbigenum** in narcissus, **Fusarium** sp. in carnation, ornament pea and cactus, **F.oxysporum, F.lateritium** and **F.culmorum** in callistephus, **Fusarium** sp. in chrysanthemum in Turkey.

In cotton; **F.oxysporum** f.sp. **vasinfectum, F.oxysporum, Fusarium sp., F.solani, F.equiseti** and **F.compactum** in İzmir and Manisa (Karaca and Ceylan, 1968); **Fusarium** sp. in Aegean Region (Esentepe et al., 1977).

In soyabean; **Fusarium** spp. in Samsun and Ordu (Ayaydın et al., 1984), **Fusarium** sp. in Çukurova Region (Çınar and Biçici, 1984); **F.moniliforme,**

**F.lateritium** (Esentepe et al., 1985); **F.solani, F.sporotrichoides, F.semitectum, F.lateritium** in Çukurova Region (Çınar et al., 1986); **F.moniliforme, F.solani, F.semitectum, F.oxysporum, F.equiseti, F.graminearum** in Adana, Antalya, Amasya, Bursa, Hatay, İçel and Samsun (Erzurum and İren, 1987).

In potato; **F.coeruleum, F.roseum, F.sulphureum** in Ürgüp and Nevşehir (Karel and Karahan, 1962); **F.sulphureum, F.solani, F.oxysporum, Fusarium** sp., **F.solani** var. **coeruleum, F.culmorum, F.sambucinum** (Gülsoy, 1978); **F.sulphureum** in Bolu **F.oxysporum, F.solani** in Sakarya (Gülsoy, 1982); **F.oxysporum, F.solani, F.proliferatum, F.equiseti** in Aegean Region (Öz, 1984),

In peanuts; **Fusarium** sp. in Aegean Region (Karcılıoğlu et al., 1978).

In tobacco; **Fusarium** sp. in İzmir, Manisa and İzmir (Bora, 1970).

In sesame; **Fusarium** sp. in İzmir, Manisa and Aydın (Karcılıoğlu et al., 1985).

3.2. Ornemental plants

In aster; **Fusarium** sp. in Ankara (Gürcan, 1970).

In carnation; **Fusarium** sp. in İzmir (Sezgin, 1982); **F.culmorum, F.oxysporum, F.equiseti** and **F.solani** in Aegean Region (Sezgin et al., 1984); **F.oxysporum, F.equiseti, F.acuminatum** and **F.culmorum** in İstanbul and its surroundings (Özer and Soran, 1990a).

In gladiolus; **F.oxysporum, F.solani, F.equiseti** in Aegean Region (Sezgin et al., 1984); **F.oxysporum, F.equiseti** in İstanbul and its surroundings (Özer and Soran, 1990 a).

In iris; **Fusarium** sp. in Aegean Region (Sezgin et al., 1984); **Fusarium** sp. in Silivri-Çeltik (Özer and Soran, 1990 b).

In callistephus; **Fusarium** sp. in Aegean Region (Sezgin et al., 1984).

In tulip; **F.oxysporum** in Aegean Region (Sezgin et al., 1984); **F.oxysporum, F.acuminatum, F.equiseti, F.culmorum** in İstanbul and its surroundings (Özer and Soran, 1990 a).

In hyacinth; **F.oxysporum** in İstanbul and its surroundings (Özer and Soran, 1990 a).

In freesia; **Fusarium** sp. in Aegean Region (Sezgin et al., 1984); **F.oxysporum** in İstanbul and its surroundings (Özer and Soran, 1990 a).

In narcissus; **Fusarium** sp. in İstanbul and its surroundings (Özer and Soran, 1990 b).

In pine; **F.oxysporum** in Aegean Region (Vural and Delen, 1988).

4. **Fusarium** species isolated from the fruit trees

Bremer (1954) informed that he found **Fusarium** sp. in apple, **F.orthoceras** in strawberry, **F.lateritium** var. **mori** in mulberry in Turkey.

In banana; **F.oxysporum, F.semitectum, F.solani, F.acuminatum, F.moniliforme** in the Mediterranean Region (Turhan, 1977).

In strawberry; **Fusarium** sp. in the Mediterranean Region (Turan and Dinç, 1981), **Fusarium** sp. in Çukurova Region (Çınar and Pala, 1988).

In pear; **F.acuminatum, F.equiseti, F.sambucinum, F.semitectum, F.xyllarioides** in Ankara (Gürer and Maden, 1988).

5. Other Plants

In tea; **F.acuminatim** in Rize (Gürcan, 1975)

In turfgrass; **Fusarium** spp. in Turkey (Yıldız et al., 1990).

In cumin; **Fusarium** sp. in the Central Anatolia Region (Kocatürk,1988).

## DISCUSSION

When the studies which are made with **Fusarium** species are examined, it is seen that **Fusarium** species are not determined in some plant species. This is due to the difficulty of the species determination. In the identification, the nutrient media are very important. **Fusarium** species can not form every reproduction organ in every nutrient medium. This may create mistakes. To be sure that all their reproduction organs are present or not, the use of the natural nutrient media are suggested. In addition, it is also important whether the isolated species are pathogen or not. Because, **Fusarium** species can be present as saprophyte in soil. To determinate the pathogen species, the selection of the method is the first step. The number of the isolate used also influence the results.

Until today; 31 **Fusarium** species were found in 55 plant species, in Turkey. When the all plants are examined we have the opinion that except a few species, approximately 60 species must be present in Turkey.

## ÖZET

Bu çalışmada Türkiye'de bugüne kadar **Fusarium** türleri ile yapılan çalışmalar incelenmiş ve 53 bitki türünde 31 **Fusarium** türünün saptandığı belirlenmiştir.

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J.Turk. Phytopath., Vol. 20, No. 2-3, 81- , 1991 ISSN 0378 - 8024

# 6th TURKISH PHYTOPATHOLOGICAL CONGRESS

The Turkish Phytopathological Society held its sixth Congress in İzmir - Turkey, between the dates of 7-11 October 1991.

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, 93 scientific papers on several phytopathological topics were presented.

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## Wheat and Barley Disease Pattern and Their Effects in Central Anatolia and Transitional Zone

E. KINACI[8] G. KINACI[33]

Plant constitute 93 percent of the world's diet. Cereal contribute 75 percent of all food, and among cereals wheat is the largest crop.

Wheat is more important to the Turkish economy of any other country in developing world. Wheat and barley are two most widely grown cereals in Turkey and largest part of sowing area lying in "Central Anotolia and transitional zone."

Different type of soils, variation in annual rainfall (286-787 mm) creates different agroecologies where farming methods and growing varieties and disease pattern are also different.

Monitoring the diseases and their affects is necessary for controlling and preventing the production loss due to diseases.

In this research, a survey program conducted between 1986-90 to renew the information about disease pattern and their effects on the growing cultivars and varieties in the region.

Disease pattern was almost like as before 1986. However, leaf blights and root rots had slight increase in frequency and affects.

## The Prevalence and Incidence of Bunt Disease in Wheat Grown Areasin GAP Region and Their Effect On The Crop Yield

M. BİÇİCİ[13] Y.DEDE[13] A.ERKILIÇ[13] S.TOKER[13]

This study was conducted to determine the prevalence and incidence of bunt disease caused by **Tilletia caries** and **T.foetida** and also yield losses causes in 1989 and 1990 in Adıyaman, Diyarbakır Mardin and Şanlıurfa provinces which are located in the GAP region. During two year study period about 120 wheat fields were surveyed and 15 % of them were fonud to be prevalent by the disease. On the fields that were infected by the disease, the ratio of heads with the disease was found to be between 1.1-28.0 % From each of 112 wheat samples 2x100 kernels were removed and placed in separate test tubes. After shaking in 10 ml of distilled water, then spinning at 8000 rom for six minutes, the infestation level of each sample and the number of spores in the kernels was determined by counting under the microscope the number of bunt spores in the sediment. It was found that 78.6 % of 112 samples contained 3.35-4824.84 spore/kernel, 60 wheat samples having an average of 713.5 spore/kernel were grown in plots and the disease was observed in 69.7 % of them. In these plots the number of infected heads per square meter was found to be between 0.33-162.33. It was observed that this level of disease may cause yield losses of 1.1-19.61 %. In addition the disease was found in 87.5 % of untreated samples, however, in samples which were treated with PCNB and some other fungicide the disease level was observed to be 51.8 %. Spore germination tests carried out from treated samples revealed 17.7 % germination rate. In conclusion, this study showed that bunt disease is very common in the region either because of the absence of seed treatment or because of inefficient seed treatment and this may cause 20-28 % yield losses.

# Effect Of Sowing Time on Bunt **(Tilletia)** Infection in Wheat

E. KÜN[3] M. AVCI[3]

This research was carried out in wheat breeding plots of Field Crops Department, Faculty of Agriculture, Ankara. The main objective was to find out the most efficient sowing time of bunt infection nurseries to obtain maximum infection ratios in order to conduct efficient selections during wheat breeding programmes.

For this purpose seeds of 22 wheat genotypes were mixed with bunt (**Tilletia**) spores obtained from Central Anatolia and sown on five different dates. Four fall sowingswere carried out with ten days intervals starting on 27.10.1986. The fifth sowing date as early spring was 31.03.1987. Mature plants were harvested with roots. Infection percentages for each genotype were found by counting the plants showing at least 1 smut ball, and by counting the total plants harvested.

The maximum infection percentage was 47.39 obtained from the II. sowing date. It was followed by III., I., IV. and V. sowing dates as 45.71, 37.79, 24.98 and 2.20 %, respectively. Infection percentages were significantly different due to sowing dates and genotypes. Sowing time x genotype intiractions were also significant.

All individual spikes of plants groupped as "infected" were also screened to look for the existance of any smut ball. Significant and positive correlations were found between the percentages of infected plants and the numbers of infected spike per plant.

It was concluded that the most efficient selection for the response to bunt (**Tilletia**) can be done in Ankara conditions by sowing infection nurseries several weeks later than October, namely on the first half of November. It was also concluded that the selections can be based on either the number of infected plants or the number of infected spikes in each genotype. However, selections depending on the number of infected plants seem more practical.

## The Reactions of Some Commercial Wheat Varieties and Durum Lines Against the Common Bunt Races

M. ÖĞÜT[44]

Common bunt causes damage at the level of average 15-20 % even 70-90 in some fields in lack of chemical control. In order to find out the resistant gene sources, a study has been started from 1987 on in Aegean Region as a part of country wide project.

Studies has being continued with virulence races of **Tilletia foetida** "Wall." Liro and **T.caries** "D.C." Tul. on commercial wheat varieties and durum lines. Throug this paper, resut obtained between the years of 1987-1990 have been evaluated.

In 1987-1988, 7 commercial wheat varieties (durum and bread) in 1988-1989 44 lines and varieties of "second year yield test" materials, in 1989-1990 50 lines of "Durum wheat hybrids" have been tested against common bunt races F-65, F-66, F-67, F-3, F-6 and C-6, C-20.

According to the results obtained so for, the commercial bread and durum varieties; Cumhuriyet 75, Gönen, İzmir 85, Marmara 86, Kaklıç 87, Ege 88, Diyarbakır 81, Dicle 74, Oyça, Gediz 75 were susceptible and Yayla 305 is found as resistant to all of these races. But the others varieties and durum lines have been observed as reactions at several levels.

## Research For Identifiying The Rust Resistance of International Winter Wheat Program Material in Turkey and Other Countries

E. KINACI[8]

Turkey and International Maize and Wheat Improvement Center (CIMMYT) agreed to start a wheat project to serve developing countries depending upon winter and/or facultive wheat.

The project is now serving to 46 countries which are spread out on 5 continents of the world.

One of the major aims is to establish a nursery network providing the free exchange of germplasm and data among winter wheat programs, another one ise to establish a monitoring system for diseases and insects in winter wheat areas. More than 8000 of lines were obtained from 34 countries and tested in Turkey. Selections from those introductions and Turkish winter wheats were included in a nursery so-called "International Winter Wheat Screening Nurserey (IWWSN). This nursery was sent cooperators to evaluate and select for their programs if found valuable. Cooperators was asked to send data back to compile results in a report which goes back to them.

The sake of uniformity, some methodologies were suggested for recording the data including diseases and pests. The results obtained from cooperators have shown that, wheat rusts, particulary stripe and leaf rust wide spread and destructive.

Studies carried on materials indicated that some of these materials have some resistance genes.

## A Study of Powdery Mildew (**Erysiphe graminis** D.C. f. sp **tritici** Marchal) Reaksions in Winter Wheat Varieties Mostly Grown in Thrace and Marmara Regions

H.GÜMÜŞTEKİN[37] H. SORAN[22]

Thirteen winter varieties grown widely in the regions of Marmara and Thrace were tested during 1987-1988 growing season to evaluate the reaction of each varieties to powdery mildew (**Erysiphe graminis** f. sp. **tritici** March.)

The study was set up at two different locations, Edirne and Kırklareli, in a split-split plot design with 4 replications. Five nitrogen Rates (0, 40, 80, 120, 160 kg/ha) were used. Three different scales were imployed to evaluate the reactions of varieties to powdery mildew.

In the combined analysis across locations, significant differences were found among varieties. Bezostaja-1 was found the most susceptible variety where as Çakmak-79, Tunca-79 and Saraybosna were found resistant, respectively, According to their reactions, the other were grouped as either moderately susceptible or moderately resistant.

In Kırklareli, it was found that the development of the disease on the plant was influenced by climate, soil texture and nitrogen levels.

## The Researches on the Determination of the Losses Caused by **Rhynchosporium secalis** the Causal Organism of Barley Leaf Scald in Central Anatolia

E. DAMGACI[43]

In order to determine the severity and distribution of the disease, surveys were made at the stem elogation and milky ripe stages in 1980 and at the milky ripe stage in 1987-1991. In every field examined, infected leaves and their position from the top, severity of disease and percentage of the diseased plants were determined. According to the results of 1980; the disease symptoms were on the 4. and 5. leaves from the top of infected plants, the severity of the disease was 5.60 % and the percentage of the diseased plants was 64.35 % at stem elongation. These disease values were 1.89 % and 49.97 % respetively, and the disease reached upper leaves at the latter stage.

The disease was found at low intensity between 1987-1991, expect 1991. The symptoms reached to second leaves from top, the disease severity was 4.05 % and the percentage of diseased plants was 15.28 % in 1991.

Based on the resultes obtained in this work, it can be concluded that under Centrol Anatolian conditions, **R.secalis** will not be able to cause economically important damage since it is prevalent on the lower at the early stages of plants and looses its severity and prevalence later.

## Studies on the Determination of Reactions of the Some Barley Cultivars and Lines to Covered Smuth of Barley Disease (**Ustilago hordei** "Pres." Lagerh.) in the Mediterranean Region of Turkey.

A. ATAÇ[42] T. YAĞBASANLAR[14]

There is no enough knowledge about phytopathologic problems of barley cultivars and investigations on reactions of their to fungal diseases in Turkey.

The aim of this study is to establies reactions of promising 23 barley varieties and lines to covered smuth of barley disease in mediterranean region in 1988.

Using artificial inoculation method it has been determined that 13 of 23 barley cultivars were resistant to barley covered smuth disease.

## Studies on the Determination of Practical Inoculating Methods with Covered Smut of Barley (**Ustilgo hordei** (Pers.) Lagerh.), and the Effectiveness of Some Systemic and Non Systemic Fungicides at Different Inoculating Ways

E. DAMGACI[43]

In order to research effectiveness of systemic and non-systemic fungicides at different inoculation conditions against covered smut of barley, the studies was carried out in 1980-1983. Seed of Tokak (157/37) barley variety was inoculated by coating the surface with dry spores, the spore suspension and the spore suspansion under partial vacuum and then treated by fungicides.

In the methods of spore suspension and partial vacuum, it was found to occure more infection then dry spore method. It has been concluded that the partial vacuum was the practical and effective in covered smut studies.

The chemicals contained mercury and PCNB were almost uneffective against covered smut, on the other hand, maneb, thiophanate-methyl and carbendazim were found to have change able effectiveness according to the inoculating ways and dosages used. Iprodione couldn't control the disease either at the highest dosage (0.2 %). Fenfuram and carboxin were found as 100 % efective at all of the dosage treated.

## Researches on the Determination of Existence Rates of **Dreschlera graminea** Rab. (Shoem.) and **D.teres** (Sacc.) Shoemoker, on Some Native Barley Cultivars by Different Methods.

B. TUNALI[43] A. GÜRCAN[2]

Nine native barley cultivars have been examined, three different methods to detarmine existence rates of **Dreschlera graminea** and **D. teres** and these three methods were used compared with each other. In this research 200 seeds were used each first and second methods, 100 seeds were for third method. Firstly frozen blatter method was used. In the second method seeds were kept on blatter and later these seeds were scattered on pieces of barley leaves on water agar for 1,5 % in petri dishes. In the end of incubation period these seeds were examined separately under stereo microscope and microscops. At third method the seeds were kept at 6°C during 24 days, were sown to soil in pots and placed at the glass house. The cases of occurrence of disease were observed and contamination rates on the seeds to what extent were reflected to the plants also were found out. Among these barley, cultuvars there were differences in the point of the existence rates of these two agents of diseases. The existence rates of the diseases on the same cultivars were found different according to the methods.

## Der Reaktionstest von Einigen Turkischen und Deutschen Gerstensorten Gegenüber der Künstlichen İnokulation mit **Drechslera sorokiniana** und **D.teres** im Gewaechshaus

H. AKTAŞ[43]

Die Blattflecken- und Fusskrankheiten der Gerste treten fast jedes jahr überall auf Gerstenanbaufleachen der Welt auf und ruft erhebliche Mengen Ertragsverlust hervor. Auch eine sehr wichtige Massnahme ist es einige Resistentsonten finden zu können. Das ist das Untersuchungsziel gevesen. 1986 wurden die Untersuchungen als Versuchsanlage an der TU-München-Weihenstephan in Dürnast Gewaechshaus durchgefuhrt. Hier haben drei Versuch stattgefunden. Für jeden Versuch warden 25 türkische- und 26 deutsche Gerstensorten benutzt. Als Krankheitserreger wurden **Drechslere sorokiniana** (Sacc.) Subram. und Jain (Für die Blattflecken - und Fusskranheiten $S_{96}$- Rasse Türkei, Aktaş und Bora 1981) und **Drechslera teres** (Sacc.) Shoem. (fürnur die Blattfleckenbrankheit T4 - Rasse Türkei, Aktaş, 1986) angewendet.

## Studies on the Effects of Stubble Burning on Certain Soil Borne Pathogens and Their Antagonists in Sowing System of Cereals and Sunflowers

E. ONAN[44] M. ÇİMEN[44] A. KARCILIOĞLU[44]

Sunflowers and cereals are grown by turns in Aegean Region. So, it was studied whether burning stubble affected **Sclerotinia sclerotiorum** and **Macrophomina phaseolina** which are soil borne pathogens of sunflowers. In addition, it was also investigated whether it affected **Trichoderma viride, Myrothecium roridum, Penicillium patulum** and **Aspergillus flavus** which are antagonistic fungi of them.

Burning stubble increased heat little in 5 cm of soil depth, but did not in 20 cm of soil depth. In the plots burning and unburning stubble, it was not found any difference between germination rates of sclerotia of **S.sclerotiorum,** and colony numbers of **M.phaseolina.** In the same way, **T. viride, M. roridum, P.patulum** and **A.flavus** were not affected in 5 cm and 20 cm of soil depth by burning stubble.

The results showed that heat from stubble burning could not be effective in 5 cm and 20 cm of soil depth.

## Integrated Control of Stem Rot Caused by **Sclerotium rolfsii** Sacc. in Peanuts

M. BİÇİCİ[13] Ö. ÇINAR[13] Y. DEDE[13] A. ERKILIÇ[13]

Peanut stem rot disease caused by **Sclerotium rolfsii** Sacc. is one of the most common diseases in Düziçi Osmaniye and Ceyhan where peanuts are commonly grown. A survey was conducted to look at the difference in terms of disease intensity and sclerot contamination in the soil between peanut grown as a first crop and peanut grown as a second crop after winter wheat The number of disease foci in 30 meter-long crop rows was 2.0-5.1 and 2.4-3.4 respectively in first and second crop peanuts. Sclerot contamination in 700 gram of soil was found to be 5.8-32.9 and 2.8-14.7 in number in first and second crops respetively. The effects of tillage, rotation, solarization, fertilization, pesticide application and biological control agents on the disease were also investigated. When the distance between crop rows was 90 and 75 cm and various weed control methods were applied, the numbers of disease foci were determined as 1.5 and 2.0 in 30 m long crop rows, respectively. When the peanut was grown in rotation with wheat in micro plots where sclerots were buried, eight-week solarization killed sclerots by 95.5 %. When peanuts were grown after either wheat or maize or peanut, the number of disease foci in 30 meter long rows was found to be 1.0-1.4 and 2.7, respectively. When urea and calcium ammonium nitrate with the five different pesticides applied, the number of disease foci in 15 meter squale plots was found to be 13.2 and 16.7 respectively. The number of disease foci in the same plots after PCNB and carboxin application was 9.3 and 12.0 respectively which were substantially lower than 21.6 in the control plots. The fertilizer application did not affect the number of sclerot, however, the PCNB application decreased its number by 92.6 % to control in the same experiment, the crop yields was 6.26 kg in the PCNB applied plot and 4.11 kg in the control plot. In terms of biological control methos, under in vitro conditions gram (-) bacteria were found to be effective compared with fungi.

## Effects of Nitrogen and Potassium on Germination of Pathogen in Vitro and Host Behaviour in Sunflower Downy Mildew (**Plasmopara helianthi** Novot.)

E. ONAN[44] E. ONOĞUR[18]

Downy mildew caused by **Plasmopara helianthi** Novot. is one of serious diseases of sunflowers. Nowadays, although there are efficient control methods such as growing resistant varieties against the disease and systemic fungicides applying seed, it is known little knowledge on the role of fertilizers on sunflower behaviour to downy mildew.

In the study, the effects of four N-fertilizers (urea, ammonium nitrate, ammonium sulphate, calcium nitrate) at five different doses (60, 180, 300, 420 and 540 ppm) and the combination with potassium (potassium sulphate-30, 120, 210, 300 and 390 ppm doses) and phosphate (triple super phosphate-40 ppm dose) were investigated on germination of zoosporangia in vitro and sunflower behaviour.

Nutrient elements and their combinations were not efficient on germination of zoosporangia. However there was difference among behaviour of sunflowers which were grown in nutrients and their combinations. When dose of $N\text{-}NO_3^-$ was increased, the disease severity increased; when $N\text{-}NH_4^+$ was increased the disease severity decreased. In the combination of N-fertilizers and potassium sulphate, disease severity also decreased.

## Studies on the Effects of **Helminthosporium papaveris** on on Seed Quantity and Morphine and Oil Ratio of Capsule of Opium Popy

A. KARCILIOĞLU[44] E. ONAN[44]

This study was carried out between the years of 1988 and 1989 in Uşak in order to determine the effects of **Helminthsporium papaveris** on seed and capsule weight, and morphine and oil ratio of capsule of opium poppy.

Diseased and healthy capsules which were the same big picked from the same field and plant in UŞak province. Diseased capbules were classified according to 0-3 scale, and they were send to Bolvadin (Afyon) alkaloid factory.

It was found that **H.papaveris** decreased capsule and seed weight, and morphine and oil ratio of capsule of opium popy.

## The Investigation on the Important Diseases Established on Opium in Afyon Provinces and Their Effectiveness on the Morphine, Oil Contens and the Amount of Seeds in Capsules

S. KOCATÜRK[43] G. TUNCER[43] İ. TOK[36]

In this study withering, mildew, leaf spots, blight and spot simptoms on stem and capsules were estimated in seedling, flowering and capsules periods in poppy cultivation areas of Afyon Provinces in 1988.

**Fusarium** spp. from withering plants. **Alternaria** spp. from spotted leaves and capsules and **Dendryphion** sp. from blighted plants were estimated.

When the capsules were ripened, the samples of heads were picked up according to the 0-3 scale and these were analysed to check up the effect of **Dendryphion papaveris** on morphine, oil contents and the amount of seed. At the end of these analysises, it was found that the increase of the disease amount reduced the amount of seed and its oil content, but it was not so effective on morphine content.

## Rhizosphere Interactions of an Omnivorous Nematode, **Mesodorylaimus lissus** and Some Soil Pathogens

N.N. ERTEKİN[44] C.C. RUSSELL[32]

**Mesodorylaimus lissus** has been accepted as a predacous species like other nematodes in the order Dorylaimida in which it is situated. This nematode was collected from the rhizosphere of wheat in Oklahoma. **M.lissus** exhibited parasitic feeding habit on wheat root hairs and reduced wheat seedling root weight and top weight and seedling emergence rats.

It was found that the primary feeding habit of **M.lissus** was predacous; however, it fed parasitically upon **Pythium irregulara** and **Bipolaris sorokiniana.** It was also observed that this nematode was able to feed upon **Rhizoctonia cerealis** and some Actinomycetes. This omnivorous feeding mode contributes to species perpetuation at a maintenance level.

This study was conducted under laboratory conditions to elucidate the impact of **M.lissus** populations in a soil rhizosphere environment. The effects of **M.lissus** at 250, 500 population levels and its combination with the pathogenic soil fungi **B.sorokiniana** and **P.irregulara** in an attempt to evaluate any rhizosphere interactions which might occur between the potentially pathogenic organisms on the basis of seedling emergence and host root and top biomass production.

This study interpreted that **M.lissus** might delay seedling emergence and biomass production of wheat. The relationship between **M.lissus** and fungi predominantly competitively inhibitory. The only additive relation was found at the combination of **M.lissus** 250 level with **P.irregulara** on the top weight of wheat plants.

## Prevalence of Fungal Diseases of Fodder Crops (Legumes) in Aegean Region

S.ÖZ[44] O.YALÇIN[44]

A survey study has been carried out to find fungal agents, their incidence and distribution of two fodder crops, alfalfa and lathyras in these provinces of Aegean Region as fallows: Aydın, Denizli, İzmir, Manisa, Balıkesir, Çanakkale for two years (1989-1990).

With this work, 213 alfalfa and 74 lathyrus fields were inspected. **Peronospora trifoliorum, Pseudopeziza medicaginis, Phoma medicaginis, Stemphylium botryosum, S.vesicarium, Colletotrichum coccodes** identified over the green foliage of alfalfa at the fields. As contrast, **Peronospora** sp, **Ascochyta pisi, Erysiphe pisi** were established diseases of lathyrus. **Sclerotiorum, Macrophomina phaseoli, Rhizoctonia solani, Fusarium** spp as agents causing root and collar diseases were encountered in 6, 3.1 and 3 alfalfa fields respectively.

## Effects of Temperature and Pathogen Isolate on Laboratory Screening of Soybean for Resistance to **Sclerotinia sclerotiorum**

B.D. NELSON[31] T.C. HELMS[30] İ. KURAL[45]

The effects of temperature and pathogen isolate on laboratory screening of soybean (**Glycine max** L.) for resistance to **Sclerotinia sclerotiorum** were investigated. The screening procedure used excised stems from five-wk-old plants. Temperature and isolate significantly affected the length of stem lesions on 15 and 10 cultivars, respectively. At 15° C lesions were significantly shorter, but there was no difference in lesion length between 20 and 25 C. One of the isolates caused significantly shorter lesions. There were significant differences among cultivars, but there were no temperature x cultivar or isolate x cultivar interactions. Choice of isolate and temperature between 15 and 25 C, therefore, should not affect the relative differences between cultivars when screened for resistance using the excised stem method. Maple Presto, Maple Arrow and Maple Ridge were the most resistant of 19 cultivars evaluated.

## Role of the Inoculum Density on the Resistance of Chickpeas to **Ascochyta rabiei** (Pass.) Labr.

F.S. DOLAR[2] A. GÜRCAN[2]

In this study, role of the inoculum density on the resistance was determined utilizing both detached leaflets and whole plants of two different chickpea cultivars (ILC 629 and 65C830). Fifteen day old plants for each cultivar were inoculated with seven different inoculum concentration (2, 4, 8, 16, 32, 64 and 128x10$^4$ spor/ml) of the race 1 of **A.rabiei.**

At the end of experiments, the relationship between the resistance and inoculum density was determined. The disease severity was increased according to the increase of the inoculum density or it as kept as constant after certain inoculum density. However great differences were observed in response of varieties to same inoculum density. Also determined that inoculum density on the resistances has very important role.

## The Study on the Control of the Foot Rot of Lentil Caused by **Phoma medicaginis** var. **pinodella** in Southeast Anatolia

A. SAĞIR[45] B. GÜRKAN[45] F. TATLI[45]

The study was conducted to determine the reaction of lentil varieties, host range of the fungus and its chemical control. Chemical trials were carried out both in the greenhouse and in the field, but the other experiments were conducted only in the greenhouse. In the experiments three isolates of **P. m.** var. **pinodella,** from lentil, 20 lentil varieties, 12 other legumes and four chemicals and their mixtures as seed dressing (300 g/100 kg seed) were used.

In the greenhouse studies inoculated seeds (previously surface sterilized) were sown in inoculated soil, after sterilization. For the soil inoculation fungus was cultured on lentil medium (800 g lentil; 1000 ml water) at 22°C for 20 days and 250 g inoculum (medium + fungus) was added to 1 m 2. For the seed inoculation, slightly germinated seeds (germination tubes were 3-5 mm) were inoculated by spraying 1-2 x 10 6 spores/ml suspension of fungus which was grown on the PDA. After a sufficent level of disease developed in the plots, plants were uprooted and lesions on the crown were rated on a 0-5 scale.

**P. m.** var. **pinodella** caused disease symptoms on all the lentil varieties. Disease severity indexes of varieties ranged between 0.59 and 2.51 and there were 11 groups according to their susceptibility. Kışlık Pul 11, ILL 4523 and NEL 273 were the least susceptible varieties.

The fungus showed pathogenicity on **Cicer** sp., **C. ariethinum, Lathyrus sativus, Vicia ervillia, V. narbonensis, V. sativa, V. sativa vulgaris, Pisum arvense** but not on **Medicago sativa, Onobrychis sativa, Trifolium** sp. and **V. villosa.** The mean disease severity indexse of susceptible hosts were between 0.64 and 2.74. The pathogen was reisolated from the diseased plants.

In the seed treatment trials the chemicals gave following effectiveness against foot rot on lentil in the greenhouse and in the field, respectively. Captan H 40.80 %, 20.97 %; Pomarsol forte 46.50 %, 27.27 %; Bavistin 58.04 %, 58.74 %; Benlate (300 g) 91.37 %, 67.83 %; Benlate (500 g) 89.08 %, 72.02; Benlate + Captan H 87.35 %, 76.22 %; Benlate + Pomarsol forte 90.80 %, 67.83 % Bavistin + Captan H 81.60 %, 60.13 %; Bavistin + Pomarsol forte 71.83 %, 69.93.

## Cultural and Morphological Features of Anastomosis Groups of **Rhizoctonia solani** Kühn Isolated from Potatoes in Erzurum Region

E. DEMİRCİ[5] M.T. DÖKEN[5]

In this study conducted in Erzurum Region the isolates of **Rhizoctonia solani** Kühn (**Thanatephorus cucumeris** (Frank) Donk) recovered from potatoes were identified as AG-2 type 1, AG-2 type 2, AG-3, AG-4 and AG-5. Although there were some differences among these anastomosis groups from the point of colour and appearance of the cultures, AG-2 type 2 and AG-3 were similar to each other. The highest mean hyphal width was measured in AG-3, whereas Ag-2 type 1, AG-2 type 2 ranked in the second place with their approximately similar values which were fallowed by AG-5 and then AG-4 with is smallest width. The mean sclerotial dimensions of AG-2 type 1, AG-2 type 2, AG-3 were similar and so were AG-4 and AG-5. On the other hand the number of nuclei in each hyphal cell of the isolates of the anastomosis groups examined ranged from 3 to 16 in which the average highest and the lowest number of nuclei were in AG-3 and AG-4 respectively. The daily rate of radial spread on agar were increased up to 25°C in AG-2 type 2, AG-3, AG-4 and AG-5 but no growth was recorded after 20°C in AG-2 type 1.

## Some Properties of Anastomosis Group-3 (AG-3) In **Rhizoctonia solani** Kühn from Potato

G. TUNCER[43] G. ERDİLLER[2]

AG-3 mycelia of **Rhizoctonia solani** isolates obtained from stem, hypocotyl and tuber of potatoes grown in Ankara, Afyon, Bolu, Eskişehir, Niğde, Nevşehir were studied. Mycelium has devoloped dark chocolate brown in PDA, was parsely aerial or generally appressed to the agar surface. Small sclerotia were formed on agar surface, or embedded in agar. A mean hyphal width was 9.14 ± 0.55 (7.55 - 10.18). The nuclei number per vegetatif cell was 6.45 ± 0.12 (4 - 10). They grew most rapidly at 24°C with 12.09 ± 0.83 (9.10 - 17.40) mm/day. No growing was recorded at 32 and 36°C. Isolates were autotrophic for thiamine requirement.

## An Assesment of the Effects of Some Biotic and Abiotic Disease Factors on the Seed Yield of Early Cauliflower Varieties

E. ONOĞUR[18] D. EŞİYOK[19] N. ÇETİNKAYA[18] B. ESER[19]

Some rottings which occur on the curds of early cauliflower varieties grown for seed production cause low seed yield. It was observed that the environmental factors like heavy rain and low temperature, as well as some pathogens, mainly **Alternaria** spp. and **Peronospora parasitica,** could be responsible for these rottings.

This study was carried out with the aim so as to find the effects of cultivation methods and fungicide applications in controlling these rottings. The cultivation methods were the usual growing of the plants in the open field, covering the plants with polyethylene (PE) tunnel and cut-off some lobes in the middle of the curds of open-field plants. The fungicides with the active ingredient propineb or metalaxyl were applied in four different programmes.

It was established that the covering of the plants with PE gave the best result to avoid the negative effects of the withering and so the highest seed yield was obtained from covered plants. The fungicide application particularly at the growth stage before the curd maturation supported the higher seed yield.

## The Effect of Solarization and Methyl-Bromide on the Soilborne Pathogenes in Glasshouse Grown Cucumbers

A. ERKILIÇ[13] A.ÇINAR[13]

Of the soil borne plant pathogens **Pythium** sp, **Sclerotinia sclerotiorum, Verticillium** sp, **Fusarium** sp. and the root knot nematodes, **Melodogine** sp. cause very severe disease in cucumber grown glasshouse in Aydıncık (İçel) provience. Three different applications used to reduce the diseases caused by the soilborne pathogens were methyl-bromide solarization (80 g/m2) and solarization plus methyl bromide (20 g/m2).

It was determined that total saprophytic fungi and bacteria were reduced after the applications explained above 58.8, 42.8 and 63.0 percent, and 42.0, 81.0 and 73.0 respectively. On the other hand, the population of the actinomycetes increased 41.3 percent as a result of solarization.

These soil-borne pathogens caused the disease 33.83 percent in control plot, and 20.74, 19.26 and 19.88 in methyl-bromide, solarization and methylbromide plus solarization respectively. Besides, the effect of the applications on the incidence of the disease were 38.69, 43.06 and 41.23 percent.

The results showed that the effects of the saprophytic microflora and the applications of solarization and methyl bromide were similar on the soil-borne pathogens.

## Studies on the Determination of Fusarium Wilt Races and the Reactions of Watermelon Cultivars to Pathogen

N. FİLİZ[16] G. TURHAN[18]

Wilt caused by **Fusarium oxysporum** f. sp. **niveum** has been studied on watermelon. According to survey carried out in Izmir, Manisa and Aydın provinces for two years, a total of 103 **F.oxy.** f. sp. **niveum** isolates were obtained from 123 fields. Isolates showed a variation in pathogenicty between 4-96 %. Three pathogenic races namely "0", "1" and "2" were identified. Klondike, Crimson Sweet, Fairfax were moderately resistant to race "0" Charleston Gray 133 were highly resistant. Siyah Alaca, Halep Karası, an cultivar from Akşehir, Tabata Kanro and Shinyamato 3 were slightly resistant to race. "0" Crimson Sweet, Charleston Gray 133 were moderately resistant; Fairfax, Shinyamato 3, Tabata Kanro, Siyah Alaca were slightly resistant to race "1". None of them were resistant to race "2".

## Investigations on the Collapse of Melon Plants Caused by Some Soilborne Fungi in the Aegean Region of Turkey

H. TEZCAN[41] M. YILDIZ[18]

The present study was conducted in the provinces of Izmir and Manisa during 1988-1990 and the following results were obtained.

According to field survey results performed in fifteen days before harvest season, the mean incidence of the disease was estimated to be 39 %, 35 % and 17 % for years 1988, 1989 and 1990, respectively. The following fungi were the most commonly isolated from the roots of diseased melon plants in the years of 1988, 1989 and 1990, respectively. **Fusarium** spp. (67.6 %, 59.5 % and 44.7 %), **Macrophomina phaseolina** (25.8 %, 21.3 % and 50.4 %), **M.phaseolina + Fusarium** spp. (8.2 %, 2.9 % and 13.6 %), **Rhizoctonia solani** (0.0 %, 4.0 % and 0.2 %), **Pythium** spp. (0.9 %, 0.0 % and 1.1 %), **Alternaria** spp. (1.3 %, 0.4 % and 0.0 %). In pathogenicity tests with **M.phaseolina** and **Fusarium** spp., all of tested 19 **M.phaseolina** isolates were found to be pathogenic for melon, although only seven **Fusarium** spp. isolates of tested 40 items were observed to be pathogenic.

In field trials, the mean incidence of the collapse were greater in plots inoculated with **F.oxysporum** and **M.phaseolina** than with either alone and the effect of irrigation on the collapse was found to be unsignificant.

The effect of planting date on the incidence of the collapse was also found to be unsignificant. However, later planting date have caused less the occurrenge of damping-off.

## Weeds in Cotton Fields and Their Distrubitions and Densities in Southeast Anatolia

A. ULUDAĞ[45] M. KATKAT[45]

In this study, weeds in cotton fields in Southeast Anatolia and their distribution and densities were determined in two different seasons using split sampling method in 1989 and 1990. Weed densities in Diyarbakır and Siirt provinces were 10.92 and 61.03 per m2, respectively, in surveys which were done before first hoeing. In this season 74 species which blong to 25 families were determined. **Amaranthus** spp., **Convolvulus arvensis, Cynodon dactylon, Solanum nigrum, Sorghum halepense** and **Xanthium strumarium** were dense and wide spread. Weed densities in surveys which were carried out after last hoeling were calculated as 6.89 in Şanlıurfa, 9.44 in Mardin, 11.02 in Diyarbakır, 12.49 in Siirt, 13.62 in Adıyaman. In this season, 64 species which blong to 23 families were found. **C.arvensis, C.dactylon, Portulaca oleracea** and **S.halepense** were the most dense and wide spread species.

## Determination and Distribution of the Species of Blackgrass (**Alopecurus** spp.), Canarygrass (**Phalaris** spp.) and Wild Barley (**Hordeum** spp.) in Wheat Growing Area in Çukurova Region.

Ö. BOZ[13] F.N. UYGUR[13] İ. KADIOĞLU[42]

The grass weeds in **Poaceae** family are the most difficult weeds to control in wheat growing area in Çukurova Region.

The objective of study is to identifiy of **Phalaris, Alopecurus** and **Hordeum** species and determine their distribution in Çukurova Region.

Certain percent of total field was sampled to determine frequencies and average density of these species in the infested fields.

**Phalaris, Alopecurus** and **Hordeum** were found to be most common weed species respectively in weed growing area.

Distribution ratio and morphological properties of these species were examined in detail.

## Bioecologic Properties of Roots of Russian Knapweed (**Acroptilon repens** (L.) (DC.), a Problem Weed of Wheat Fields

S. SÖZERİ[2] G. ERDİLLER[2]

The most predominant properties of the Russian knapweed (**Acroptilon repens**) is it's root that spread far in vertical or lateral in the soil and bitter taste of its leaves coming from toxic substance.

It is one of the most important weed of wheat fields, as well as orher cultivations and found to infest the wheat fields in all counties of Ankara province with a density of about 0,38-8,46 plant / sq.m. Optimum temperature for root germination is obtained at -8°C, Light has found to have adverse effect on root germination. A slight apical dominance in root has determined, although 0,5 cm root parts could germinated.

Control studies are still going on widely, chemicals in Russia, biologic in Canada as well as in other countries. Very few studies have been carried out in Türkiye relating its control measures.

## Researches on the Effect of Soil Depth on the Germınatıon of Some Weed Seeds

B. TAŞTAN[43] A. ERÇİŞ[10] A. YILDIRIM[43]

Seed of 10 important weeds of wheat fields of Central Anatolia Region of Turkey were collected in their mature stage on 13.7.1989, and buried in 2, 5, 10, 15, 20 and 25 cm depth of pots in three replicates as each contain 100 seed. Pots were buried in fields and necessary observations and counting for the emerging seedlings were made for 20 months. Following noting, emerged seedlings were pulled out of the medium to prevent repeating countings.

No emerge was found to happen from the depths of 20 and 25 cm. The seedling emerge rates (%) for 2, 5, 10 and 15 cm. are as follows for the species, respectively.

| | |
|---|---|
| **Lolium temulentum** | : 92, 66, 45, 2 |
| **Aegilops cylindrica** | : 91, 100, 12, 0 |
| **Alopecurus myosuroides** | : 16, 6, 0, 0 |
| **Weidemania orientalis** | : 21, 4, 0, 0 |
| **Centaurea depressa** | : 14, 6, 4, 0 |
| **Cirsium arvense** | : 9, 2, 0, 0 |
| **Boreava orientalis** | : 38, 58, 22, 0 |
| **Polygonum bellardii** | : 15, 2, 2, 4 |
| **Sinapis arvensis** | : 47, 27, 0, 0 |
| **Galium tricornatum** | : 52, 28, 12, 1 |

99.13 % seedling emerge on the basis of the whole species were found to be in the first 10 cm. depth of the soil, where the percent was 99.53 for monocotyledons and 98.65 for dicotyledons. For the species, optimum and maximum germanination depths were 2-5 and 5-15 cm, respectively.

In another aspect, the emerging rates in respect of the seasons were as follows for the whole species, for mono-and dicotyledons, respectively.

1990 spring : 81.15, 76.74, 86.25
1990 fall : 14.23, 23,26, 3.78
1991 spring : 4.62, 0.00, 9.97

## Effect on the Flora of Weeds of Different Soil Tillage Methods in Maize

H. DEMİRKAN[18] Y. NEMLİ[18] M. DEMİRCİ[18] I. TEPE[41]

This article is a report on different soil tillage methods (treatments with cultivator, rototiller, plough and dutzi+amazon) how they effect on the flora of weeds and the important common weed species in maizes produced as second crop after wheat plants were harvested.

**Amaranthus retroflexus** L., **Cyperus rotundus** Pursh., **Portulaca oleracea** L., **Solanum nigrum** L., **Chenopodium album** L., **Tribulus terrestris** L. have been observed as dominant species in all experimental fields.

**C.rotundus** have showede the highest density in plots where zero tillage was performed wheares total decreases were seen in the density of Dicotyledoneae family members like **A.retroflexus, P.oleracea** and **S.nigrum** in both of the zero tillage and non-irrigated plots as compared to other treatments.

The population desities of the weed species was observed with cultivator, rototiller, plough and dutzi-amazon treatments as 23 %, 22 %, 17 % and 17 %, respectively. Moreover, it was found that the density of weed was lovest as 3 % in maize sown to non-irrigated plots.

## The Weeds, Their Intensity and Association in the Lentil Fields of Erzurum Region

H. ZENGİN[5] M.T. DÖKEN[5]

This study was carried out in Aşkale and Pasinler Distriots of Erzurum in 1990 to determine the weeds causing problem in lentil growing areas including their intensity and association. The species and their number were recorded in one square meter frames thrown randomly in number of times depending upon the dimensions of the fields which representing the characters of the area.

In this region 75 different weed species belonging to 21 families were identified and an avarage of 52.970 weeds were found in one square meter. The number of the species and their mean intensity varied according to the districts. The populated species in order were **Equisetum ramosissimum** Desf., **Convolvulus arvensis** L., **Cirsium arvense** (L.) Scop., **Centaurea cyanus** L., **Galium aparine** L., **Cirsium acarna** (L.) Moench., **Cephalaria aristata** C.Koch., **Lolium multiflorum** Lam., **Amaranthus retroflexus** L., **Polygonum convolvulus** L., **Tragopogon aureus** Boiss., **Chenopodium album** L., **Scandix pecten-veneris** L. and **Sideritis montana** L., The number of species found in Aşkale and Pasinler were 67 and 19 respectively while their intensity in per m2 were 52.940 in Aşkale and 53.000 in Pasinler.

The main weed species of the association in Aşkale was **C.cyanus.** This species formed association with all the populated species of the district except **G.aparine** which only grouped with **S.montana** and **C.aristata.**

## Research on Population Dinamism of Bifra (**Bifora radians** Bieb.)

B. TAŞTAN[43]

In this research, it is studied to determine the data related with the population dinamism of Bifra, a noxious weed of wheat filds in Centrol Anatolia Region of Turkey, in order to enable to form models that can be used in developing warning and forcasting systems in its control studies.

Germination and viability rates of the seed were determined by laboratory tests and the biologic stages from emergence to seed dropping were observed in plots of 1 x 2 m by sowing the weed alone or together whit wheat in various rates. Total number of seed formation and the rate that entered in the soil were observed in natural conditions.

The rates of germination and viability of seed, deaths, matured plants, seed occurence and number of the alive seed that transferred to the next year were determined in figure by various experiments and using these figures, Weed Predictive Index was calculated for wheat - fallow systems.

## Untersuchungen zu Manche Biologieschen Eigenschaften der Stengellosen Distel (**Cirsium rhizoscephalum** C.A. Meyer)

Z. ÖZER[11]

Diese Arbeit wurde durchgeführt, um einige biologische Eigenheiten der stengellosen Distel (**Cirsium rhizocephalum** C.A. Meyer) zu untersuchen. Die auf den Versuchsaeckern des Versuchsgutes der landwirtschaftlichen Fakultaet (Atatürk Üniversitesi Erzurum / Türkei) gesammelten unterirdischen Teile der stengellosen Distel wurden an der Universitaet Hohenheim Inst. f. Phytomedizin untersucht und folgende Ergebnisse erhalten.

1. Bei den gaschromatografischen Untersuchungen wurde in den Pflanzenwurzeln Fructose, α-Glucose, Sorbit, β-Glucose, Inosit, und Saccharose festgestellt.

2. Nach dem ersten Vegetationsjahr wurde bei den Wurzeln ein löslicher Kohlenhydratgehalt von 72.57 % erreicht. Davon bestehen 70.68 % aus Saccharose und 1.89 % aus fünf anderen Zuckerarten. Dagegen verringert sich der lösliche Kohlenhydratgehalt im zweiten Jahr an der einen Hals gebildeten Wurzel, die eine Laenge von bis 10 cm erreicht. In der Trockensubstanz konnte ein löslicher Kohlenhydratgehalt von 25.17 % festgestellt werden. Davon bestehen 23.46 % Saccharose und 1.71 % aus anderen fünf Zuckerarten. Hier wurde festgestellt, dass Saccharose als Reservestoff verwendet wurde.

## Untersuchungen zur Anwendungsmöglichkeiten von **Raphanus sativus** - Saft Als Bioherbizid im Baumwolle

F.N. UYGUR[13] F. KÖSELİ[13] L. CESURER[20]

Als Anbauflaeche ist die Baumwolle eine der wichtigste Kulturart vom Çukurova-Gebiet. Die Unkraeuter werden in diesem Gebiet meistens mit der Herbizide unter der Kontrolle bringen. Diese Herbizide zeigen in Fruchtfolge nach dem Baumwolle festbare Nebenwirkungen.

Als Ziel von dieser Arbeit wurde um die Unkraeuter besonders Alleppogras (**Sorghum halepense** (L.) Pers.) mit der Bodenmischungen von vor Baumwolle angebaute **Raphanus sativus** L. zu kontrolieren angenommen.

Dafür wurden die Bioherbizid-Wirkung von **R.sativus** - Saft auf die Keimung von Samen der 9 Unkrautarten und Baumwolle in Laborbedingungen und auf Austrieb der Rhizomknospen von **S.halepense** unter der Labor-und Freilandsbedingungen untersucht.

Die Ergebnisse zeigten, dass der **R.sativus** - Saft die Keimung von Unkrautsamen und Austrieb der Rhizomkrospen von **S.halepense** mehr als 50 % wirkt. Diese Wirkungen wurden bei Baumwollesamen nicht festgestellt.

## Effect of Trifluralin on Germination and Emergence of Some Melon (**Cucumis melo**) Cultivars.

O. TİRYAKİ[39] S. MADEN[2]

Trifluralin, which is used extensively in vegetable plantation in our country, is an effective herbicide for the control of annual grasses and broadleaf weeds.

In the germination tests, which were carried out with 0, 0.5, 1 ve 2 ppm doses of trifluralin in the petri dishes, the percent germination between non-treated and 2 ppm-treatment were found significant statisticaly after 8 days sowing. For Yuva, Kırkağaç, Kuşçular and Alaaddin melon cultivars these percentages were found 35.00, 13.30; 81.70, 61.70; 96.70, 91.70; 8.30, 3.30, respectively, at the non-treated and 2 ppm-treatment. The percent germination among the melon cultivars were found significant at the same trifluralin doses.

In the field studies, which were carried out with same trifluralin doses and same cultivars, the percent emergence between nontreated and 2 ppm-treatment were found significant statisticaly after 14 days sowing. For Yuva, Kırkağaç, Kuşçular and Alaaddin melon cultivars these percentages were found 56.65, 8.35; 43.35, 6.65; 51.65, 6.65; 26.65, 1.65, respectively, at the non-treated and 2 ppm-treatment. The percent emergence among the melon cultivars were not found significant statistically, at the same trifluralin doses.

Generally, increases of trifluralin doses, caused decrease of germination and emergence. This decrease, especially, has been found significant between non-treated and 2 ppm treatment.

## Effect of N Fertilizers on Aminoacids of Wheat under Herbicide Applied and Non Applied Conditions

N. ERYÜCE[19] D. ANAÇ[19] Y. NEMLİ[18] K. DAMCI[19]

Cumhuriyet-75 wheat variety is widely grown in Aegean Region-Turkey. Effect of different nitrogen fertilizers on different aminoacids of wheat grain were studied under herbicide applied and non applied conditions.

A field experiment was undertaken by applying 3 different N fertilizers in different combinations as Amoniumsulphate + Amoniumsulphate; Amoniumsulphate + Urea; Urea + Amoniumnitrate. The trial was conducted in two blocks with three replications. 2. 4 Dichloro phenoxy acetic acid was homogenously applied to one of the blocks.

Sixteen different aminoacids were determined in wheat grains and compared according to treatments.

## Researchs on the Effects of Some Herbicides Used in Grain Fields on **Drechslera sorokiniana**

S. ÇETİNSOY[43]

**Drechslera sorokiniana** (Sacc.) Subram is an fungal agent causing root rot disease on barleys and wheats. Plus to control weeds among grains the herbicides like Tribenuron-methyl % 75, Fenoxaprop-ethyl % 7.88 and 2,4-D isooctyl ester are used in Turkey. In this research the effects of these herbicides on **D.sorokiniana** were found out. In field trial the seeds of Tokak 157/37 cv.of barley were contaminated by the inoculum of S96 strain of **D.sorokiniana.** Inoculum included $10^5$ conidia in per ml of distilled water. 30g barley seeds were sown in each plot for 2 $m^2$. As pre-emergence Tribenuron-methyl 10g/ha; as post emergence Fenoxaprop-ethyl w/v 0,8 1/ha, 2.4-D isooctylester w/v 1.66-0.83 1/ha and Tribenuron-methyl Df 10g/ha were used. Trial was conducted with randomised plot design with 3 replicates and it included 9 characters. At the stage of head 100 plants from per plot were pulled out and examined from the point of disease.

In laboratory trials presuming the whole of the herbicides used in field were passed into the soil water, the dosages of these herbicides were calculated and the effects of these herbicides on **D.sorokiniana** were evaluated by measuring the radiuses of miselial growth and conidia length and by counting conidia. These herbicides affected the miselial growth and amount of conidia.

Glasshouse trials were conducted with the inoculums from PDA mediums that included herbicides dosages or not. Herbicides affected conidia infection.

The results of field, glasshouse and laboratory trials were compared with each other.

## Studies on the Determination of the Root Rot Diseases of Greenhouse Tomato Crops in Turkey

M. YILDIZ[18] F. YILDIZ[18] N. DELEN[18]

Tomato has been one of the highest growth rate on the greenhouse grown vegetables during the recent years in the Aegean and Mediterranean coastal areas. The successive cropping habit of the growers in the greenhouse has revealed many problems caused by the soil-borne fungi, in addition to the other diseases.

This study was carried out to determine the causal agents of the rots in Antalya and Fethiye greenhouse regions during 1987, 1988 and 1989. **Pyrenochaeta lycopersici** was observed as one of the most frequently isolated fungus on different root lesions and time intervals. The fungus was obtained with the rates of 46.7 % in Fethiye and 30.4 % in Antalya.

This values was higher in the isolations from the samples showed corky root's typical symptoms. This range has differed in 55-60 % for Fethiye and 50-64 % for Antalya. **Fusarium** spp. and **Colletotrichum coccodes** were the other common fungi on the isolations. **C.coccodes** was mostly isolated from the black dot symptoms of the infected parts in April than January. The other fungi, were isolated in the lower incidences. If the results were evaluated for three years, the isolation percentages were as follows; **P.lycopersici** (39.6 %), **Fusarium** spp. (22.3 %), **C.coccodes** (10.3 %), **Alternaria** spp (6.7 %), **Pythium** spp (6.1 %), **Phytophthora** spp (4.1 %) and **R.solani** (1.5 %).

## Investigations on the Interaction of Fungicides and Antagonists for Gray Mould (**Botrytis cinerea**) Disease Control

F. YILDIZ[18] M. YILDIZ[18]

**Paecilomyces lilacinus** and **Bacillus firmus** were found antagonistic to **Botrytis cinerea** were isolated from phylosphere where tomato had been grown in the greenhouse. Dicarboximides (Vinclozoline, Iprodione, Procymidone) and Sulphamide (Dichlofluanide) known as effective against to **B.cinerea** were tested and found that ineffective against the above mentioned antagonists. In these tests; the fungicide doses were 0.3, 10, 30, 100, 300 µg/ml.

Two experimental pot trials were carried out in order to control gray mould (**B.cinerea**) by antagonists of **P.lilacinus** and **B.firmus** resistant to several fungicides commonly sprayed on greenhouse tomatoes in alternation with dicarboximides in greenhouses where fungiside resistant strain of **B.cinerea** are frequent. The antagonists and fungicides alone partially controlled the pathogen on GC 779 and Novy$F_1$ (206) tomato varieties. The integration of chemical and biological control measures showed better results than for the fungicide alone. **P.lilacinus** (Filtrate) + Iprodione (50g/100 lt), **B.firmus** (filtrat) + Iprodione (50g/100 lt) gave better results; the effectivity range was 82.6 % and 88.5 % respectively. The spore suspensions of the antagonists performed very poorly results on the in-vivo tests. Further trials are needed to investigate the antagonists in alternation with fungicides.

## Study on Combined Soil Solarization and Low Dose of Fumigant to Control of the Root and Crown Rot (**Phytophthora capsici** Leonian) on Peppers

S. YÜCEL[42]

In this study, a comparision was made between solar heating, solar heating plus a reduced dose methyl bromide (40 g/m$^2$), solar heating plus the recommended dose of methyl bromide (80 g/m$^2$) and untreated controls.

Solarization presents an alternative method to control a number of soilborne biological agents. Field trials of soil solarization were conducted for 8 weeks during summer. Inoculum of pathogen are buried in plots down to 5, 15, 30 and 45 cm depth. The effect of treatment on inoculum was very obvious in 5 and 15 cm. It was very little effective in 30 cm and not effective in 45 cm depth. The temperatures under the tarps were on the average 4-8°C higher than those at equivalent depths in the control plots.

During vegetation period, disease incidence was determined for each plots. However disease incidence was found much higher than what was expected, metilbromide was the most effective application. It has been followed by solarization plus a reduced dose methyl bromide, solarization and control, respectively.

Wrong irrigation and drainage problem increase the disease losses. Taking care of drainage measures and suitable irrigation practices after soil solarization, the disease may be controlled because of the zoospores can not move toward pepper roots in saturated soils. Cultural measures against to this disease must be regularly applied. Otherwise the succes of the appications will be very limited.

## Investigations on Aflatoxin and Ochrotoxin Production and Their Control in Figs in Aegean Region

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Recently, aflatoxin causes söme difficulties in fig importation. To determine the conditions of aflatoxin production and prevent it, this study was carried out in Aydın and İzmir between the years of 1988 and 1990.

According to the results, **Aspergillus flavus** causing aflatoxin was isolated at all stages which the samples were collected. It was found that aflatoxin production began at the stages. In general. There is a parellel stituation between **A.flavus** solation and aflatoxin production.

In the study, **Blastophaga psenes, Carpophilus** spp. and **Drosophila** spp. were found to be vectors carrying **A.flavus** and the other mould fungi. In the studies of the determination of the ralation between climatic conditions and aflatoxin production, it was found that water activity of fig was important rather than mean temperature and relative humuditiy.

It was came to the conclusion that use of UV lamb was useful to separate the figs with aflatoxin from the clean figs and use of UV lamb was necessary in entrance of factory.

It was found that chemicals were not effective on **A.flavus** growing and aflatoxin production.

Ochrotoxin A was determimed above level of tolerance in 16 of samples.

## A New Disease Occurrence Diplodia Cane Blight (**Diplodia natalensis** Pole. Evans) on Vine in the Agean Region

M. ARI[44] A. KAPKIN[44] S. ÖZ[44]

During the surveys of vine diseases in grapevine nurseries in 190 brownish black blight-like drying areas on young shoots were noticed. These drying areas developed both on the shoots kept in the callus growth chambers and in the field on crafted Sultana seedless and local uncrafted cultivars. Shoots and cuttings were plated on PDA medium and incubated at 23-25 C°. The fungus growing on PDA was described as **Diplodia natalensis** Pole Evans on the basis of its taxonomic characteristics. Pathogenicity tests were performed and the fungus reisolated.

In Manisa, the disease incidence and the disease prevalence on crafted seedless cultivars were 0.18 % and 10.37 %; and those on local uncrafted cultivars were 0.15 % and 30 %, respectively during the spring surveys. In Denizli the disease prevalance on crafted seedless cultivars were 5,12 % and 33 % during the spring surveys, and 5.76 % and 33 % during the fall surveys, respectively.

On the other hand disease incidence was up to 30 % in callus growth chambers.

## Recherches Sur 1'Induction de la Resistance Contre la Maladie D'excoriose de la Vigne (**Phomopsis viticola** Sacc.)

R. ÜNAL[18] E. ONOĞUR[18]

Les résultats des recherches effectuées au sujet de l'induction de la résistance dans la relation "hâte-pathogene" de **Phomopsis viticola** et de la vgne, montrent que, parmi les 17 variétés et porte-greffes de vignes testés, certains sont sensibles tandis que certains sont résistants et que les porte-greffes sont plus résistants.

Selon les résultats des analyses et des examens realisées sur les 4 variétés et porte-greffes choisis, les composés phenoliques ne jouent pas un role dans la résistance. De façon semblable, on na pas pu établir le role de la lignification de la membrane squeletique dans la résistance, puisqu' elle apparaissaienttard. Quand des plantes ont été inoculées avec **Phomopsis viticola** ou bien traitées avec les agents inducteurs (biotic ou abiotic), on a constaté que'elles produisaient une substance fluorescente. D'apres la littérature, ces substances peuvent etre resveratrole et ses derivés qui sont des composés a la nature de phytoalexine. Quand on a recherché la presence des phytoalexines avec la méthode "diffusion de la feuille", on a observe", on a observé que les substances qui provenaient des plantes résistantes, inhibitaient la germination des spores d'une façon plus éfficace.

On a constate que parmi les méthodes qui peuvent etre utulisées pour le but d'induire la résistance, certaines étaient réussies. Les plantes qui été inoculées avec la pathogene avant l'infection, se montrent plus résistantes a cette maladie. Cela est valable aussi pour des plantes traitées avec certaines composés synthethiques.

Selons les resultats des éssais qui serons réalisés **in vivo,** l'utilisation de ces méthods en pratique peut étre proposée.

## Investigations on Biological Control of **Chondrilla juncea** L. by **Puccinia chondrillina** Bub. et Syd.

T. NEMLİ[18]

**C.juncea** (skeleton weed) is an important perennial weed of wheat agriculture in Australia. The successful control method against to this weed have been obtained by use of the rust fungus **P.chondrillina** as a biocontrol agent in classical strategy. But the rust resistant forms of the weed, like broad leaf and intermediate leaf forms have been selected.

This study that is a part of international macro project propped by C.S.I.R.O. attempts to find out new virulent races of the fungus against to the rust resistant forms under field condations.

According to primary results, skeleton weed populations have extensive genetical variations and geographic distribution in Turkey, and the fungus has too. Some of the locations are given in the study. The narrow leaf and intermediate leaf forms of the plant have been infected by the fungus in one of the experimental fields. The severity of the infections on two forms have been developed approximately in same level. However the rate of diseased plants was very high level (100 %) on narrow leaf and very low (12,7 %) on intermediate leaf forms. There was no infection on broad leaf form.

The study has been carried on, and the complete results will be published at the end of the project.

## Fungitoxic Effects of Some Native Plants Occuring in Antalya

C. ÇAKIR[1] O. YEĞEN[1]

The fungitoxic effects of all components and the volatile oils extracted from **Thymbra spicata L.** var. **spicata, Satureja thymbra** L., **Laurus nobilis** L., **Inula viscosa** L., **Salvia fruticosa** Miller, **Mentha spicata** subsp. **spi-cata, M. piperita** L., **Nerium oleander** L. and **Euphorbia characias** subsp. **wulfenii** on the most common soil-borne diseases encountred in many plants were studied. Of these, **T.spicata, S.thymbra, L.nobilis, I.viscosa, M.spicata, S.fruticosa,** respectively, were the most effective. However, other plants showed low or no effect on 4 fungi. When the volatile oils from the most effective plants were given 0.1 ml to weighing papers placed in petri dishes, the misel growth of fungi were significantly reduced. It's found that the volatile oils from **T.spicata** and **S.thymbra** showed fungicidal effect on fungus species tested. The volatile oil of **M.spicata** showed fungicidal effect on **R.solani** and **P.capsici,** but only fungistatic effect on other the rest of fungus species. Moreover, the volatile oils from **L.nobilis** and **S.futicasa** showed fungicidal effect only on **P. capsici.** The volatile oils of the rest of plants showed fungistatic effect on fungus species. It's found that the fungi were effected differently by extracts of plants and their volatile oils studied. **S.sclerotiorum** was the most resistant fungus, while **P.capsici** was the most sensitive.

## An Investigation on the Pathogenicity on Some **Trichoderma** spp. to Lemon Fruits

Ş.A. AKTEKE[29]

**Trichoderma** spp. that live on the organic metarial in soil are the main components of the soil mycoflora. The species of this genus have been experimented against some citrus and many other plant diseases as antagonistic agents in recent years.

In this study, 5 **Trichoderma** species (**T.harzianum** Rifai; **T.hamatum** (Bon.) Bain; **T.pesudokoningii** Rifai; **T.aeroviride** Rifai; **T.viride** Pers ex S.F. Gray) were inoculated on injured peels of Kara lemon fruits. This fruits were put in an incubator at 25°C for incubation and observed the development of disease for 15 days.

As the result, amongst these agents, the only **T.pesudokoningii** infected the fruits. This species formed rottenness at the radius 7.57 mm in 6 days. It reached 21 mm in 13 days and made rotten whole fruit by covering all surfaces and inside of it.

## Biological Control of **Botrytis cinerae** and **Gleosporium** sp. on Appple and Pear with **Bacillus subtilis**

H. BASIM[1] M.T. MOMOL[1] O. YEĞEN[1]

In this study, two **Bacillus subtilis** (Ehrenberg) Cohn. Isolates, which are known strong antagonist against most of plant pathogenic fungi **In Vıtro,** were used as antagonist. Different does of culture filtrate obtained from **Bacillus subtilis** isolates were tested against postharvest diseases of apples and pears caused by **Botrytis cinerae** Pers. F. and **Gleosporium** sp. **In Vıtro** by using a special antibiotic production medium. Moreover culture filtrates were tested against spore germination of pathogenic fungi and **In Vıvo** effects of culture filtrates against two pathogens were determined too,

According to the results of this study, it was determined that culture filtrates obtained from two **Bacillus subtilis** isolates were strong inhibitors against **Botrytis cinerae** and **Gleosporium** sp.

# Inhibition of Rot on the Ankara Pears Which are Infected with **Penicillium expansum, Botrytis cinerae** and **Rhizopus nigricans** by Using Gamma Irradiation in the Standart Storage Conditions

O. TİRYAKİ[39] S. MADEN[2]

Our investigation was carried out to inhibit. Ankara pears rot, on condition that 0°C and 85 - 90 % relative humudity. Doses of 1, 2 and 3 kGy didn't inhibit pears roting, complately. But infection was delayed in a certain period.

After 10 days irradiation, unirradiated pears which were infected with **P. expansum** were shown 12.13 mm rod diameter. Whereas at 3 kGy this value was 9.67 mm. After 60 days irradiation the rot diameters increased to 53.17 mm and 39.38 mm for unirradiated and 3 kGy dose, respectively.

At the pears which were infected with **B. cinerea**, although unirratidated pears were shown 25.63 mm rot diameter, irradiation with 3 kGy were shown 13.21 mm rot diameter within 10 days after irradiation. After 35 days treatment doses of 0 kGy and 3 kGy were shown 46.29 mm and 37.54 mm rot diameter, respectively.

These differences were found significant statisticaly, and also roting fruit was stimulated with 1 kGy, for both fungi.

Effects of irradation on cultural characters of fungi has been investigated by reisolation; there was no difference between unirradiated and irradiated with 3 kGy for **P. expansum** cultures. Although there was no difference between colony diameters of both unirradiated and irradiated with 3 kGy, irradiation with 3 kGy was shown heterogenous sporulation and heterogen mycelial growth for **B. cinerea** culture, at 23°C temperature.

Effects of irradation on pathogenicity of fungi have also been investigated; in the 7 days observation results there was no difference between unirradiated and irradiated with 3 kGy for **P. expansum**, whereas for **B. cinerea** at the same period there was significant difference. Difference of **B.cinerea** pathogenicity was more continous than **P. expansum**, at 23°C temperature.

On the **R. nigricans** there was no growth in any irradiation doses and unirradiated pears at 0°C temperature. **P. expansum** was more sensitive than **B. cinerea.**

## Investigations on the Inhibition of the Some Important Storage Rots by Gamma Irradiation

M. GÜRER[44] O. TİRYAKİ[39]

The effect of gamma irradiation on the mycelial growth of some important storage rots agents as **Penicillium expansum, Rhizopus stolonifer**, and **Botrytis alli,** at 22 ± 1°C invitro was investigated.

Seven day-old cultures, grown on PDA were irradiated with doses of 0, 1, 2, and 3 kGy at gamma irradiator for **Penicillium expansum,** and **Botrytis allii**; 0, 1, 2, 3, and 3.5 kGy for **Rhizopus stolonifer.** After irradiated cultures and resown to fresh PDA. Cultures were held at 22 ± 1°C while being periodicaly measured.

The most effective gamma irradiation dose that inhibites of the mycelial growth of fungi was found 3 kGy for **P. expansum,** and **B. allii**; and 3.5 kGy for **R. stolonifer.**

Their effects on causing rot were also investigeted on the fruits and onion at the laboratory conditions (22 ± 1°C). After 7 days inoculation; at the apples, which were inoculated with **P. expansum,** control and 3 kGy treatment were shown 29.25 and 23.95 mm rot diameter, respectively. These values for onion, which were inoculated **B. allii**; were 31.45 and 27.60 mm.

And also at the peach, which were inoculated **R. stolonifer**, control and 3.5 kGy treatment were shown 72 and 65.5 mm. rot diameter, respectively, 3 days after inoculation.

# Recherche Sur la Conservation,la Pourriture et le Deperissement des Fruits de Certaines Mandarines

K. TURAN[42] S. TUNAR[7]

La travail a été conduit deux ans. Les fruits de mandarine de frement, nova et de mineola tangela ont été mis dans les dépôts qui ont les conditions de température de 3°C, 5°C, 7°C et 85-90 % d'humidité relative. On a mèsureè le taux de pourriture et de dé périssement, le changement de jus de poids, d'acidité et de vitamine - C des fruits, par intervalles, pendant la conservation. D'autre part, à un travail, sur 7 caractéres d'essai, on a étudié l'éfficacité de **Penicillium digitatum** (champignon de moisissure verte) Seulement sur les fruits frement, dans les contions de dépôt ci-dessus.

Selon les espéces, les conditions de dépôt et les intervalles de durée de conservation Les taux de pourriture et de dépérissement on devenu différent,

Des pourritures des fruits, on a isolé **Penicillium digitatum, P. italicum,** le plus souvent, et **Alternaria** sp., **Sclerotinia sclerotiorum, Fusarium** sp., **Botrytis cinerea, Epicoccum purpureum, Trichoderma** sp.

Les fruits sans traitement de frement sont restés indemmes dans le taux de 98,67 %, dans les conditions de 3°C température et d'un délai de 42 jours de conservation.

Pendant le travail de premiére année on a vu que se sont produits la perte de poids, d'épaisseur d'écorce, et la dimunition D'acidité, de vitamine C; et de quantité de jus, dés la moitiée du temps de corservation, mais la quantité de matiére n'apas changé.

Pendant le travail de deuxiéme année on a constaté la dimunition de poids et d'acidité. I' amincissement de L'écorce, l'auqmentation de jus et de matiére céche, la stabilité de vitamine - C.

Selon les résultats abtenus, dans les conditions de 85 - 90 % d'humidité relative, la température la plus covenable est 3°C, et aussi le 5°C est favorable à conserver les fruits de nova, frement et minneola tangelo.

## The Effect of Paclobutrazol (Growth Regulator) on Mal Secco (**Phoma tracheiphila** (Petri) Kanc. et Ghik.)on Lemon Trees

İ. ÇİMEN[7] A. ÇINAR[13] A. ERKILIÇ[13]

Mal secco (**Phoma tracheiphila** Kanc. et Ghik) is one of the most important fungal disease of lemon trees in İçel provience. It may become possible to obtain resistant trees in orchard by means of some cultural practices. The aim of this study was to determine the possibility of the use of paclobutrazol, growth regulatafor resistance studies.

The effect of paclobutrazol on the development of **P. tracheiphila** was tested on kütdiken lemon, a local variety of Türkiye, in soil and faliage in glasshouse conditions. The results were evaluated by using the scale with 5 category. The trees with bark inoculations in control plot showed 4 value of disease severity. On the other hand, the foliage and soil applications of paclobutrazol reduced the disease severity 33.5 and 50.0 percent, respectively. The foliage and soil applications of paclobutrazol against foliage inoculations of **P. tracheiphila** reduced the severity of the disease 57.0 and 71.6 respectively.

The effect of paclobutrazol on shoot development was tested on 4. year-old kütdiken lemon trees in field. The applications of paclobutrazol at rate of 600 ppm twice and 200 ppm four times shortened the length of nedes and internodes 23.13 and 14.98 percent respectively; and flowering increased 153.8 percent, but there was no statistical difference for the number of fruits.

The results showed that the applications of paclobutrazol against **P. tracheiphila** to reduce the severity of the disease was promising.

## Some Important Fruit Diseases Observed on Peach, Apricot, Plum, Sweet and Sour Cherry Trees in Tokat Area

D. YANAR[15] A. ÇITIR[11]

As a result of observations on peach, apricot, plum, sweet and sour cherry trees around the central District of Tokat Region some fruit diseases were determined in 1989 and 1990.

Brown rot diseases on all store fruits caused by **Monilinia laxa** (Aderh et Ruhl.) Honey, have been prevailing infections in the area. Typical symptoms of brown rot were determined as twig and blossom blight, die back, and rot on fruits as well as mumification of rotten fruits. Shoot hole diseases caused by **Clasterosporium carpophilum** (lev.) Aderh. were another prevealing infections on stone fruits. Peach leaf curl disease caused by **Taphrina deformans** (Berk.) Tul. has attained epidemiological scale in the area. Plum pox disease on plums caused by **T. pruni** (Fuck.) Tul. somewhat has become noticeable in recent years. Powdery mildew of peach caused by **Sphaerotheca pannosa** (Wall.) lev. var. **persicae** Wor., and powdery mildew diseases caused by **Podosphaera tridactyla** (Wallr.) de Bary on stone fruits other than peach have been determined widespread in the area. Red-leaf spot of plum caused by **Polystigma rubrum** (Pers.) DC. and Silver-leaf disease of peach caused by **Stereum purpureum** (Pers. ex Fr.) Fr. were other important fungal diseases. Beside these fungal diseases. Preffinger disease of sweet cherry caused by Raspberry Ring Spot Virus (RRSV) a Nepovirus was only newly identifed disease in the area.

# Investigations on the Bio-Ecology of the Leaf-Scorch (**Gnomonia erythrostoma** Pers. Auerw) Disease that Causes Damage on Sour Cherry Trees in Afyon

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M. GÜRER[43] M. BERKER[43]

This study was carried out in sour cherry orchards in İnaz, Çakır and Erkmen villages of Afyon province up to 1989.

The biological stages that will be base to the control possibilities of the fungus (**Gnomonia erythrostoma** (Pers.) Auerw were investigated in between 1980-1982. Cultural and chemical control possibilities of the fungus in accordance with the fungus biology and plant phenology were studied from 1983 up to 1989.

The perithecia maturation dates in 1980, 1981 and 1982 were 3rd of April, 13th of March and 1st of April respectively. These dates were also to bud burst periods in the plant phenology. The first ascospor dispersals were determined on the 14th of April, 21st of March and 6th of April respectively.

Positive results were obtained from the applications with some chemicals and compounds to prevent the pycnidia and perithecia formation. The compounds used were DNOC and a systemic fungicide and 96 % and 90 % effective respectively.

The relation between the total temperature and disease occurence in January-March were investigated but no relation could be determined. However close relation between the rain fall and disease occurence was determined. Amount of rainfall during January-April of 1986 and 1989 when there was no disease occurence, was found to be very low. Maximum disease occurence (80.30 %) was in 1984, and minimum (7.10 %) was in 1988.

## Combined Products Against Downy Mildew Diseases and their Application Strategy

M. COPÇU[9]

Recently, Cucumber raising in Aegean Region, with the production aimed at exportation has been reached to important economical levels.

Today since approximately 5000 ha production is involved in concentrated agricultural process, the plant protection problems are considerable. Cucumber Downy Mildew (**Pseudoperonospora cubensis** Berk. and Curt.) is the main problem which requires chemical plant protection.

Since the contact fungicides are insufficient in the existing agroecological conditionsand the systemic agents have very high risk of resistance when they are used alone. Therefore it is essential to use combined products (contact + systemic) against Downy Mildew diseases.

Among these, the effects against Cucumber Downy Mildew and the validity of strategies for application of RIDOMIL MZ 72 WP which includes the active ingredients metalaxyl 8 % and mancozeb 64 % has been established in the field trials carried-out in Ödemiş (İzmir) during 1987-1988. In these trials very sensitive (VS) and tolerant (MS, MR) cucumber varieties have been analyzed; efficiency of spraying equipments according to the plant growth stages has been examined and the dose transformations which are required the equipment alterations have been established.

The effects of chemical agents with different structures under various agroecological conditions have been compared as farmers' applications.

As a result of 5 field trials in the Aegean Region, in which 250 g Ridomil MZ 72 WP in 100 l. water has been applied against the Cucumber Downy Mildew diseases according to the GIFAP-FRAC-Phenylamide Working Group suggestions as,

* to initiate the treatment as protectively,
* to treat at most 3 times,
* 10-day intervals between the treatments

Ridomil MZ 72 WP has been shown as excellent effectiveness as 84.0 - 95.7 % due to varieties and also infection pressure.

On the other hand, spot application with knapsacksprayer til shoot elongation period in which growing is vertical, then band apllication with motorised knapsack sprayer and making the concentration double for motorised knapsack sprayer have been approved for an efficient chemical plant protection.

## Effectiveness of Tolchlofos - Methyl to **Rhizoctonia solani** Isolates

N. DELEN[18] T. ÖZBEK[18] İ. YILDIRIM[18]

Tolchlofos-methyl is a very effective chemical to some soil pathogens especially to **Rhizoctonia solani.** This chemical has been applied to carnation seedlings for controlling **R. solani** in Turkey since 1986. In spite of the effectiveness of the chemical to **R. solani,** in some greenhouses, the pathogen can continue to infect the plants after the application of the chemical. For this reason in the beginning of the study effectiveness of tolchlofos-methyl to **R. solani** isolates, collected from diseased carnation plants were tested. According to these tests while $ED_{50}$ values of 55 isolates of 56 were between < 0,1 and 0,3 µg/ml, $ED_{50}$ value of one isolate was found to be 300 µg/ml. On the other hand, MIC values of the isolates varied in rather wide limits. These variations were for 4 isolates 0,3 - 1,0 µg/ml, for 34 isolates 1,0-3,0 µg/ml, for 3 isolates 3,0-10,0 µg/ml, for 4 isolates 100, 0-300, 0 µg/ml, and MIC value of one isolate was bigger than 300 µg/ml.

There were no differences found between the virulences of the less sensitive isolate and sensitive isolates. But growing speed of the less sensitive isolate was slower then the sensitive ones.

Less sensitivity colud be increased after the continuous transfer of the sensitive isolates to increasing concentrations of tolchlofos-methyl doses. Effectiveness of the chemical have been found rather low in the carnation plants inoculated by the less sensitive greenhouse isolate of the pathogen. It is interesting that, the effectiveness of the chemical that was higher to the original sensitive isolate than to the same isolate, became less sensitive after the continuous transfers to the increasing concentrations of tolchlofos-methyl.

There were no significances obtained between the anastomosis groups and sensitivity to tolchlofos-methyl.

## Studies on **Alternaria solani** Isolates Less Sensitive to Iprodione

N. DELEN[18] T. ÖZBEK[18] M. YILDIZ[18]

**Alternaria solani** is the one of the most important pathogens of tomato. According to different studies iprodione can control the pathogen very effectively on the field or greenhouse grown tomatoes. But, because of the continious applications of the chemical the pathogen became less sensitive to iprodione in some parts of the country now. For this reason, sensitivy of **A. solani** isolates to iprodione and some other recomended fungicides were tested in the first part of the study.

Result of the laboratory and pot studies field isolates of **A.solani** were found more sensitive to iprodione then the greenhouse isolates. No differences obtained between the pathogenicities of sensitive and less sensitive isolates, besides of the less sensitivity of the isolates to iprodione, most of the isolates were found also less sensitive to some classical fungicides recomended in the country for controlling the pathogen as dichlofluanid, maneb, mancozeb and chlorthalonil.

In the second part of the study, effectiveness of some new chemicals were tested for controlling **A. solani** in Turkey. According to the **in vitro** and **in vivo** studies tebuconazole, mycobutanil, flusilazole, imazalil, prochloraz, fentin acetate and anizaline were the most effective chemicals to the isolates, sensitive and less sensitive to iprodione.

# Investigations on Sensitivity of **Sclerotinia (Monilinia)** spp. Isolates to Some Fungicides

S. T. DEMİR[44] N. DELEN[18]

This model study was carried out to determine the behaviour from the stand point of sensitivity reduction of fungicides, to find the strategy of the use of fungicides according to findings and investigate the role of isolates reduced sensitiviy in practice between the years of 1988 and 1990.

Material of study consists of 97 **Sclerotinia** spp. isolates obtained from cherry, peach and apricot, and benomyl, captan. dodine, thiram, vinclozolin and hexacanozole.

Sensitivity levels of isolates were determined on mycelium and spores. When the sensitivity levels of mycelium and spores are evaluated together, it may be emphasized that **Sclerotinia** spp. isolates are sensitive to hexacanozole and sensitivity of them decreases against the other fungicides.

The characteristic, permanence and fitness ability of the reduced sensitivity of isolates were determined. The permanence of the reduced sensitiviy were found by comparign with original isolates after isolates were transferred to PDA not containing fungicide. When $ED_{50}$ values of pre-transfer and post-transfer were compared, it was found that $ED_{50}$ values decreased in general even if they were not the important rates. The fitness, virulance, spore yield, colonial growth and competiton ability of the isolates reducing sensitivity were determined by comparing with sensitive isolates.

It was found there was no relation between lesion diameter, spore yield. colonial prowth and $ED_{50}$ values of isolates with the probability of 99 percent, and the isolates reduced sensitiy were fitness. Effect of fungicide doses recommended in practice on the isolates reduced sensitivity was similar to the other findings. Only effect o thiram doses recommended in practice and the other doses was at the same level on sensitive and resistant isolates.

When examined all findings of study, it may be determined that **Sclerotinia (Monilinia)** spp. isolates do not acquide problematic resistance to captan, dodine, benomyl and vinclozolin in practice but the reduced sensitivity has potential risk.

## The Studies on the Sensitivity Levels of **Alternaria solani** (Ellis and Martin) Sorauer Isolates to Some Fungicides

S. BENLİOĞLU[43] N. DELEN[18]

60 **Alternaria solani** isolates were collected from tomato growing greenhouse and open areas of Southern and Western Anatolia. The $ED_{50}$ and MIC values of these isolates were determined for 12 fungicides (maneb, zineb, mancozeb, propineb, thiram, metiram, captan, dichlofluanid, chlorothalonil, vinclozolin, iprodione and prochloraz) **in vitro.** The results of the **in vitro** studies showed that prochloraz, dichlofluanid, iprodion, maneb and mancozeb were the most effective fungicides.

Furthermore, growth rate and the stability of 11 **A.solani** isolates showing decreased sensitivity to fungicides were also determined. The $ED_{50}$ values of 11 isolates after 10 passages on unamended PDA indicated that most isolates were sensitive to fungicides in general. However, some isolates turned out to be reduced sensitivity to zineb, mancozeb, propineb and vinclozolin. In tehese assays, no significant correlations were observed between decrease in sensitivity and fitness.

Pot tests proved that dichlofluanid, iprodione and maneb could effectively control **A.solani,** even if these fungicides were used half of their recommended dosages, while moncazeb was slightly less effective than the other three.

## Studies on Bacterial Streak Disease (**Xanthomonas campestris** pv. **translucens** (Jones et al) Dye.) of Wheat and Other Graminae

G. DEMİR[44] N. ÜSTÜN[44]

Bacterial streak disease is one of serious diseases on wheat and triticale. Bacterium was isolated from diseased plants in the experiment plots of Aegean Agricultural Research Institute, and its pathogenicity was detenmined by performing artificial inoculation and it was reisolated. Bacterium is defined as **Xanthomonas campestris** pv. **translucens** according to the morphological, physiological and biochemical characteristics.

It was found that isolates from wheat caused disease on some wild Graminae spp except barley, rye, rice and triticale. In Aegean region, some widespread bread and durum wheat cultivars were determined to be susceptible to **X.campestris** pv. **translucens.** Ege 88 cultivar was found to be very susceptible to the pathogen.

## Evaluation of the Serological Methods for the Identification of Halo Blight Pathogen (**Pseudomonas syringae** pv. **phaseolicola**) of Beans

K. BENLİOĞLU[43] M. ÖZAKMAN[43]

Heat-treated and glutaraldehyde-fixed oella of **Pseudomonas syringae** pv. **phaseolicola** were used in the immunization and antisera were produced by injecting New Zeland white rabbits with two different methods. Strains of **P.s.** pv. **phasolicola,** and fluorescent pseudomonas isolated from dry bean seeds and some other plant pathogenic bacteria were tested by slide agglutination, Indirect Fluorescent Antibody Staining (IFAS) and indirect ELISA. Some important properties of the mentioned serological techniques and cross-reactions with various bacterial species were evaluated. Out of 3 different antisera, one, having the highest titre was more specific and IFAS was found to be more sensitive than indirect ELISA for the detection of **P.s.** pv. **phaseolicola.**

## Investigations on Effectiveness of Some Coppery Chemicals to Agent Of Bacterial Speck of Tomato (**Pseudomonas syringae** pv. **tomato**)

H. ÖZAKTAN[18] S. ÖDEN[41] N. DELEN[18]

The disease of bacterial speck has been sometimes caused to losses on the tomatoes both growing on the fields and in the greenhouses. Chemicals containing cupper or dithiocarbamate have been proposed in order to prevent the disease. In connection with residue problems of chemicals containing dithiocarbomate, new alternatives have been investigated. For the purpose of fact that the causal agent may be prevented as more without problem, effectiveness of different chemicals containing cupper such as cupper sulphate, cupper oxychloride, cupper ammonia and cupper hydroxide against isolates of **P.s.** pv. **tomato** were investigated by using laboratory and greenhouse tests. At the result of this study, it was determined that cupper ammonia and cupper hydroxide were very effective to **P.s.** pv. **tomato** Furthermore it was found that cupper sulphate was succesfully inhibited the growth of pathogen in laboratory whereas it was less effective in the inhibition of the growth of pathogen in greenhouse conditions. It was thought that differentiations of the solubility of cuppery chemicals were important on efectiveness of these chemicals against **P.s.** pv. **tomato.** According to laboratory and greenhouse tests there was obtained less sensitive isolates of **P.s.** pv. **tomato** to cupper oxychlorid.

## Detection of Ring Rot Disease (**Clavibacter michiganense** subsp. **sepedonicus**) of Potato Tubers

G. DEMİR[44] M. GÜNDOĞDU[44]

Potato ring rot (**Clavibacter michiganense** subsp. **sepedonicus**) is the most dangerous disease effecting potato trade in the world, and its tolerance is zero in all countries.

In previous years, the disease was determined by taking note of symptoms in Turkey. Therefore this disease causes some difficulties in our potato export. This study was carried out by the methods which are accepted by ECU and EPPO/OEPP to find the real situation of the disease and to prevent the dificulties in exportation.

Sixty-five samples were examined from Aegean region, and 35 samples taken from potato seeds imported from Holland (18), Germany (5) and Canada (12).

Indirect immunofluorescence (IF) method was performed in this study. Under suspicious conditions, biotest on eggplants and gram stain were also done in order to confirm it.

This study was indicated 100 samples have no pathogens from the stand point of both clear and latent infection of **C.michiganense** subsp. **sepedonicus.**

## Studies on Fire Blight Disease (**Erwinia amylovora** (Burrill) Winslow et al.) of Pome Fruit Trees

G. DEMİR[44] M. GÜNDOĞDU[44]

Fire blight (**Erwinia amylovora**) is a serious disease on pome fruits. The disease was firstly found in Aydın and Denizli provinces in Aegean Region in 1986. Between the years of 1986 and 1991, pathogen was determined at the different levels on pome fruit trees in all provinces of Aegean Region.

**In-vitro** sensitivity levels of 32 isolates of **E.amylovora** were investigated from the different regions to streptomycine sulphate and minimum inhibition concetration (MIC) were found to be 2-10 g/ml.

Under the field conditions, the effects of cupper oxychlorur 50; Copac E and Streptomycine respectively sulphate were 77.88, 74.42 and 78.96 % on 10 year-old Santamaria pear cultivar.

From the study carried out to determine the response of apple cultivars grown in Turkey, it was found that sport Golden of 15 apple cultivars tested was the most sensitive one. Twenty-two pear cultivars tested deacted to the pathogen differently and "Abbefetel" pear cultivar was found to be the most sensitive.

## Fire Blight Epidemics Caused by **Erwinia amylovora** and its Control in the West Mediterranean Region

M.T. MOMOL [1] O. YEĞEN [1] H. BASIM [1]
K. RUDOLPH [24] M.A. ZACHOWSKI [24]

Severe outbreaks of fire blight caused by **Erwinia amylovora** have occured on pear and quince in Turkey since 1985. The disease affected several pear and quince orchards. **E. amylovora** was isolated from pear and quince and was identified by using semi-selective modified MS medium and green pear test. Experiments were conducted on Santa Maria pears in the western Mediterranean region of Turkey to evaluate measures of chemical control and pruning. Blighted flowers and twigs were pruned and recorded on each of three assesment dates. Seven sprays of a mixture of copper oxychloride and maneb applied at five-day intervals during and after blossom period gave 82.47 % disease control with no phytotoxicity. Ammoniacal copper sulfate gave 61.04 % disease control. These results. were obtained in Korkuteli during a mild infection year in 1990.

## Investigations on Identification and Incidence of Fire Blight Diseases (**Erwinia amylovora** Burr. Winsloweta) on Pear Trees in East Mediterranean Region of Turkey

S. TOKGÖNÜL [42] Ö.ÇINAR [13]

This research on the identification and distribution of fireblight disease (**Erwinia amylovora** Burr. Winslow et al.) of pear trees has been conducted in Eastren Mediterranean Region of Turkey.

The pear trees in the region showed the typical symptoms of the disease. The bacterial isolates obtained from the samples taken from the infected trees have been identified as **Erwinia amylovora** in the laboratory.

In Eastren Mediterranean Region, the incidence ratio of disease was 43.51, 39.16, 76.57 and 9.12 percent in İçel, Adana, Kahramanmaraş and Gaziantep proviences, respectively.

The trees in the central provience of Hatay were extremely dispersed, and observations on these trees showed that the disease occured. According to the results obtained, the incidence ratio of fireblight found 42.37 percent. Heavy infections observed on the Santa Maria and Williams pear varieties which were common in the 1-5 year-old group which constitated 61 percent of the all pear orchards in the region. Although the disease occured on the native varieties, the causal agent of the disease has never been as destructive as it was on Santa Maria and Williams varieties.

## Investigation on the Susceptibility of Economicaly Important Almond Varieties Against. "**Pseudomonas amygdali**" Psallidas and Control Measures in Aegean Region Almond Orchards - Turkey

M. GÜNDOĞDU[44] G. DEMİR[44]

Through this study, carried out between the years of 1980-1988 in Datça (MUĞLA) and institute nurseris, sus-ceptibility of 15 varieties and control measures against (**Pseudomonas amygdali**) have been studied.

In Datça (MUĞLA), in 1980-1981, diseased branches have been taken away and the cut points have been treated with katran and 5 % bordeaux mixture. Later on two other aplications, one is at 75 % leaf-fall in autumn and the other pink bud stage, with 3 % bordeaux mixture have been done. By doing so, 90.33 % control has been actiaved.

15 varietes have been infected artificially in the institute nurseries, between 5.6-100 % results have shown that Tuono, Davey, Akbadem, Hacı Ali Bey, Kababağ, 5-1, 101-13, 160-1 varietes are sensitive but 101-23, Texas, 120,1, Non Pareil, 104-1, 101-9 and 300-1 varietes are resistant.

## Die Feststellungen der Forderung des Befalls von Unkrautarten des Çukurova-Gebites mit **Spiroplasma citri** Saglio et al.

S. UYGUR[13] F.N. UYGUR[13] A. ÇINAR[13]

Die Erreger der vielen Pflanzankrankheiten von Zitrus können um die Kulturarten zu infizieren einige Lebensperioden auf die Unkrautarten verlaufen lassen. Stubborn Erreger **Spiroplasma citri** Saglio et al. gehört auch die wichtigste Krankheitserreger von Zitrus. Im Çukurova-Gebiet sind die Orangenbaeumen besonders Sorte Washington-Navel 4.45-53.83 % mit dieser Krankheit infiziert.

Ziele von dieser Arbeit sind, die Bestimmung von mit **S.citri** infizierte Unkrautarten in Zitrus und von der Verbreitungsrate der mit **S.citri** infizierte Unkrautarten im Gebiet-Çukurova.

Bei dieser Studium wurden insgesamt 9 mit **S.citri** infizerte Unkratarten durch die ELISA-Test festgestellt. Die Verbreitungsrate der 5 Unkrautarten von diesen 9 Arten wurden im Çukurova-Gebiet als Staeigkeit und Deckungsgrad in Prozent erforschen könnte. Waehrend der Bestimmung der mit **S.citri** infizierte 5 Unkrautarten wurden auch die Infektionsrate der Stubborn-Krankheitserreger **S.citri** in Prozent festgestellt.

## Researchs on the Rate of Spread of the Stolbur Disease in West Anatolia in Industrial Tomato Raising Areas and on the Reasons of Its Appearing

Ü. YORGANCI[18] C. ÖNCÜER[18] Y. KARSAVURAN[18]

Stolbur, which is one of the important diseases of the tomato and caused by mycoplasma-like organisms, was observed at different rates from year to year in commercial tomato growing areas in our country.

Within the SANDOM Project in years 1988 and 1989, during the surveys which were organized regularly every three weeks in the production places after the seedling period, insects were collected both from the inside of the field and from the wild flora and all were identified.

In the investigations performed on the determination of the density of the disease among the tomatoes, the greatest rate of disease was observed in Yenişehir (Bursa). The studies on the insects which can be considered as vectors, proved that there was not any definite relation between the rate of spread of Stolbur and its density and the discovery of the **Hyalesthes obsoletus** which was accepted to be the main vector of Stolbur in literature. **H. obsoletus** was found to be very few even in the places where it was seen.

Depending on the obtained results, Yenişehir where the disease present and greatly observed every year, was decided to be the center of the observation. In order to research the statement of the other Cicadellidae members in Yenişehir / Karacaali and Karaköy yellow adhesive traps were left into four observation fields and moreover, **Empoasca** and aphids were placed in cages over the main observations fields. The experiments performed with various tomato cultivars were evaluated for the tendency to infection of Stolbur and as parallel to the data gained from yellow traps the researches based on the different sowing dates were carried out.

## Isolation and Culture of Some **Citrus** sp. Protoplasts

N.K. KOÇ[13] C. CAN[13]

Protoplasts were isolated from 3 weeks old stem calluses of lemon (**Citrus limon** var. Kütdiken), grapefruit (**C.paradisi** Macf.) and nucellar callus of sour orange (**C.aurantium** L.) The maceration medium consisted 0.3 % macerozyme R-10, 0.2 % cellulase R-10, 0.1 % driselase, 1/2 strength of MT macro elements, 0.35 M mannitol and 0.35 M sucrose. Protoplasts were cultured in liguid MT medium without phytohormones. Colonies with 15-20 % plating efficiency were observed after 6 weeks. When these colonies were cultured on MT medium any embryogenesis was observed. For the isolation and culturing of sour orange protoplasts, nucellar callus was used. The plating efficiency of these protoplasts was higher (30 %) than other **Citrus** sp. The colonies, which were observed in liquid MT medium, cultured on solid MT medium contain 2 % glycerol, produced embryos. These embryos were transfered to the MT medium with 1 % $GA_3$. After 2 months they regenerated plants.

## Plant Regeneration from Mesophyl Protoplasts of Tobacco (**Nicotiana tabacum** L. var. **xanthi**)

C. CAN[13] N.K. KOÇ[13]

Tobacco (**Nicotiana tabacum** L. var. **xanthi**) mesophyl protoplasts were isolated enzymatically. Enzyme soliton for maceration of leaves contains 1 % Macerozyme R-10, 1 % Cellulase R-10 dissolved in 0.4 M sucrose and basal Muras-hige-Skoog (MS) media with the pH adjusted to 5.7 within 10-12 h incubation period, the yield of protoplasts were in average $2x10^5$/g of leaf tissue with 50 % viability.

Protoplasts were cultured in the liguid medium that containing different combination and concentration of auxins, cytokinins, mannitol and sucrose. First cell division was observd within 3 days of culture. 1.0 mg/1 Kinetin + 0.5 mg/1 Naphthaleneacetic acid (NAA) + 2.0 mg/1 Zeatin combination was ave positive results for induce microcolonies from protoplasts. Microcalluses were transferred on a solid MS medium containing 1 % sucrose, 4 % mannitol 2.0 mg/1 NAA and 1.0 mg/1 6-benzylamino purine (BAP) for the establishing clonal cell lines of single cell origin. Embryogenesis was obtained in the 4 % mannitol, 1 % sucrose, 4.0 mg/1 Kinetin and 2.0 mg/1 BAP containing MS media. Shoots were transferred on the MS media with the 2.0 mg/1 2,4-dichlorophenoxyacetic acid (2.4-D) and 0.25 mg/1 Kinetin for rooting.

## Mechanically Transmissible Viruses of Corn in the Çukurova Region

S. BALOĞLU[13] T. AKTURA[13] M.A. YILMAZ[13]

Çukurova is an important corn production region. Due to having nutritious value corn has been known as a main cash crop. When the GAP projects (Southern Anatolia Projects) has completed corn will be replaced with cotton in this region. Due to expansion of corn plantation in the region several virus diseases will be appeared.

At the present, Maize Dwarf Mosaic Virus (MDMV) is an economically important corn virus disease in Adana, Mersin, Tarsus and Karataş. MDMV is a mechanically transmissible virus. In this work, virus was determined by bilological and serolocigal assays in all the fields we surveyed.

The virus was purified. Absorbtion ratio (260/280) was found to be 1.17. Under E.M. examination flexible rod-shaped virus particles were observed. **Avena fatua, A. sativa, Digitaria sanguinalis, Echinochloa crusgalli, Sorghum bicolor, S.halepense,** were found as a susceptible host. On the other hand **Phalaris minör** was found a new host.

In the Agar Double Diffusion Tests, virus was determined as a strain of MDMV-A.

## Studies on Some Major Virus Diseases in Imported Potato Seed Tubers by DAS-ELISA and Other Methods

S. ÇALI[42] N. YALÇIN[34]

Trials have been carried out in four varieties of potato seed tubers taken from five seed potato growers, and Potato leaf roll virus, PVY, PVX and PVS were taken into consideration in all tests and observations.

DAS-ELISA (Double antibody sandwichenzyme linked immunosorbent assay) was applied to the tubers taken from growers before planting and after harvest. Tubers, taken before planting, were grown one by one in pots and their leaf samples were tested by DAS-ELISA.

All DAS-ELISA tests applied to tuber and leaf tissue showed that every each seed potato variety is highly contaminated with the above mentioned four viruses.

Growing - on and mechanic inoculation tests showed no viral symptoms on foliage and indicator plants. However, early blight infection caused not to observe any virus diseases at the field on the foliage of the growers crop of which the tubers have been tested before.

The results taken with different methods showed us the presence of latent infections or the mild strains of the viruses tested. ELISA, as being a sensitive, rapid and economic, should be put in use in certification and quarantine services for the detection of some major viruses in Türkiye.

Lastly, imported materyal, here seed potato tubers, is recommended to be checked in the origin grower country before importation takes place.

## Investigations on the Virus-Borne Seed Degenerations of Potatoes in Several Production Locations of Turkey

F. ERASLAN[16]

Prested virus-free tubers of two largely grown potato varietes were grown one season at seven seed potato production regions over Türkiye. Their progeny tubers were tested for potato leaf roll virus and potato virus Y by ELISA.

In cultivar Resy highest infection rate with PLRV was detected at Erzurum as 70 %. It was 57 % in İzmir-Menemen; 33 % in Bolu-Merkez; 24 % in Niğde; 23 % in Bolu-Kındra and 20 % in Nevşehir-Kaymaklı. Infection rates of progeny tubers of same cultivar with PVY were 21 % in Bolu-Merkez; 19 % in Niğde; 13 % in Erzurum; 8 % in Bolu-Kındra; 2 % in İzmir-Menemen and 1 % in Nevşehir-Kaymaklı.

In general degeneration rates of cultivar Granola were lower than Resy in all locations except Niğde. Infection rates with PLRV and PVY of this cultivar found 1 and 6 in Bolu-Merkez; 6 and 6 in Bolu-Kındra; 29 and 8 in Erzurum; 40 and 2 in Niğde; 4 and 1 in Nevşehir; 25 and 0 in İzmir-Bozdağ and 4 and 3 in İzmir-Menemen.

Results shown that seed potato production programs in different regions should consider varietes and viruses in combination and have to be planned seperately.

## Obtaining Of Virus-Free Potato (**Solanum tuberosum** L.) Planting Stock Material Through Meristem Culture

M. KAYIM[13] N.K. KOÇ[13]

Meristem culture technique was used to obtain virus-free plant material from Bintje, Bright, Diamant, Escort and Resy potato (**Solanum tuberosum** L.) varietes infected with potato leaf roll virus (PLRV) and potato virus S (PVS).

The Murashige and Skoog's (MS) macro, Heller's (H) micro elements and different vitamins were used as a cultured medium. Apical and axillary meristem-tips were placed on culture medium containing different 6-benzylamino purine (BAP) + gibberellic acid ($GA_3$) hormone concentrations and combinations. All plants that produced **in vitro** were checked by Enzyme Linked Immunosorbent Assay (ELISA) to determine whether or not virus-free.

High concentration of BAP (2.0 mg/1) was effective in increasing shoot-length and node-number for the varieties; Bintje, Diamant and Resy. BAP+ $GA_3$ hormone combinations gave best results in inducing shoots in all varieties. Diamant and Resy gave best result in MS medium with 1.0 mg/l of 3- indole butyric acid (IBA) for **in vitro** clonal propagation and rooting, whereas Bintje and Escort in MS medium without hormone.

We were succesfull obtaining PLRV-free Bintje clones using meristem culture, but in other varieties meristem culture was less effective. PVS was eliminated in some Resy and Diamant clones but in case of Escort and Bright that wasn't possible.

## The Studies on the Determination of Tomato Mosaic Virus and Bacterial Wilt in Tomato Seeds

S. ERKAN[18] H. ÖZAKTAN[18] Ü. YORGANCI[18]

In the Present study Elisa was used to detect tomato mosaic virus (ToMV) and bacterial wilt (C.m.m.) in seed samples of standart and hybrid tomato cultivars from various institutions dealing with the production and marketing of seed. In the works conducted by the kits, which were purchased, containing alkaline phosphatase or peroxydase-labelled IgG fractions for the detection of both agents in tomato seed samples the suitable concentration of globulin, extraction buffer, enzyme-antibody conjugate and subtrate and necessary incubation periods were determined. According to the data from experiments it was found out that the tomato seed samples under test were not infected with ToMV and C.m.m. at the rates of % 53 and % 83, respectively.

## Corky-Bark Disease on Tomato in Adana

M.E. GÜLDÜR[13] M.A. YILMAZ[13] S. BALOĞLU[13]

Because of economic affairs, increasing possibility of irrigation faciliteis and favorable environmental conditions the vegetable production has been increased in Çukurova region. Several viruses attack tomato and reduce the yield. Due to continious cropping in the same field and intensive manual labor, several virus diseases are common on tomato.

In Karataş, tomatoes were found with unusual symptoms that consist of raised corkybark and line patterns. The infected furuits are covered with corkybark symptoms. Foliar symptoms ranged from mild to moderate mosaic.

Virus was inoculated on different test plants, examined under elektron microscopy and tested by Agar Double Diffusion test. Necrotic, chlorotic, systemic mosaic and mottling type of symptomps were observed on the indicatör plants. Rod-shaped virus particules (18x300 nm) were observed under electron microscopy. Absorbtion ratio of purified virus (260/280) was found between 1.17 and 1.21,

Virus gave positive reaction against to ToMV antiserum from England and ToMV antiserum from Şanlıurfa in Agar Double Diffusion Test. According to the this research corky-bark symptomps caused by the pathogen on tomato was determined as a strain of Tomato Mosaic Virus.

## Investigations on a Virus Disease Causing Epidemic Tomatoes

Ü. YORGANCI[18] S. ERKAN[18]

A virus disease, which causes partial or total death of the tomato plants in addition to the preobserved symptoms of tomato mosaic, was detected extensively in the locations of Mustafakemalpaşa and Turgutlu in the commercial tomato growing areas in 1990.

The following test plants were inoculated using sap of the plant samples collected to determine the causing agent of the disease: **Nicotiana glutinosa, N. tabacum** cv. "Maden, **Chenopodium amaranticolor, C. quinoa, Gomphrena globosa, Datura stramonium, Lycopersicon esculentum, Capsicum annuum, Cucumis sativus** and **Vicia faba.**

After this process the forming local and systemic symptoms on these plants were evaluated. Furthermore serological tests were performed in agar and for the electronmicroscopic examinations the virus isolates under consideration were purified. Moreover, in the present study the condition of transmission of the virus isolates by means of **Myzus persicae** and also their physical properties such as dilution end point and thermal inactivation point were determined.

As a result of all these investigations, the virus which is the causing agent of the disease was identified as a strain of cucumber mosaic virus.

## Reactions of Domestic Hybrid Tomato Cultivars to Infection by Tobacco Mosaic Virus

A. NOGAY[4]

In this study, twelve hybrid tomato cultivars from Antalya Greenhouse Research Institute were tested against Tobacco mosaic virus (TMV) and their reactions were recorded.

None of 12 cultivars investigated were ressitant to infection by virus However we could divide the cultivars in three as the least susceptible group (numbered I, IV and IX), more susceptible group (numbered II, III, V, VII and VIII) and the most susceptible group (numbered VI, X, XI and XII) on the basis of their response to infection.

The fruits from some cultivars were small, distorted in shape and colour compored with their none-inoculated plants. It was observed that the virus reduced the yield and quality of fruits produced.

It is concluded, from the results of the peresent study, that we should pay attention to allow the cultivars concerning the most susceptible group (included numbered VI, X, IX and XII7 be produced.

## Purification and Characterisation of Tomato Yellow Leaf Curl (TYLCV) Virus

M.A. YILMAZ[13] M. ÖZASLAN[13]

M.E. GÜLDÜR[13] S. BALOĞLU[13]

Tomato yellow leaf curl virus (TYLCV) is an economically important Tomato Virus disease in the Mediterranean Region of TURKIYE. All of the commercal tomato varieties are succeptible to this virus (2.3). TYLCV is a whiefly born virus. It can be seen on the tomato growing area along the Mediterranean sea shore. In this work, the virus was purified and the antiserum was obtained. The titre of antisera was determined 1/8. The 260/280 ratio was found to be 1.14 after partially purification. After the extraction of DNA 260/280 ratio reched up 2.2. It means that the final suspension has 1 µg/ml of viral DNA. In the Agarose minigel electroforesis, a single band was observed on the gel surface and viral DNA moved slowly. The virus has a twinned particle morphology (20x30 nm) and a 28000 da. mol. weight. It is a circular single stranded DNA genome characteristics of TYLCV.

## Resistance to Tomato Yellow Leaf Curl Virus (TYLCV) in Tomato

K. ABAK[12] M.A. YILMAZ[13] S. KESİCİ[7]
H. LATERROT[23] S. BALOĞLU[13]

Tomato Yellow Leaf Curl Virus (TYLCV) causes an important problems in tomato production in several countries. TYLCV was observed on tomato in 1974 in Çukurova and recently in Aegean region. TYLCV is transmitted by **Bemisia tabaci** Genn. (Cotton Whitefly).

Yield losses caused by this virus is not minimised through the contorl methods. Therefore this work was undertaken to control TYLCV in Tomato. Transmission of resistance properties against TYLCV from **Lycopersicon pimpinellifolium, L. peruvianum, L. hirsitum, L. chesmanii** to 4 of Commerial tomato varieties from in Turkey was carried out.

**L. peruvianum** "C.M.V. sel INRA", **L. hirsitum"** LA 1777" and "H 2" lines were found to be good enough in resistancy to TYLCV under our conditions. **L.pimpinellifolium** "Hirsute" and LA 121" lines shoved slight tolerance. In the other hand LA 1478 line was determined highly succeptible line.

At the present, the work came up to $BC_2$ generation in National and $BC_3$ generation in International breeding programme. The research will extend in 1991 and 1992 growing season.

## Development of a Sensitive Detection Technique for Tobacco Mosaic Virus (TMV) Based on Dot Blot Hybridization

T. TALAS[38] S. BALOĞLU[13] M.A. YILMAZ[13]
B. ÇIRAKOĞLU[28] E. BERMEK[27]

A sensitive technique was developed for the early detection of Tobacco Mosaic Virus (TMV). This technique is based on dot-blot molecular hybridization.

TMV and its genomic RNA extracted from tobacco leaves and they were applied onto nylon filter membrane through dot-blot system under vacuum and fixed to membrane by UV light. The samples were allowed to hybridize with a radioactively labelled synthetic oligonucleotide probe which is complementray to the sequence between nucleotides 5798-5819 in the TMV genome.

The effect of three different denaturation conditions were assayed in dilution series of virus and RNA samples. THe hybrids were detected by autoradioraphy, hereby, the limit of sensivity of the system found to be low as 90 picograms of TMV and 8.6 picograms of genomic RNA in the presence of 15 % formaldehyde used for denaturation.

This system was used for screening for tobacco plants and for the confirmation of the diagnosis in a parsley plant showing the symptoms of TMV.

## Investigations on the Detection of the Virus Infection of **Sinapis arvensis** L.

F. ERTUNÇ[2]

Sistemic mosaic infection on the **Sinapis arvensis** L. (Wild mustard) plants located at the borders of the orchard yard of Department of Horticulture, Faculty of Agriculture of Ankara University were detected and samples of infected foliage were taken and brought to the laboratory for the investigations. Virus was inoculated on to the different tobacco varieties, **Datura stramonium, Chenopodium amaranticolor, C. quinoa** and tomato and according to the simptoms produced on those plant, it was identified as lettuce mosaic virus (LMV). Only local reactions were detected on the newly tested plant varieties. Infected plant sap reacted only with LMV antiserum in Ouchterlony agar-gel double diffusion and microprecipitin tests. No reaction was observed after the dilution of 1/16 for infected sap and 1/64 for the antiserum in microprecipitin test. The physical properties of the virus in sap were detected as ditution and point $10^{-3}$ - $10^{-4}$ thermal inactivation point. 70 - 75°C and in-vitro 24-36 h. It has been detected with this research that **S.arvensis** is one of wild reservoir host of lettuce mosaic virus infection.

## Cucumber Vein Yellowing Virus in Cucurbitaceae in Çukurova Region

M.A. YILMAZ[13] M. ÖZASLAN[13] S. BALOĞLU[13]

Beside the Cucumber cultivation under plastic and glasshoues conditions, Melon (**Cucumis melo** L.) Watermelon (**Citrullus vulgaris** L.) and Squash (**Cucurbita pepo** L.) production in the field is becoming economically important cash crop in Çukurova Region.

Vein clearing vein yellowing, stunting and yield reduction were observed on the infected. **Cucumis sativus** L. "Coolgreen" and **Cucumis melo** L. "Hasan bey". The causal organism was rarely transmitted by mechanical inoculation to the test plants. The virus was easily transmitted by **Bemicia tabaci** Genn. to **Cucurbita pepo** L. "Sakız Kabağı" **C. sativus** L., **C. melo,** and **C. vulgaris** "Washington" **C. quinoa** will, **Datura stramonium** L. **Gompherena globosa** L. and Turkish tobaco did not show any symptom and virus was not recovered from these plants. Virus partially purified. 260/280 ratio was 1.17 Road shaped virus particles were obserwed under E.M.

Membrane feeding with **B. tabaci** Genn. was carried out and virus was transmitted to **C. sativus C. melo, C. pepo** and **C. vulgaris** by this method.

## The Detection of the Viral Agent Affecting Cauliflower and Cabbage Plants

S. ERKAN[18] D. EŞİYOK[17] B. ESER[17]

Cauliflower and cabbage are well-known and profitable vegetable crops extensively grown in many districts of Turkey. Recently it was found that the agent having virus-like symptoms became great problem in the production areas of both plants over especially Western parts of Turkey. It was observed that this agent did not produce any symptoms in the younger plants whereas it caused it pronounced signs of the disease in the older plants which were half-grown or later. The affected plants showed vein clearing on their young leaves and then, as the leaves matured a clearly defined green on yellow vein bandings were seen. The diseased leaves were puckered on distorted. Infected plants slightly stunted and the heads from these plants tended to be of poor quality. The symptoms on certain test plants the resluts from the physical properties gave the first indication that the disease in question was due to infection by a virus. Furthermore, the data from serological assays and the observations in electron microscope indicated that the agent on cauliflower and cabbage plants was cauliflower mosaic virus (CaMV).

## Detection of Grapevine Leafroll Virus Type I and III in Some Grapevine Varieties by Elisa

Y.Z. GÜRSOY[6]

In this study, the existence of Grapevine Leafroll asociated virus I and III serotypes (GLRV) were deteted in some grapevine varieties by ELISA. During the vegetation period, in the vineyards of Müşküle, Razakı, İrikara, Gamay, Papazkarası and Clairette grapevine varieties were observed in Yalova and Tekirdağ. In winter season, the dormant cuttings of selected vines were collected and stored 0-4°C.

The viral antigens were detected in the bark tissues of this cutting by ELISA. GLRV I and GLRV III serotypes were detected in different samples. All the collected samples of Gamay, Clairette, Müşküle and İrikara grapevine varieties were infected. Papazkarası and Razakı grapevine varieties samples were not infected except two samples.

## Detection of Grapevine Viruses and Their Effect on the Local Grapevine Varieties in Kahramanmaraş Region

M. ÖZASLAN[13] S. BALOĞLU[13] M.A. YILMAZ[13]

Kahramanmaraş region is an important grapevine production area in Turkey. Where the most consumed table grape varieties are "Maraş karası, Hönüsü, Maraş Kabarcığı, Yalangözü and Muhammediye". Nowadays those varieties are drastically showing yield reduction year after year because of virus affects.

There has been no research on the grapevine viruses in this area nobody knows, what virus is prevalent and what the effects of viruses on the grapevine. This research was initiated to observe and identify the viruses and determine the yield losses. At the begining of the work suspected samples which were showing virus symptoms were collected; 10 from Pazarcık, 5 from Türkoğlu, 10 from Elbistan, 10 from Afşin, 5 from Karabıyıklı, 10 from Dereli and 20 from the central town of Kahramanmaraş.

The ELISA test was used to detect the infection of Grapevine Fanleaf virus (GFLV), Grapevine Leaf Roll virus (GLRV, Type I and Type III), Grapevine Fleck virus (GFV) and Grapevine Nepo virus (GNV).

It was observed that 13 samples with GFLV, 5 with GFV, 18 with GNV and 42 with GLRV were infected. Most of the samples collected were infected with more than one virus.

The effect of these viruses on the yield were also compared and determined by quantitave methods. Viruses decreased the yield approximately 45 % and The yield losses has been increasing year after year.

## Researches on the Obtaining Virus-Free Plants in Strawberry

E. ÖZSEZGİN[16] N. GÖNÜLŞEN[16] K. ÖNAL[16]
N. ERCAN[16] S. ERKAN[18]

The aim of studies conducted by Aegean Agricultural Research Institute (AARI) located at Menemen, İzmir is to obtain virus-free plants of strawberry cultivars named Cruz, Tioga and Yalova-110 grown commercially in the Aegean Region; to establish healthy stock nurseries and to distribute this healthy material to the farmers. At first step, nematode-borne diseases such as Rasperry Ringspot Virus (RRV), Tomato Black Ring Virus (TBRV), Arabis Mosaic Virus (AMV), Strawberry Latent Ringspot Virus (SLRV) were indexed in three strawberry cultivars. In the result of indexing procedures, all three strawberry cultivars were found as free from nematode-borne diseases and clean stock nurseries were established with these healthy materials. Afterwards, the studies will continue on aphid-borne diseases.

## Studies on Incidence and Identification of Sharka Disease on Plums, Apricots And Peaches in Ankara Province

Ö. ELİBÜYÜK[2] G. ERDİLLER[2]

In this study, surveys as to where to find out the sharka virus on plums, apricots and peaches in the province of Ankara have been conducted.

According to the results obtained from the study, sharka disease has been detected through the observation of mechanically inoculated herbaceous plants and microprecipitation serological tests on plums and apricots only in the five districts of the province of Ankara. Besides that, inclusion bodies has been examined to support the obtained results, and in many cases, needle-like and granular inclusion bodies have been observed in the sharka infected parenchimatic tissues of plum and apricot fruits.

Since the presence of sharka virus has been determined in Turkey, it should be kept in mind that it is likely to be distributed thoughout the various parts of Turkey by the untrained nurserymen.

## Crinkly Leaf Virus Disease on Citrus in East-Mediterranean Region of Türkiye

N. ÖNELGE[13] A. ÇINAR[13]

The various virus diseases were observed in citrus groves in East-Mediterranean region where consisted of 57.3 percent of the citrus plants in Turkiye. Of these viruses citrus crinkly leaf virus (CCLV) became epidemic in the last 2 or 3 years.

The primary symptoms of CCLV in field trees of lemon, sour orange, mandarin, grapefruit, tangelo are seen in the leaves, which show distorted, puffed or puckered leaf segments. The disease is especially widespread on lemon varieties.

Transmission of crinkly leaf virus by man via infected budwood or mechanical means are the primary maens of spread in the East-Mediterranean region.

The characteristic symptoms of CCLV were observed on the indicator plants of sour orange, rough lemon, Mexican lime, Pineapple sweet orange inoculated with buds and bark patches derived from diseased trees in the field.

Serological test of ELISA was used for index of citrus infectious variegation virus. But all the tests gave the negative result. Additionally, the herbaceous host plants such as cowpea and bean were used as indicator plant. All the tests were used to differ the three relative citrus virus of citrus crinkly leaf, citrus infectious variegation and citrus leaf rugose from eachother, and finally suggested that the pathogen in the region should be CCLV.

## Hybridization Analysis With Some Clones Prepared from Citrus Tristeza Virus (CTV)

S. AÇIKGÖZ[5] R. F. LEE[40]

Ten clones containing cloned cDNA sequence of citrus tristeza virus (CTV) were labeled with 32p CTV using nick translation. The RNAs extracted from bark tissues of enfected plants with CTV isolates were blotted on nitrocellulose membrane and hybridized with 32p-labeled ten cDNA clones.

As a result only two clone (P6C4 and P6C7) gave positive reaction with CTV isolates. After that, it will be possible that two clone can be used on CTV genome study.

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