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Review

Summary of the Study Response of Some Wheat Pathogenic Fungi to Chemical and Biological Control

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A study was conducted efficiency of chemical and biological control against root rot fungi: *Drechslera biseptata* and *Fusarium moniliforme* which attack wheat. The chemical control included the systemic fungicidel vitavax. The biological control included: the biocide plant guard (which consists of spores of *Trichoderma harzianum*) and the biocontrol agent T. viride. [1] The effect of chemical and biological control on the two pathogenic fungi was studied in vitro and in vivo after carrying out pathogenicity test. In vitro studies included: linear growth, dry weight, spore production and germination. In vivo studies included seedings emergergence; disease in cidence growth criteria as well as carbohydrates, phenolic compounds and proteins contents of root and shoot systems in addition to photosynthetic pigments of leaves.

The Experimental Results can be Briefly Summarized in the Following Points

A- Chemical and biological control of *D. biseptata* and *F. moniliforme* in vitro showed that:

1- Fungicide and biocides were efficient against both pathogens; some of them had fungicidal effects while the others had fungistatic effects.

2- *F. moniliforme* was more sensitive than D. biseptata to fungicide and biocides.

3- Vitavax, plant- guard and non-sterile culture filtrate of T. Viride prevented completely the growth and sporulation of *F. moniliforme* at the higher concentrations.

4-Sterile culture filetrate of *T. viride* had only inhibitory effect on growth and sporulation of *F. moniliforme.*

5- Biocides (plant-guard and non-sterile culture filtrate of Trichoderma viride) prevented the growth and sporulation of *D. biseptata* at the higher concentrations.

6- Vitavax and sterile culture filtrate of T. viride had only inhibitory effect on growth and sporulation of *Drechslera biseptata*.

7- The fungicide vitavax inhibited and prevented spore germination of both fungi, whereas all the biocides showed stimulatory effect.

8- Effect of fungicide and biocides on fungi depended upon the types of antifungal agent and its concentration, as well as the type of the pathogen and the growth criterion.

9- Inhibition of growth criteria was directly correlated to concentration of fungicide or biocide.

10- Some morphological changes to conidia of *Fusarium moniliforme* when treated with non-sterile culture filtrate of T. viride were observed. 11- Biological control especially plant-guard and non-sterile culture filtrate of T. viride were more efficient against both pathogenic fungi than chemical control (vitavax).

B- Pathogenicity test revealed that both pathogens had the ability to attack wheat seedlings and caused crown and root rot disease. Disease incidence was directly correlated to inoculum concentration. On the other hand, seedlings emergence and growth

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criteria of root and shoot systems were inversely proportional to inoculum concentration.

C- Chemical and biological control in vivo showed that:

1- The two pathogens had the ability to:

* Decrease and delate seedlings emergence.

* initiate some disease symptoms such as brown discolorations at the stem base and the upper part of the root, decrease lateral roots, as well as yellowing and death of some seedlings.

*decrease photosynthetic pigments (chlorophylls A and B and carotenoides) contents of leaves.

* inhibit growth and decrease carbohydrates, phenolic compounds and proteins contents of root and shoot systems.

2- *Drechslera biseptata* was more virulent than *Fusarium moniliforme*.
3- Root system was more susceptible to infection than shoot system.

4- Each pathogen had certain mode of action:

a- F. Moniliforme decreased seedlings emergence and photosynthetic pigments more than *D. biseptata.*

b- D. biseptata inhibited growth criteria and decreased carbohydrates, phenolics and proteins contents of root and shoot systems more than *F. moniliforme.*

5- In absence of pathogens, fungicide and biocides had no significant effect on seedlings emergence. However, they stimulated growth criteria and the biosynthesis of carbohydrates, phenolic compounds and protein contents of root and shoot systems, in most treatments.

6- The fungicide and the biocide were effective in controlling both pathogens, and they had the ability to:

a- increase seedlings emergence.

b- Decrease disease incidence.

c- Improvem all growth criteria of root and shoot systems.

d- Stimulate the biosynthesis of photosynthetic pigments.

e- Stimulate the resistance of the host by increasing the accumulation of carbohydrates, phenolic compounds and protein contents of seedlings.

7- The antifungal compounds were effective in controlling *F. moniliforme* than *D. biseptata* as well as in vitro.

8- The bioagent Trichoderma viride was the best one in controlling the disease, followed by T. viride + vitavax and plant-guard + vitavax.

9- There was a relationship between the control of pathogens in vitro and in vivo.

Reference

1. Amal Ali Al-Mousa (2006) A Master Thesis entitled Response of Some Wheat Pathogenic Fungi to Chemical and Biological Control.