Integrated Pest Management (IPM)
المكافحة المتكاملة للآفات الزراعية

By
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What is IPM? مفهوم المكافحة الحيوية

- In agriculture, Integrated Pest Management (IPM) is a pest control strategy that uses an range of complementary methods: natural predators and parasites, pest-resistant varieties, cultural practices, biological controls, various physical techniques, and pesticides as a last resort. It is an ecological approach that can significantly reduce or eliminate the use of pesticides.

- المكافحة المتكاملة للآفات الزراعية
- هيّ نظام او استراتيجية تستخدم للسيطره على اللآفات الزراعية وهذا النظام يستخدم مجموعة من الطرق مثل:
- استخدام الأصناف المقاومة من البذور الزراعية والأشجار المثمرة,
- أو استخدام الطرق المكانيكية,
- أو استخدام الأعداء الحيوية المحلية وغير المحلية,
- ويمكن استخدام المكافحة الكيماوية فقط عندما تدعوالحاجة إليها.

Integrated Pest Management is the use of multiple tactics in a compatible manner to maintain pest populations at levels below those causing economic injury while providing protection against hazards to humans, domestic animals, plants, and the environment.

- **Integrated** means that a broad interdisciplinary approach is taken using scientific principles of plant protection to fuse into a single system a variety of management strategies and tactics. This integration of techniques must be compatible with the total plant production and marketing systems.
- **Pests** include all biotic agents (i.e., insects, mites, nematodes, weeds, bacteria, fungi, viruses, parasitic plants, and vertebrates) that adversely affect plant production.
- **Management** is the decision making process to control pest populations in a planned, systematic way by keeping their numbers or damage at economically acceptable levels.

Cont.

- The IPM approach can be applied to both agricultural and non-agricultural settings, such as the home, garden, and workplace. IPM takes advantage of all appropriate pest management options including, but not limited to, the sensible use of pesticides. In contrast, *organic* food production applies many of the same concepts as IPM but limits the use of pesticides to those that are produced from natural sources, as opposed to synthetic chemicals.

How IPM works

كيفية تطبيق المكافحة المتكاملة للآفات

- An IPM regime can be quite simple, or sophisticated enough to be a farming system in its own right. The main focus is usually insect pests, but IPM may includes diseases, weeds, and any other naturally occurring biological crop threat.
- An IPM system is designed around six basic components

1- Acceptable pest levels.
2- Preventive cultural practices.
3- Monitoring.
4- Mechanical controls
5- Biological controls.
6- Chemical controls:

كيفية تطبيق المكافحة المتكاملة للآفات

إستخدام نظام المكافحة المتكاملة للآفات قد يكون بسيط أو قد يحتاج الى إستخدام طُرق متطورة ليكون جُزء لا يتجَزء من نظام الزراعة الحديثة. يتركز نظام المكافحة المتكاملة عادة على لآفات الحشرية، ولكن المكافحة المتكاملة للآفات يمكن إستخدامها في مكافحة الأدغال والأمراض وغيرها من العوامل بيولوجية التي التي تهديد المحاصيل الزراعية

إن وضع برنامج للمكافحة الحيوية يتطلب الحصول على العديد من المعلومات الأساسية منها

1 - تحديد مستوى الإصابة
2 - الممارسات الوقائية
3 - الرصد
4 - إستخدام المقاومة الميكانيكية
5 - إستخدام المكافحة البيولوجية.
6 - إستخدام المواد الكيميائية:

1- Acceptable pest levels: 1- تحديد مستوى الإصابة

- Before taking any pest control action, IPM first sets an action threshold, a point at which pest populations or environmental conditions indicate that pest control action must be taken. Sighting a single pest does not always mean control is needed. The level at which pests will either become an economic threat is critical to guide future pest control decisions. The emphasis is on control, not eradication. IPM holds that wiping out an entire pest population is often impossible, and the attempt can be more costly, environmentally unsafe, and all-round counterproductive than it is worth. Better to decide on what constitutes acceptable pest levels, and apply controls if those levels are exceeded.

Cont. 1- Acceptable pest levels:

- The emphasis is on *control*, not *eradication*. IPM holds that wiping out an entire pest population is often impossible, and the attempt can be more costly, environmentally unsafe, and all-round counterproductive than it is worth. Better to decide on what constitutes acceptable pest levels, and apply controls if those levels are exceeded.

2- Prevention **Preventive cultural practices:**

- **As a first line of pest control, IPM programs work to manage the crop, lawn, or indoor space to prevent pests from becoming a threat. In an agricultural crop, this may mean using cultural methods, such as rotating between different crops, selecting pest-resistant varieties, and planting pest-free rootstock. These control methods can be very effective and cost-efficient and present little to no risk to people or the environment.**

3- Monitor and Identify Pests

- **Not all insects, weeds, and other living organisms require control. Many organisms are harmless, and some are even beneficial. IPM programs work to monitor for pests and identify them accurately, so that appropriate control decisions can be made in conjunction with action thresholds. This monitoring and identification removes the possibility that pesticides will be used when they are not really needed or that the wrong kind of pesticide will be used.**

beneficial insects in your garden

Ground beetle

Lady beetle adults

Bee on plum tree with pollen

Hoverflies or flower flies

Crab spider

Rove beetles

Cont. Monitor and Identify Pests

- **Once monitoring, identification, and action thresholds indicate that pest control is required, and preventive methods are no longer effective or available, IPM programs then evaluate the proper control method both for effectiveness and risk. Effective, less *risky* pest controls are chosen first, including highly targeted chemicals, such as pheromones to disrupt pest mating, or mechanical control, such as trapping or weeding. If further monitoring, identifications and action thresholds indicate that less risky controls are not working, then additional pest control methods would be employed, such as targeted spraying of pesticides. Broadcast spraying of non-specific pesticides is a last resort.**

Manage and identify insects, mites, diseases, nematodes, weeds, and vertebrates

Pests of Homes, Structures, People and Pets

A- Pests that sting, bite, or injure

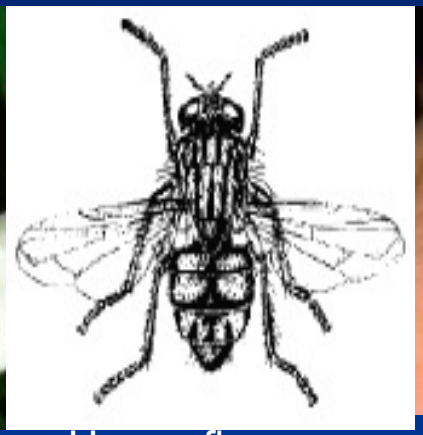
B- Wood-destroying, food, fabric, and nuisance pests

C- Vertebrate pests—Birds, mammals, and reptiles

Pests of Homes, Structures, People, and Pets

- Bed bug

Bee

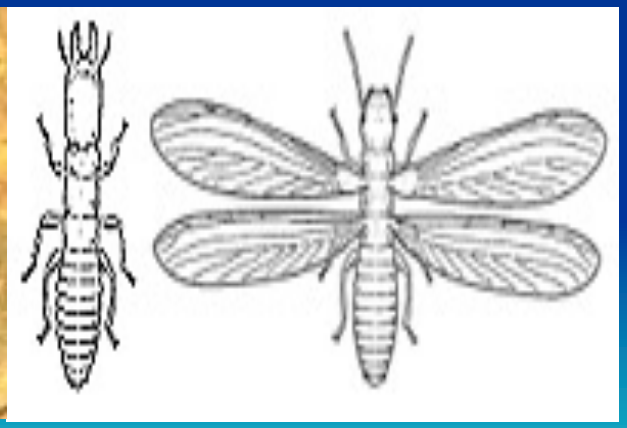


House fly

Cat Fleas

- Carpet beetles

Millipedes and Centipedes



Termites

Pests in Gardens and Landscapes

House mouse

Rats

Pigeons

Rabbits

Deer

Lizards

4- Mechanical controls

- If a pest reach an unacceptable level, mechanical methods are the first options to consider. They include simple hand-picking, erecting insect barriers, using traps, vacuuming, and tillage to disrupt breeding.

Mechanical controls

Air Cleaners

Yellow sticky trap

Mice trap

Ants trap

Copper Blocker

Electronic Pest Control

UV Bug Zapper

Flying insect

Using a Vacuum Cleaner

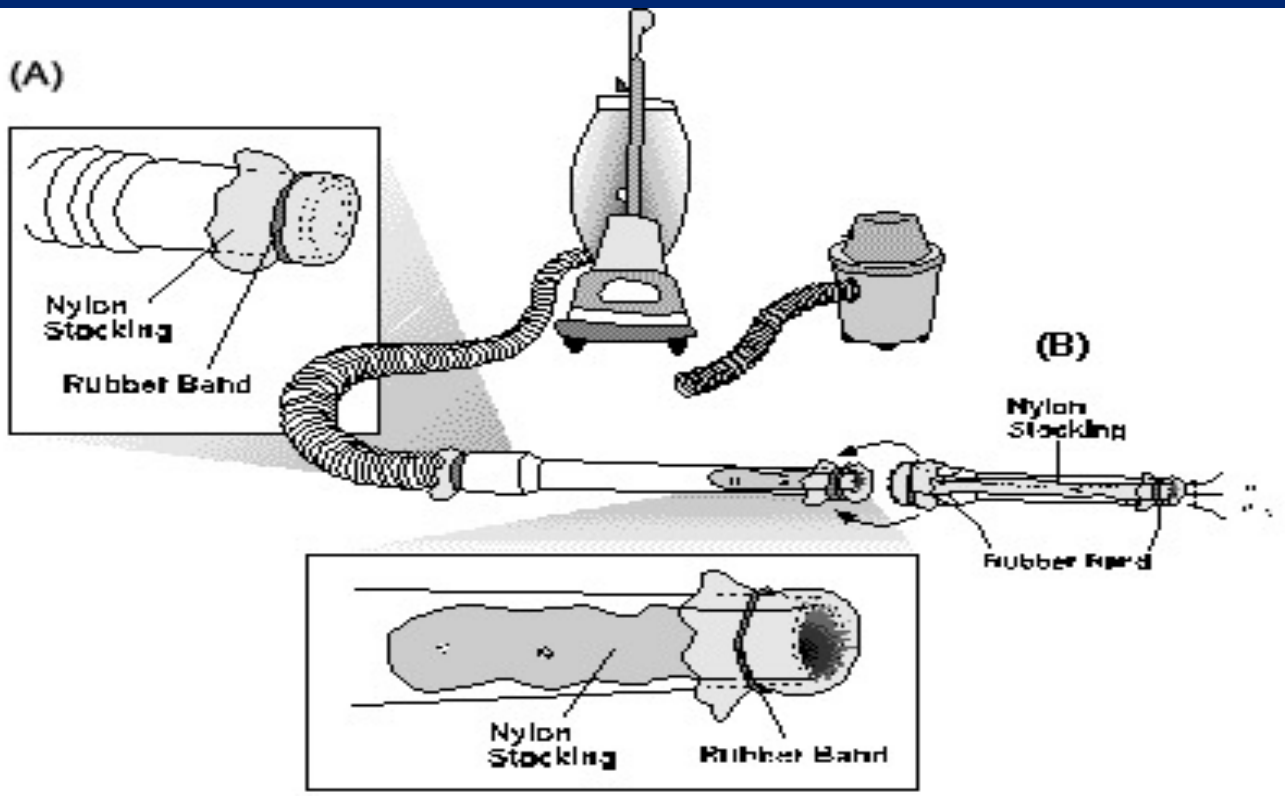


Figure 2. A nylon stocking inserted into a vacuum cleaner extension wand creates a handy bag for capturing lady beetles. Options also are to (A) rubber band a piece of nylon over the flexible hose to prevent lady beetle entry into the vacuum cleaner, (B) secure a nylon stocking (open at both ends) inside the foremost section of the wand to somewhat cushion the lady beetles and prevent staining.

Using a Vacuum Cleaner

Using a slipper or shoes as a mechanical pest control !!!

5- Biological controls.

- **Biological control of pests and diseases is a method of controlling pests (including weeds and diseases) in agriculture that relies on natural predation, parasitism or other natural mechanism, rather than introduced chemicals.**
- **Natural biological processes and materials can provide control, with minimal environmental impact, and often at low cost. The main focus here is on promoting beneficial insects that eat target pests.**

6- Chemical controls:

- Considered as an IPM last resort, synthetic pesticides may be used when other controls fail or are deemed unlikely to prove effective. Biological insecticides, derived from plants or naturally occurring microorganisms (eg: Bt), also fit in this category.

Chemical controls

Do most growers use IPM?

- With these steps, IPM is best described as a continuum. Many, if not most, agricultural growers identify their pests before spraying. A smaller subset of growers use less risky pesticides such as pheromones. All of these growers are on the IPM continuum. The goal is to move growers further along the continuum to using all appropriate IPM techniques.

How do you know if the food you buy is grown using IPM?

- In most cases, food grown using IPM practices is not identified like *organic* food. There is no national certification for growers using IPM. Since IPM is a complex pest control process, not merely a series of practices, it is impossible to use one IPM definition for all foods and all areas of the country. Many individual commodity growers, for such crop as potatoes and strawberries, are working to define what IPM means for their crop and region, and IPM-labelled foods are available in limited areas. With definitions, growers could begin to market more of their products as *IPM-Grown*, giving consumers another choice in their food purchases.

If I grow my own fruits and vegetables, can I practice IPM in my garden?

- Yes, the same principles used by large farms can be applied to your own garden by following the six approaches outlined above. For more specific information on practicing IPM in your garden, you can contact your state Extension Services for the services of a Master Gardener.

After a grain crop has been harvested,
burn off the stubble hope that a variety of soil dwelling

pests would be killed by the heat.

Insectaries

- Insectary plants: is a term used to describe plants that attract insects. As such, beneficial insectary plants are intentionally introduced into an ecosystem to increase pollen resources and nectar resources required by the natural enemies of harmful or unwanted insect pests. Beyond an effective natural control of pests, the friendly insects also assist in pollination.
- http://en.wikipedia.org/wiki/Insectary_plants
- (friendly insects also assist in pollination)

What to attract?

- The "friendly insects" include ladybeetles, bees, ground beetles, hoverflies, and parasitic wasps. Other animals that are frequently considered beneficial include lizards, spiders, toads, and flycatcher (insect-eating songbird). Beneficial insects are as much as ten times more abundant in the insectary plantings area. Mortality of scale insects (caused by natural enemies) can be double with insectary plantings. In addition, a diversity of insectary plants can increase the population of beneficial insects such that these levels can be sustained even when the insectary plants are removed or die off.
- (insect-eating songbird)

Where to plant?

- For maximum benefit in the garden, insectary plants can be grown alongside desired garden plants that do not have this benefit. The insects attracted to the insectary plants will also help the other nearby garden plants.

What Type of Plants?

- Many members of the Apiaceae (formerly known as Umbelliferae) family are excellent insectary plants. Fennel, angelica, coriander (cilantro), dill, and wild carrot all provide in great number the tiny flowers required by parasitic wasps. Various clovers, yarrow, and rue also attract parasitic and predatory insects. Low-growing plants, such as thyme, rosemary, or mint, provide shelter for ground beetles and other beneficial insects. Composite flowers (daisy and chamomile) and mints (spearmint, peppermint, or catnip) will attract predatory wasps, hoverflies, and robber flies. The wasps will catch caterpillars and grubs to feed their young, while the predatory and parasitic flies attack many kinds of insects, including leafhoppers and caterpillars.
- Other insectary plants include: mustard (Brassica juncea), phacelia (Phacelia tanacetifolia), buckwheat (Fagopyrum esceulentum), marigold (Tagetes patula), elderberry (sambucus mexicana), and Korean licorice mint (Agastache rugosa).
- http://en.wikipedia.org/wiki/Insectary_plants







mulch.
soil enricher


Personal Information:

Name: **Dr Abdul Hamid H. K. Al-Amidi**

ألأسم: د. عبدالحميد العميدي

Date of Birth: **28 April 1954**

تاريخ الولادة: 28 نيسان - ابريل 1954

Place of Birth: **Baghdad, Iraq**

محل الولادة: بغداد العراق.

Marital status: **Married with 4 children**

متزوج ولديّ 4 اولاد

Nationality: **Irish and Iraqi.**

حامل الجنسية الايرلندية.

Mobile: **+353 (0) 86-2208480**.
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Work: العمل

العمل: مدير شركة النيمو للبستنة والزراعة.

Nemos Horticultural Ltd.
(Diroctor)
Company Address:
37 Woodlands Rise,
Arklow,
Co. Wicklow,
Ireland.

Also working at:

العمل الثاني: مساعد محاضر في قسم الصحة البيئة, الجامعة التكنولوجية في دبلن, ايرلندا.

Technological University Dublin (TU Dublin),
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ملخص

انني الدكتور عبدالحميد العميدي من ولادة العراق ومواطن في ايرلندا الجنوبية منذ 40 سنة. حاصل على شهادة البكالوريوس في علوم الحياة, من جامعة بغداد, وشهادة الماجستير والدكتوراة في المقاومة الحيوية للافات الزراعية, من جامعة أيرلندا الوطنية, كلية منوث.

National University of Ireland, Maynooth.

من 2005 ولحد الآن (2021) اعمل بدوام جزئى كمساعد محاضر في الجامعة التكنولجية في دبلن.
في قسم الصحة البيئة, الجامعة التكنولوجية في دبلن, ايرلندا

Technological University Dublin (TU Dublin), Dublin 7, Ireland.

حاصل على براءة اختراع في المقاومة الحيوية للحشرات التي تصيب جذور النباتات في التربة.

https://www.thegardenshop.ie/supernemos/
, (http://www.faqs.org/patents/app/20100083390),

أنا أيضًا نشط للغاية في أيرلندا والعراق والمغرب ، في الترويج: بديل طبيعي للمبيدات الكيميائية. كذلك تشجيع إعادة تدوير النفايات الزراعية والبشرية وإدخال بديل لـ "للأساليب الزراعية القديمة" للتكيف مع تغيرات المناخية وخاصة في البصرة جنوب العراق.

من خلال عملي كمدير لشركتي: شركة النيمو للبستنة والزراعة المحدودة في ايرلندا.

Nemos Horticultural Ltd., Ireland.

تعاونت مع العديد من الشركاء في تطوير وتسويق المنتجات العضوية والمبيدات الحيوية والمحفزات الحيوية اللتي تساعد على زيادة المحاصيل الزراعية.

http://www.fpl-irrigation.com/Supernemos.htm

I am the inventor of Supernemos BioInsecticidal, https://www.thegardenshop.ie/supernemos/ ,(http://www.faqs.org/patents/app/20100083390) and hold a BSc. in Biology (Baghdad University) MSc. and a PhD. in Bio-Control (National University of Ireland, Maynooth) and have a Practical Experience, for the control of Red Palm Weevils, Vine Weevils and many other majors, insect pest species, by using a biological control agent and other environmentally friendly methods. I am also, very active in Ireland, Iraq, and Morocco, in promoting: a natural alternative to chemical pesticides. Also promoting the recycling of agricultural and human waste and introducing automated plant grows systems for growing indoor plants as an alternative to the "indoor classic agricultural methods", to help to adapt to climate change especially in Basra-Iraq. Working, part time in Technological University Dublin, Ireland, as Tutor/Assistance Lecturer in Ecology, Biology and Microbiology in the "Environmental Health Department". Working as a Company Director, Nemos Horticultural Ltd. and engaged with several partners, in the development and commercialization of organic based products, Bio-pesticides, Bio-stimulation. (http://www.fpl-irrigation.com/Supernemos.htm)

Presentation and Awards:

2008: **Public talk on 'Global Worming' presented for Arklow Multicultural Association, Ireland.**

محاضرة حول التغيرات المناخية, ألقية في جمعية تعدد الثقافات, اركلوا, أيرلندا.

2008: **Elected to be a chairperson for Arklow Multicultural Association, Ireland.**

انتخبت كرئيس لجمعية تعدد الثقافات, في منطقة اركلوا, ايرلندا

2012: **Winner: Green Product Award.**

حصَلَ منتوجي الحيوي (الحاصل على براءة اختراع) علي المرتبة الأولى للمنتوجات الخضراء على مستوى ايرلندا.

2012: **Winner: Green Innovation Award. 2012: Green Entrepreneurial Business Award Finalist. 2012: Irish Times/Inter Trade Ireland Innovation Award Finalist.**

براءة الاختراع, حصلت على جائزة الابتكار الاخضر على مستوى ايرلندا.

2012: **Presentation: Bio-Control as an alternative to chemical pesticide. The Second Scientific Conference for Agriculture College, University of Kufa, IRAQ, April 18-19.2012**

العرض التقديمي: المكافحة الحيوية كبديل للمبيدات الكيميائية. المؤتمر العلمي الثاني لكلية الزراعة ، جامعة الكوفة ، العراق ، 18-19 أبريل 2 01 2.

2013: **Winner: TV-CHANNEL AWARDS: UK Garden Product of the Year.**

2015: **Presentation: on the conversion of Agricultural and Human waste to energy, Al Kufa Agriculture College, Iraq.**

عرض تقديمي: حول تحويل النفايات الزراعية والبشرية إلى طاقة ، كلية الكوفة الزراعية ، العراق.

2015: **Presentation: on the use of the beneficial nematodes as an alternative chemical pesticide, Agricultural College, Basra, Iraq.**

عرض تقديمي: عن استخدام النيماتودا المفيدة كمبيد طبيعي بديل للمبيدات الكيميائية لمكافحة الآفات الزراعية في التربة ، كلية الزراعة ، البصرة ، العراق.

2016: **A Public Talk in Babel, Iraq, on the adaptation for the Claimed Change and the use of the new technology to conserve water in agriculture.**

نقاش عام في محافظة بابل ، العراق ، حول التكيف مع التغييرات البيئية, وكيفية استخدام التكنولوجيا الجديدة, للزراعة في المناطق التي تعاني من قلة المياة الصالحة للزراعة.

. إدخال تقنية جديدة تستخدم في الزراعة ، البصرة ، العراق

2016: **Introduce a new technology used in agriculture, Basra, Iraq.**

2019: **<u>Presentation:</u> on the effect of Agriculture Chemical Pesticides on human health "Do really know what you're eating?", Agronomy and Veterinary Institute Hassan II, Agadir, Morocco, 5.01.2019.**

عرض تقديمي: حول تأثير المبيدات الكيميائية الزراعية على صحة الإنسان "هل تعرف حقًا ما تأكله؟" معهد الهندسة الزراعية والبيطرية الحسن الثاني ، أكادير ، المغرب ، 5.01.2019

<u>Archive:</u>

1978: **Awarded Silver Medal for paper presented at Young Scientist Exhibition "Survey on the use of Pesticides in Iraq and promoting the Bio-control Control" and" Mapping and Exploring Wildlife of Caves in Sulamania, Northern Iraq."**

منحت الميدالية الفضية للبحث المقدم في معرض الشاب العلمي "مسح حول استخدام المبيدات الحشرية في العراق وتعزيز المكافحة الحيوية" والبحث الثاني "رسم الخرائط واستكشاف الحياة البرية للكهوف في محافظة السليمانية ، شمال العراق, عام 1978".

1978: **Papers Presented at the University "Students Scientific conference" (25-27 March 1978), Science College, Baghdad University:**

1-"Survey on the use of Pesticides in Iraq and "promote the use of Biological Control." and

2- Mapping and Exploring Wildlife of Caves in Sulamania, Northern Iraq.

1978: **Retrospective Exhibition of work presented in University of Sulaymaniyah and College of Education, Baghdad University.**

1977: **Awarded Gold Medal, For Presentation of a paper at Young Scientist Exhibition Baghdad on my discovery of "New genus of blind fish in Iraq**

منحت الميدالية الذهبية ، لتقديم بحت في مؤتمرالعلمي للشباب, في كلية العلوم في جامعة بغداد, عن اكتشاف "جنس جديد من الأسماك العمياء في العراق. عام 1977

1976: **Member of Research Team Mapping and Exploring Wildlife of Caves in Sulaymaniyah, Northern Iraq.**

Media coverage:

ان عملي في استخدام المبيدات الحيوية في ايرلندا, لقد الفت انتباه الاعلاميون المهتمين في الحفاظ على البيئة وصحتة الانسان.
هذة بعض الامثلة:

1- Mail on Sunday http://www.nemo.ie/bugs-life-web.pdf

2- The Sunday Time
http://www.supernemos.com/storage/worms-turn-supernemos.pdf

3- Irish Time:
http://www.supernemos.com/storage/irish-times-intertrade1.pdf

4- Research article **HLI Magazine** http://www.nemo.ie/findingnemo.pdf

6- Irish Independent (Farming)
http://www.supernemos.com/storage/irish-independent-supernemos-art.pdf

7- Product of the Week: Supernemos Organic Insecticide
https://www.independent.ie/lifestyle/product-of-the-week-supernemos-organic-insecticide-29367123.html

Radio:

Country Mix radio interview (May 2010)
http://www.nemo.ie/country-mix.mp3SuperNemos Sunshine Radio Dr. Al-Amidi with Bill Hargreaves: http://sunshineradio.ie/updates/2012/01/25/bill-hargreaves-5/

Television:

As seen on TV3? Ireland AM
http://www.tv3.ie/ireland_am.php?video=39522&locID=1.65.74

Work Experience:

2005: **To Date: Part Time Tutor/Assistance Lecturer in Microbiology, Biology and Microbiology in Environmental Health. (Technological University Dublin (TU Dublin)).**

2008: **To Date: Director at Nemos Horticultural Ltd. engages with several partners, in the development and commercialization of organic based products, Bio-pesticides, Bio-stimulations.**

2003 –2005: **Consultant to Quaver Technologies Ltd. (Organic solutions for water treatment, slurry treatment and odour abatement during the recycling of organic waste). Co. Monaghan, Ireland.**

1997 – 2000: **Owner /manager of Úr Mushrooms producing pesticide – free Mushroom for home and export.**

1997- 1999: **Technical director Bio- Cara Ltd. (Biological pest control & water treatment and odour abatement during mushroom composting process, recycling of organic waste Organic Products).**

1997 –2001: **Consultant to Fungal Biotechnology, BioResearch Ireland in University College Dublin,Dublin 4, For the control of Pests and Diseases in Mushroom Compost with special emphasis on Bio control (i.e. as an alternative to chemical pesticides).**

1994 – 1997: **Pests and diseases analysis service for the Mushroom Industry in Ireland. Fungal Biotechnology, BioResearch Ireland, UCD, Dublin 4.**

1986 – 1993: **Senior demonstrator in Botany, Zoology and Plant Physiology to 1st and 2nd Year Science Students (St Patrick's College, Maynooth).**

1991 – 1992: **Post- Doctoral Research: (St Patrick's College, Maynooth) on "Insect Parasitic Nematodes for Biological Control".**

1988 – 1989: **Research Assistant on project: Investigation of the use of the use of Biological Control on Mushroom Pests on a Commercial Scale (Teagasc, Kinsealy Reasearch Centre).**

EDUCATION AND QUALIFICATIONS:

1988-93: **Ph.D. St. Patrick's College Maynooth, Co. Kildare.**
"Studies on the Occurrence of Pests in Irish Mushroom Composts and The efficiency of the predatory mite *Parasitus bituberosus* (Acari-Parasitidae) against cecids and sciarids."

1986-87: **Research Project:**
Screening for pathogenic fungi to control sciarid and cecid in mushroom compost.

1983-86: **MSc. St. Patrick's College, Maynooth, Co Kildare.**
"Studies on *Parasitus bituberosus* and its potential for the control of *Heteropeza pygmaea* in Mushroom Compost.

1982-83: **MSc. Qualifier St. Patrick's College Maynooth, Co. Kildare.**
Attended advanced courses on Biological topics including Genetics, Microbiology, Biological control, Plant pathogens, Plant stress and Community structure.

1974-78: **BSc. Biology, Baghdad University (Iraq),**
Secondary subjects: Psychology and Education. 7

Publications and Citations:

AlAmidi, A.H.K. (2008), Formulation for the biological control of insect-pests. (WO/2008/117262)

Morris, E., Al-Amidi, A., Murphy, E., Maguire, Y. and Doyle, O., 1999. To Determine the Origin of Weed Mould Infestation. The Second all Ireland Mushroom Conference, MONAGHAN., p 92.

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