

alternative hosts and shelter for pest or otherwise clean farm sanitation.

ii). A rotation of different crops should be used on soils previously used for growing host plants. This is to reduce the effects of soil pests by breaking their reproductive cycle. Plants should be uprooted and destroyed or ploughed under the soil after harvesting.

iii). A 'closed season' should be operated that is when sowing of a new crop is delayed for at least two months after the harvest of the previous crop.

iv). Synchronizing planting dates within one area. Crops such as okra, pepper which are also preferred hosts of pests, should only be planted at the same time. When this is applied in conjunction with the closed season, it will break the pest life cycle.

v). Manipulation of planting dates reduces cotton pests.

vi). Deep and early ploughing of cotton field, which was previously used for cotton, exposes the larvae, soil pests to desiccation and predators.

vii). Inspect plants regularly; once or twice a week after plants begin to bloom. Early detection of eggs and/or caterpillars before they bore into the pods is important.

viii). Hand pick and destroy eggs and caterpillars. This helps when their numbers are low and in small fields.

b). Insecticides.

i) Polythrin C (Cypermethrine + Profenofos 16 g + 150 g/l) and

Sherpa plus (Cypermethrine + Dimethoate 12g + 100g/l) has been effective.

ii). Sherpa plus (cypermethrine 12g + dimethoate 100g/l) was very effective particularly on most insect pests especially on cereals and malvaceous plants.

iii). Spraying with quinalphos 25 EC (2 ml/litre of water) or carbaryl (4 g/litre of water) or carbaryl 50WP 2 g/lit or profenophos 0.05 per cent effectively controls the pest. Before spraying all the affected plant parts should be removed.

BIOLOGICAL CONTROL

i. Conserve natural enemies. The African bollworm has a wide variety of natural enemies. Parasitic wasps and predators such as ants, lacewings, assassin bugs (Figure 2 below) and ladybird beetles are important in natural control of this pest which has been successful.

ii. Mixtures of bioagents such as vivux (applied as nuclear polyhedrosis virus (HaNPV) @250-500 larval equivalent/ha), dipel, xentari, *Bacillus thuringiensis* var. kurstaki 2 g/lit. Collect and destroy the infected fruits and grown up larvae. Do not spray insecticides after maturity of fruits. Spray with botanicals or neem extracts has been successful with good spray coverage and targeting small caterpillars before they bore into the flowers, bolls and pods is very important (Figures 1 & 3 below). <http://www.infonet-ivision.org/res/res/files/1530.280x185.clip.ipeget-biovisio>



Figure 1: Bioagent used for the control of *H. armigera*



Figure 2: Assassin bug feeding on *Helicoverpa*



Figure 3: Bioagent used for the control of *H. armigera*

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THE VISITORS OF THE DEAD: THE ROLE OF ENTOMOLOGY IN FORENSIC PRACTICE

Forensic Scientist uses in forensic investigation. This contribution of entomology to forensic science is Forensic Entomology which should work in cooperation with others especially in the greater part of the world where newer methods such as the use of DNA for human identification are either not available or are still far too expensive for general application.

During the Annual Conference of the Entomology Society of Nigeria tagged ABUJA 2014, a comment by Professor Samuel Asala, representing the Vice Chancellor, brought to light the generally unrecognised relationship between entomology and forensic medicine. For example, careful insect data analysis can assist in forensic investigations such as the determination of time since death (post-mortem index) and site of crime. At a subsequent College of Health Sciences lecture titled "Dead Bones Speak Too: The Role of Bones in Human Identification", Professor Asala alluded to the fact that forensic practice is in a rudimentary stage in Nigeria. He encouraged scientists and practitioners in different areas of the discipline (Pathology, Biological Anthropology, Pharmacology, Law, Chemistry/Biochemistry, Entomology etc.) to come together to enhance forensic practice and interdisciplinary research in Nigeria.

ESN Elect New EXCOs

The Society at his 45th Annual Conference elected
New Excos as follow:

Prof D.A. Enobakhare FESN, KSM President
Dr K.A. Kemabonta Vice President
Prof M.O. Ashamo FESN National Secretary
Dr A.A. Oyerinde Asst. Sec/PRO
Dr A.M. Malgwi Treasurer

ESN National Secretariat in Abuja

The University of Abuja Governing Council approved the request for land for the construction of the Entomological Society of Nigeria Secretariat at the Main Campus of the University.

ESN at National Science Summit

The President Professor D.A. Enobakhare FESN, KSM was ably represented by the Assistant Secretary/PRO at the Nigerian Academy of Science National Science Summit held at the Royalton Hotels Abuja, on the 12th and 13th of May 2015. The meeting discussed and formulate strategies for improving scientific research and innovation among science institutions and tertiary institutions in Nigeria, strengthen and build the capacity of science based associations in Nigeria, and foster collaboration among national science associations and other key stakeholders for national development. The Entomological Society of Nigeria representative presented the Society's reviewed Curriculum for Entomology studies in Nigeria at the forum.

Loss of Immediate Past President

The Society lost the Immediate Past President and trustee, Prof Dike FESN on 7th January 2015 and was buried on 6th February 2015. The Society was adequately represented at the burial. The ESN delegation was led by the President, Prof Enobakhare FESN; others included Prof Ashamo FESN, Prof Ogbogu FESN and Dr Oyerinde. Prof Badejo FESN, Prof Okiwelu FESN and members from Umuahia/Umudike branch led by Dr Echendu also attended the funeral. Letter of condolence was written to the family. Letters of condolences were also written to Profs Epidi and Adamu who lost their father and mother respectively.

Promotions/Elevations/Appointments

PhD Defense

Mr M.M. Manyi, Stanley Dimkpa, Azawei Alamene

Msc Defense

Yakubu Appollm Iliya; Bitrus Eli; Eyitayo E. Oshegbemi, M. O. Adeyeye

Promotions

Dr. Y.T. Maina (Maiduguri Branch) & Dr. B Matur (Abuja Branch) were promoted to the rank of Professor
Dr N.J. Okonkwo (Awka Branch) has been promoted to the rank of Reader.
Drs A.A. Oyerinde and Mrs S.W. Asala (Abuja Branch) have been promoted to the rank of Senior Lecturer

Appointments

Prof. L.E. Lale has been appointed as Vice Chancellor University of Port Harcourt
Prof Asala has been re-elected as Provost of College of Health Sciences, University of Abuja
Prof T. T. Epidi has been appointed Deputy Vice Chancellor (Administration) of the Niger Delta University
Prof. E. B. Alo got an appointment as a member of the Board of Council with the Estate Investment Company Limited.
Dr. Kabe, C.S. Oaya; Dr. M. M. Degri; Dr. H. Nahunnaro and Dunuwel D. M. have been appointed as HODs
Dr A. A. Oyerinde has been appointed Faculty of Agriculture, University of Abuja Examination Officer and member of the University's Research Grant and Ceremonials Committees.

Award

Prof. Anthony Youdeowei was given an award for his meritorious service in pest management at the International Plant Protection Congress (IPPC 2015) at Berlin, Germany held 24-27th August 2015. The duo of Profs Adedire and Ashamo (ESN National Secretary) were at the event to felicitate with him for his laudable achievement.

Bereavements

Lost the Immediate Past President and trustee, Prof Dike FESN
James Edache (Abuja Branch)
Umar Yunus Fatimo (Kano Branch)
Profs Epidi and Adamu who lost their father and mother respectively
Prof R.I. Ekwuatu lost his very dear mother
Mr Samuel Cheron from Akperan Orshi.
Mrs Stephanie Adelusi lost her mother.

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Human Interference (Urbanization and Industrialization): Consequences on Insects and Human Health

ecosystem. The ever increasing population can also be blamed for the deterioration of the environment. More number of people indicates increased demand for food, clothing and shelter. This demand is leading to deforestation for the purpose of industrialization and urbanization which in turn is affecting the ecological balance. Many people might feel that urbanization and industrialization is the need of the hour, and can't be stopped but it needs to be reduced because the effects of over interference will not stop with our generation.

The harmful consequences will be carried forward to further generations and the magnitude of the ill effects will be ever increasing. Let us take the example of the development and large scale use of insecticides. Insecticides have definitely helped in the immediate eradication of pests and insects that damage crops and increased the yield. But these insecticides have also poisoned the birds which feed on these insects. Temporary results are noticed by all but the long term effects are being ignored as the resultant death of the birds will rapidly increase the number of insects as their direct predators are fewer in number. This leads to an imbalance in the natural cycle which further has many negative consequences. Thus, the bottom line here is that the interference of humans with the environment has been increasing over the years and the ill effects, though might not be visible immediately, will start appearing in future and will pose a great risk to

the pest and disease management in agriculture, public health and the environment.

The influence of the interference of urbanization and industrialization on arthropods and other organisms, public health and environment can be ascribed to be as a result of human civilization in terms of de-vegetation or deforestation, Groundwater Contamination, Surface Water Pollution, Air Pollution, Climate Change viz a viz agricultural activities such as the use of pesticides and herbicides, and the release of other toxic compounds into the environment have all taken their toll, particularly on vertebrates and also lead to Defacing of Landscape and destruction of natural habitat of insects and other arthropods on air, soil, and water.

The World Conservation Union (IUCN; Gland, Switzerland) now includes more than 16,000 entries in its Red List of Threatened Species: 5,624 vertebrates, 2,101 invertebrates and 8,390 plants (IUCN, 2006). The number of documented extinctions since 1500 AD is now 784 species and the IUCN estimates that extinction rates are now 50 to 500 times higher than previous rates calculated from the fossil record (Baillie *et al*, 2004).

Resultantly for survival, many animal and plant species have adapted to the new stresses, food sources, predators and threats in urban and suburban environments, where they thrive in close proximity to humans. Their success provides researchers with valuable and sometimes unexpected insights into evolutionary and selective processes. Because these

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ASPECTS OF ENTREPRENEURSHIP IN ENTOMOLOGY

3. Business ideas in Agriculture for Young Entrepreneurs

[Http://www.mytopbusinessideas.com/agriculture-ideas/](http://www.mytopbusinessideas.com/agriculture-ideas/)

4. Definition of apiculture/Define apiculture-biology dictionary online biology dictionary online-

<http://www.icoachmath.com/biology/definition-of-apiculture.html>

5. Expert makes case for mulberry sericulture to address unemployment.

[Http://www.kwasu.edu.ng/index.php/expert-makes-case-for-mulberry-sericulture-to-address-unemployment.](http://www.kwasu.edu.ng/index.php/expert-makes-case-for-mulberry-sericulture-to-address-unemployment)

6. From Honey to Money Why African entrepreneurs should be interested in the beekeeping business:

<http://www.smallstarter.com/browse-ideas/agribusiness-and-food/beekeeping-and-honey-business>

7. How to Start a Maggot Breeding Business (Beginners Guide):

<https://books.google.com.ng/books?id=WlRrBAAAQBAJ>

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