

مكافحة مرضى العفن الأسود وعفن الرقبة فى البصل باستخدام بعض المستحضات
الكيميائية والعلاج التجفيفى

محمد محمد عمار⁽¹⁾ ، نفيسة عبد العظيم الصيفى⁽¹⁾ ، نجوى على إبراهيم⁽²⁾ ،
هالة فتحى البابلى⁽²⁾

⁽¹⁾ قسم النبات الزراعى - كلية الزراعة - شبين الكوم - جامعة المنوفية - مصر .

⁽²⁾ معهد بحوث أمراض النباتات - مركز البحوث الزراعية - الجيزة - مصر .

**CONTROL OF ONION BLACK MOULD AND NECK-ROT
DISEASES USING SOME CHEMICAL INDUCERS AND CURING
PERIOD**

**M. M. Ammar⁽¹⁾, Nafisa A. El-Saify⁽¹⁾, Nagwa A. Ibrahim⁽²⁾
and Hala F. El-Bably⁽²⁾**

⁽¹⁾ Agricultural Botany Dept., Fac. of Agric., Minoufiya Univ., Egypt.

⁽²⁾ Plant Path. Res. Inst., Agric. Res. Center, Giza, Egypt.

(Received: May 6, 2012)

ABSTRACT: *Spraying onion plants cv. Giza 20 under field conditions either 40 or 40 and 20 days before harvesting individually with salicylic acid (SA), Oxalic acid (OA) and Potassium monohydrogen phosphate as chemical inducers with different concentrations controlled effectively the storage diseases i.e., black mould and neck rot attacking onion bulbs. SA with 8 mM was the best for controlling both storage diseases on onion bulbs, where its effect was nearly equal to the effect of Ridomil fungicide. Also, spraying onion plants cv. Giza 20 with the tested chemical inducers as twice applications significantly improved the store-ability of onion bulbs. Moreover, curing onion bulbs for 1 – 3 weeks directly after harvesting, significantly decreased the incidence of both diseases with superiority of increasing the curing period. High significant reduction of total soluble sugars (TSS) was observed in response to the application of the inducers and / or Ridomil. On the other hand, peroxidase, polyphenol oxidase and chitinase activities were more higher in the treated plant bulbs than those of nontreated control.*

Key words: *Black mould, neck-rot, Aspergillus niger, Botrytis allii, chemical inducers, curing, sugars and enzymes.*

إستخدام التصميم الإحصائي Central Composite Design للوصول إلى
الظروف المثلى لإنتاج الحمض ١٨ بيتا جليسررहितيك باستخدام الخميرة
تريكوسبورون جيروفيسيبي

أشرف فرج الباز حواس^(١) ، يسرية محمد حسن شتية^(٢) ، محمود عبد الحميد السمان^(١) ،
محمد محمد عمار^(٣) ، إبراهيم عبد المقصود إبراهيم^(١)

^(١) معهد بحوث الهندسة الوراثية والتكنولوجيا الحيوية - جامعة المنوفية - مدينة السادات.

^(٢) قسم الميكروبيولوجي - كلية العلوم - جامعة عين شمس - القاهرة.

^(٣) قسم النبات الزراعي - كلية الزراعة - جامعة المنوفية - شبين الكوم.

**CENTRAL COMPOSITE DESIGN FOR THE OPTIMIZATION OF
18B-GLYCYRRHETINIC ACID PRODUCTION BY
TRICHOSPORON JIROVECII**

**A. F. El-Baz⁽¹⁾, Y. M. Shetaia⁽²⁾, M. A. Al-Saman⁽¹⁾, M. M.
Ammar⁽³⁾
and I. A. Ibrahim⁽¹⁾**

⁽¹⁾ Genetic Engineering and Biotechnology Research Institute (GEBRI), Minoufia University, Sadat City.

⁽²⁾ Microbiology Department, Faculty of Science, Ain Shams University, Cairo.

⁽³⁾ Plant Pathology, Faculty of Agriculture, Minoufia University, Shebin El-Kom.

(Received: Jun. 3, 2012)

ABSTRACT: *In our previous study Plackett-Burman design was used to select the most effective variables for a high production of 18 β -glycyrrhetic acid (GA). In this work the Central Composite Design (CCD) combined with Response Surface Methodology (RSM) were used to optimize the conditions for GA production from glycyrrhizin (GL) by the yeast *Trichosporon jirovecii*. The used independent variables were initial pH, incubation time, glucose, yeast extract and corn steep liquor. A mathematical model that is able to predict the effect of independent variables towards the responses was established by multiple regression analysis. Analysis of variance was used to determine the adequacy between the model and experimental value. The results indicated that the model was semi-adequate with satisfactory of the RSquare (0.548). It was fairly good experimental model fits the actual data. Using this design a high conc. (158 mg) of GA was produced from 0.6 g of crude GL.*

Key words: *Central Composite Design, Response Surface Methodology, Trichosporon jirovecii, glycyrrhizin, 18 β -glycyrrhetic acid*

التحول الحيوي للجليسرهيذين إلى الحمض 18 بيتا جليسرهيدينك باستخدام الخميرة
تريكوستورون جيروفيسيائي باستخدام تصميم بلاكت - بورمان

أشرف فرج الباز حواس⁽¹⁾ ، يسرية محمد حسن شتية⁽²⁾ ، محمود عبد الحميد السمان⁽¹⁾ ،
محمد محمد عمار⁽³⁾ ، إبراهيم عبد المقصود إبراهيم⁽¹⁾

⁽¹⁾ معهد بحوث الهندسة الوراثية والتكنولوجيا الحيوية - جامعة المنوفية - مدينة السادات.

⁽²⁾ قسم الميكروبيولوجي - كلية العلوم - جامعة عين شمس - القاهرة.

⁽³⁾ قسم النبات الزراعي - كلية الزراعة - جامعة المنوفية - شبين الكوم

**-BIOTRANSFORMATION OF THE GLYCYRRHIZIN INTO 18β
GLYCYRRHETINIC ACID BY *TRICHOSPORON JIROVECII* USING
A PLACKETT-BURMAN DESIGN**

**A. F. El-Baz⁽¹⁾, Yousria M. Shetaia⁽²⁾, M. A. Al-Saman⁽¹⁾, M. M.
Ammar⁽³⁾
and I. A. Ibrahim⁽¹⁾**

⁽¹⁾ Genetic Engineering and Biotechnology Research Institute (GEBRI), Minoufia University, Sadat City.

⁽²⁾ Microbiology Department, Faculty of Science, Ain Shams University, Cairo.

⁽³⁾ Plant Pathology, Faculty of Agriculture, Minoufia University, Shebin El-Kom.

(Received: Jun. 3, 2012)

ABSTRACT: Glycyrrhizic acid is a molecule composed of a hydrophilic part, two molecules of glucuronic acid, and a hydrophobic fragment, glycyrrhetinic acid. Which is 50 times as sweet as sugar. GL is transformed into glycyrrhetinic acid, which has several advantages over GL. In the present study, yeast *Trichosporon jirovecii* was screened for 18β-glycyrrhetinic acid (GA) production using crude glycyrrhizin (GL) extracted from licorice roots. Nine independent factors including initial pH, temperature, concentration of GL as an inducible, addition time of GL, incubation time, glucose, yeast extract, corn steep liquor and aeration were surveyed and effective variables for GA production were determined using a Plackett-Burman design. Results analysis showed that incubation time (7 days), pH (6), yeast extract (0.3 %), glucose (1.0 %) and corn steep liquor (0.8 %) were the most effective variables for the highest level of GA production respectively.

Key words: *Trichosporon jirovecii*, glycyrrhizin, 18β-glycyrrhetinic acid, Plackett-Burman design.

***INTERACTION EFFECT BETWEEN FUSARIUM OXYSPORUM,
RHIZOCTONIA SOLANI AND MELOIDOGYNE SPP. ON POTATO PLANTS***

E. Z. Khalifa(1), M. M. Ammar(1), E. M. Mousa(1), S. L. Hafez(2) and M. Z. El-Shennawy(1)

(1) Agricultural Botany Dept., Fac. of Agric., Minoufiya Univ., Egypt, (2) College of Agric., Univ. of Idaho, USA ,,

ABSTRACT:

The effect of three pathogenic organisms, *Fusarium oxysporum*, *Rhizoctonia solani* and mixed group of *Meloidogyne* spp. (*M. javanica* and *M. incognita*) separately or in a combination on potato plant cv. Nicola was studied under greenhouse conditions. The combined infection with mixed *Meloidogyne* spp. plus tested fungi resulted in significant reduction in all nematode parameters, No. of J2 / soil, No. of developmental stages, No. of Females, No. of egg masses and reproduction factor compared with nematode treatment only. Disease severity of *Fusarium* wilt was greatly increased when mixed *Meloidogyne* spp. and *R. solani* were combined with *F. oxysporum* compared with wilt fungus treatment only. However, significant increase was observed on black scurf, stem canker diseases and infected tuber when mixed *Meloidogyne* spp. and *F. oxysporum* were combined with *R. solani* compared with *R. solani* treatment only. The interaction between the tested pathogenic organisms was more effective on reduction plant growth parameters reduction than each of these organisms separately.

Key words: *Fusarium oxysporum*, *Rhizoctonia solani*, *Meloidogyne* spp., *Fusarium* wilt, black scurf, stem canker, p

INTEGRATED CONTROL OF TOMATO ROOT-ROT DISEASE

G.A. Amer, M.M. Ammar, T.H. Abd El-Moity, Enas A. Khalaf-Allah
Dept. Agric. Botany, Fac. of Agric. Minufiya University, Dept. Agric. Botany, Fac. of
Agric. Minufiya University, Agric. Res. Center, (ARC), Giza, Egypt, Agric. Res.
Center, (ARC), Giza, Egypt

ABSTRACT:

Fusarium oxysporum, f.sp. *lycopersici*, *F. solani*, *Rhizoctonia solani* and *Pythium ultimum* were the major soil-borne pathogens isolated from tomato plants showing wilt, damping-off and root-rot diseases. *Trichoderma harzianum*, *Bacillus subtilis*, *B. marinus* and *B. firmus* were isolated from the rhizosphere of healthy tomato plants. These isolates showed, in vitro; good antagonistic effects against the previous four pathogens; where *T. harzianum* overgrew on the pathogenic isolates and inhibition zones were observed between *Bacillus* spp. and different pathogens. Under greenhouse and artificial inoculation conditions; the tested biocontrol agents significantly decreased root-rotted plants and increased survivals. The four tested tomato cultivars i.e., Super Strain B, Castle Rock, Floradade and 448 Al-Qudse were susceptible to all tested pathogens. However, Al-Qudse cultivar was less susceptible than the other cultivars. Barley was the best carrying material for *T. harzianum* while wheat bran favoured for *B. subtilis*. Cultivation of the least susceptible cultivar (Al-Qudse) treated with either *T. harzianum* or *B. subtilis* before planting in artificially infested soil showed successful control integration for tomato root-rot disease.

Key words: Tomato root-rot, Cultivar resistance, Biological control, *Bacillus subtilis*, *Trichoderma harzianum*,

***BIOLOGICAL CONTROL AND DETECTION OF FUSARIUM WILT DISEASE
IN "SWEET PEPPER" CAUSED BY FUSARIUM OXYSPORUM F. SP.
LYCOPERSICI in Egypt***

M.M. Ammar, Fatma A. Fouad, and Enas A. Khalf Allah,
Agric. Botany Dept., Faculty of Agric., Minufiya Univ., Plant Pathol. Res. Inst. Agric.
Res. Center, Giza, Egypt.,

ABSTRACT:

This research was conducted at Sakha Agricultural Research Station under greenhouse and field conditions. Fusarium wilt disease of pepper caused by *Fusarium oxysporum* [FO]. Sixty isolates of [FO] were isolated from different locations in Egypt. The virulence of four isolates of the causal organisms [FO] were examined. The obtained results showed different values of disease severities, however isolate no. (56) which identified as *Fusarium oxysporum* f. sp. *lycopersici* [FOL] was the most virulent one showing the highest values of disease severities during growth stages of pepper. The pathogenicity of the four isolates of *F. oxysporum* f.sp. *capsici* on California Wonder 300 variety showed that the most degree of wilt diseases incidence at the late period of planting pepper crop. Treated pepper plants by mixture of *Trichoderma* spp. (*T. harzianum*, *T. viride* and *T. hamatum*), *Pseudomonas fluorescens* and *Bacillus subtilis* [commercial bioagent (omega)] compared with fungicide (Rhizolex-T-50%) were highly effective against *Fusarium* wilt disease, under greenhouse condition. On the other hand, under field condition, the different bioagent showed different degrees of efficacy against [FOL], while it was considered as main causal organisms of wilt on pepper. Antagonistic of microorganisms gave the highest effect to increase the percentage of survival plants and led to reduction in the efficacy of *Fusarium* wilt incidence during all growth stages of pepper crop. Generally, results showed that using mixture of three *Trichoderma* isolates gave the highly significantly reduction of disease incidence and increasing in pepper yield. Significant reduction of disease incidence was observed between this treatment either under artificial or natural infested soil compared with other treatments. Data obtained show that positive correlation between adding doses of antagonists and disease incidence reduction than adding one dose of the same antagonists at planting time. Furthermore, adding different fungal antagonistic at any treatment led to significant reduction in wilt incidence and increased pepper yield compared with either bacterial or fungicidal treatment. Protein analysis (extract protein) from pepper plants was used to detect *Fusarium oxysporum* f.sp. *lycopersici* [Fol] in Sweet Romy pepper cultivar. Also UPGMA cluster analysis was detected in two clusters, which were indicated that the enhanced resistance of pepper plants to the antifungal effect during growth stages of pepper crop.

Key words: pepper, biological control, *Trichoderma* spp, *Fusarium oxysporum*, detection, UPGMA, chemical control,

SOYBEAN ROOT-ROT MANAGEMENT USING SOME INDUCER RESISTANCE COMPOUNDS

M. M. Ammar¹, M. E. Mahdy¹, I. A. Ismail², Hala M. R. El-Gindy²
¹ Agricultural Botany Dept., Fac. of Agric., Minoufiya Univ., Egypt., ² Plant Path.,
Res. Inst., Agric., Res. Center, Giza, Egypt. ,,

ABSTRACT:

: *Fusarium solani*, *Rhizoctonia solani* and *Macrophomina phaseolina* were the dominant associated fungi with soybean root-rotted seedlings collected from Giza, El-Menia, Minoufiya and Sharkia governorates. Pathogenicity test experiments cleared that *F. solani* and *R. solani* were more virulent to soybean cultivar Giza 21, while *M. phaseolina* was less virulent. Dipping soybean seeds of Giza 21 and Giza 35 cultivars for 30 second before one hour of planting, in six different inducers significantly reduced seedling damping-off and root-rot. Oxalic acid showed the best effect while neem oil was the least effective one, under greenhouse conditions. Oxalic and Salicylic acid treatments increased the survived plants, as it reached 97.4% under field conditions. Application of the inducers significantly improved both growth and yield parameters of both tested soybean cultivars. Peroxidase, polyphenol oxidase and chitinase activities were significantly higher, than control, in response to the application of different inducers and the fungicide Rizolex-T to Giza 21 soybean seeds planted in artificially infested soil with *R. solani*. Generally, Rizolex-T, Oxalic and Salicylic acid were the most efficient treatments, while Neem oil showed the lowest effect. Key words: Root-rot, soybean, *Rhizoctonia solani*, *Fusarium solani*, *Macrophomina phaseolina*, chemical inducers, Rizolex-T and defence related enzymes.

Key words: Root-rot, soybean, *Rhizoctonia solani*, *Fusarium solani*, *Macrophomina phaseolina*, chemical inducers,