



جامعة البصرة – كلية الزراعة  
قسم وقاية النبات

# Biological control of plant diseases

by

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# Where do we get the Biological Control factor?

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Farsit: insects ▶

1 - Infected insects ▶

2- Soil ▶

3 – Air ▶

4 - The plant ▶

Second: plants ▶

1- Healthy plants and their waste ▶

2- During isolation for pathogens ▶

3- Soil and the plant parts embedded in it ▶

4 - plant seeds ▶

5 - Air ▶

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Third: the Weeds ▶

1 - Infected weeds ▶

2 - weeds seeds ▶

3 – soil ▶

Fourth: nematodes ▶

1 - infected nematodes ▶

2- Soil ▶

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## كيفية ادامة عامل المقاومة الحيوية


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How to maintain the biological control factor ▶

After isolating the biological control factor, it is purified ▶ by the single cell method, then it is diagnosed by sex, type and even strain if necessary. A copy of the isolation is preserved after verifying its ability in biological resistance. The following studies are conducted on another copy of the same isolation.

First: the optimum conditions for the growth and ▶ reproduction of the isolate in addition to the highest and lowest of those conditions such as temperature, humidity, pH, nutritional requirements.....etc

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## ثانيا : كيفية تقديم عامل المقاومة الاحيائية الى حيز التطبيق

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Second: How to put the biological resistance factor into practice |

Viruses: Searching for vectors of these viruses, so that it is preferable to find vectors that are slightly affected by viruses or not affected in order to exercise their activity and are located near the pest and cause infection, provided that the vectors do not have economic effects, and some insects, for example, who deal with the same members of their group as ants can be infected. And the ground, such insects are in contact with each other, which can easily transmit viruses to healthy insects

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## 2- Bacteria and fungi ▶

Obligate parasites can deal with obligate parasites like ▶  
viruses. As for facultative saprophytes, their nutritional requirements can be studied and synthetic medium or selective medium can be used to grow and multiply them in order to use them with concentrations affecting the pest.





► ويشترط في الوسط الذي يحمل عليه عامل المقاومة الاحيائية ما يلي :

► أ – سهل التحضير ولا يحتاج الى اجهزة ومواد معقدة

► ب – رخيص الثمن وغير مكلف لكي يكون المبيد الاحيائي رخيص الثمن وذات جدوى اقتصادية

► ج – غير قابل للتلف بسرعة ولا يتلوث بأحياء اخرى

► د – ان ينمو عليه عامل المقاومة الاحيائية بسهولة وغازارة ويكون جميع الاطوار المهمة في عملية المكافحة

► ه – امكانية تحضير ذلك الوسط بأنماط مختلفة كالأوساط السائلة والمساحيق

► و – امكانية استخدام الوسط بسهولة حقليا او ميدانيا بوسائل الرش او التعفير التقليدية المعروفة



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- In the medium on which the biological resistance factor is carried, the following are required:
- A - It is easy to prepare and does not require complex equipment and materials
  - B - cheap and inexpensive in order for the biocidal to be cheap and economically feasible
  - C - It is not perishable quickly and does not contaminate with other organisms
  - D - that the biological control factor grows easily and abundantly and all the important phases in the control process are present
  - E - The possibility of preparing that medium in different styles, such as liquid and powder media
  - F- The possibility of using the medium easily in the field or in the field by the well-known traditional spraying or fogging methods
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▶ **ثالثا : المحافظة على فعالية عامل المقاومة الحيوية عن طريق :**

▶ **أ – الاحتفاظ بالعزلة الاصلية لعامل المقاومة الحياتية**

▶ **ب – اختبار القدرة الامراضية لعامل المقاومة الحيوية للافه بين فترة**

**واخرى للتأكد من فعاليتها**

▶ **ج – امكانية اجراء طفرات وراثية على عامل المقاومة الحيوية لربما**

**الحصول على عزلة اكثر فعالية من العزلة الاصلية**

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Third: Maintaining the effectiveness of the biological resistance factor through: ▶

A - Maintaining the original isolation of the biological resistance factor ▶

B - Testing the pathogenicity of the biological resistance factor of the pest from time to time to ensure its effectiveness ▶

C - The possibility of making genetic mutations on the biological resistance factor, perhaps obtaining a more effective isolate than the original isolate ▶

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▶ رابعا : دراسة تأثير المبيدات المستخدمة مع عامل المقاومة الحيوية واختيار التي لا تؤثر على عامل المقاومة الحيوية لكي تدخل معها في برامج مكافحة المتكاملة

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▶ كيف يكون عامل المقاومة الحياتية ناجحا

▶ 1 – ان يكون متخصص Specific لكي لا يؤثر على التوازن الاحيائي ومن المفضل ان يؤثر على اكثر من افة شرط ان لا يؤثر على الاحياء المفيدة

▶ 2 – السرعة في النمو وادمة نفسه تحت ظروف مختلفه وان يبقى حيا في محيط تواجد الافة بشكل رمي او عوامل غير مهمة اقتصاديا

▶ 3 – ان يؤثر على الافة بأكثر من طريقة كالتطفل او افراز بعض المواد التي تؤثر على الافة

▶ 4 – يؤثر في جميع اطوار الافة

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Fourth: Studying the effect of the pesticides used with the biological resistance factor and selecting those that do not affect the biological resistance factor in order to be included with it in the integrated control programs. ▶


How is the life resistance factor successful? ▶

1 - It should be specific so that it does not affect the biological balance. It is preferable that it affects more than one pest, provided that it does not affect the beneficial organisms ▶

.2 - The speed of growth and self-perpetuation under different conditions and to remain alive in the vicinity of the presence of the pest in the form of throwing or factors that are not economically important ▶

3- It affects the pest in more than one way, such as intrusion or the secretion of some substances that affect the pest ▶  
4- It affects all phases of the lesion

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5- It should be less affected or not affected by other organisms in the vicinity of its use ▶

6- It must be genetically stable and unchanged so that its ability as a biological resistance factor can be preserved ▶

7- It has the ability to adapt to different environments and climates ▶

8- It should not affect the health of humans and animals, as well as their food products



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Pests against which biological resistance agents are applied ▶

First: Pests that cause great economic losses, especially those that appear on important strategic crops, which constitute a large part of the country's economy ▶

Second: the pests that enter the country for the first time, as they spread quickly and infect many families as a result of the absence of their vital enemies. Among the signs of the new pest are the following: ▶

Third - The absence of natural enemies of that pest because of its survival in the original home of the pest ▶

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Fourth: Pests that show rapid resistance to chemical pesticides ▶

Fifth: Pests that have not been affected by pesticides or have little effect on pests, such as yard disease on wheat, which is caused by the fungus *Gaumannomyces graminis* var. *tritici* ▶

Sixth: Pests that are difficult to resist chemically, such as tree-stem diggers ▶

Seventh: Pests that have effective and effective biological enemies and can be isolated and reared easily. They can be used because they are more economic than using pesticides and less polluting. ▶

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