Pesticides & Pollinators

Pesticides and pollinators. Is it possible to ever use these two words together without a mass debate ensuing? On a rudimentary level it appears that only two groups are involved in this debate, and it seems as if they are on polar ends of the "saving the pollinator" spectrum. The scenario is often illustrated as the proponents of bee health lobbying for certain pesticides to be banned because it has been shown in some laboratory tests to be hazardous or it has been banned elsewhere, while the pesticide industry refuses to take their products off the market due to a lack of evidence of the so-called risk of their products. Unfortunately, it's not as simple as that and this picture does not cover the entire story.

We have been hearing stories about a bee-apocalypse for many years, notably in Europe since the 1990s and, to some extent, with cases of so-called "colony collapse disorder (CCD)" in the US since 2006. It makes a great headline. It is unfortunate that the facts get lost amid the controversy. The European Commission's own report on National Apiculture Programs in the European Union shows a steady increase in the number of beehives from 11 million in 2004 to 17 million in 2018. Bee colonies die off over winter, sometimes losses are as much as 20%, and numerous other factors including weather conditions, parasites and diseases can also play a role.

So how then does one go about getting the facts straight? The answer lies in the simple, yet significant concept of context. Let us use the example of agricultural remedies collectively known as neonicotinoids. Neonicotinoids (or "neonics") and pollinators have been getting a lot of attention lately as recent reports have shown neonics to be harmful to beneficial insects. There are plenty of considerations that contribute to showing why context is important in this regard, however for the purpose of this article, we will focus on only three of these. The first is to put the research environment into context, second the concept of hazard versus risk and thirdly, to examine regulations and the agricultural environment.

Let's start off with the research environment. Numerous laboratory studies have shown that neonics can cause various adverse effects upon bees under particular conditions. But how relevant are those conditions in real life? In fact, there are no studies that show such negative impacts of sub-lethal effects of correctly applied neonicotinoids on honeybee colonies under field-realistic exposure conditions. For scientists to draw conclusions or extrapolate results from laboratory exposure studies and assuming they reflect behaviour following field use, or not testing their hypotheses of toxicity in field conditions, is not scientifically plausible. It would be the same as saying, for instance, in these laboratory tests it was shown that bleach is highly toxic to humans, therefore, the use of bleach kills humans. Some would even go as far as saying the bleach industry is making millions by selling bleach that kills humans. See the difference? This example nicely leads us to the next consideration, namely hazard versus risk.

Pesticides & Pollinators cont.

The difference between hazard and risk is that hazard refers to the possibility of something causing harm while risk is the probability of harm occurring. Imagine sitting in front of the fireplace on a cold, rainy evening, enjoying a bottle of your favourite red wine. Sorry to burst your bubble, but alcohol is a class 1 carcinogen, similar to arsenic, making it a hazard. However, it only becomes a risk if you regularly guzzle down litres of the stuff, or if you become intoxicated and do something stupid. A car is a hazard, driving it like a formula one racer in an urban area is a risk. Standing on the edge of a cliff is a hazard, jumping off it is a risk. The issue of pesticides in the South African context, as well as the regulation thereof, is based on a risk approach, and not a hazard approach. Which brings us to our last point.

Although a pesticide is categorised as hazardous, it does not mean its use should be banned. If it's been proven safe in local assessments and does not pose a non-manageable risk to human health and the environment, which includes pollinators, then farmers should be able to use the products to effectively manage pests. The European Union recently placed heavy restrictions on some neonics so that they cannot be used outdoors.

The basis for these restrictions was the application of a "Bee Guidance Document" which has yet to be ratified by EU Member States, some seven years after it was first drafted by EFSA (the European Food Safety Authority). This Guidance Document is now being revised, not least because it places conditions on field trials that cannot be met, meaning that field trials that have been done over many years to EPPO standards, are not accepted. Even when applying such a conservative Guidance, EFSA did not find any unacceptable risks to honeybees after examining hundreds of different use scenarios for some of the neonics they assessed. However, the political pressure in the EU was so high that the Commission adopted a very precautionary approach and imposed the near-total ban. Regulators in other regions, including US, Canada, Australia, and Brazil continue to apply a risk-based approach and apply restrictions only in cases where safe use of the products cannot be ensured.

In conclusion, it is important to understand that there are many factors impacting bee health, including diseases caused by viruses, bacteria, fungi, and mites, poor nutrition, adverse climatic conditions, lack of genetic diversity and lineage, incorrectly applied veterinary treatments, poor beekeeping management and of course, irresponsible use of pesticides (emphasis on irresponsible). Isolating one specific factor as the main cause of the decline in bee health is just implausible.

It's understandable that many people want to find a scapegoat for the stories that bees are in danger, it would make finding a solution so much easier and pesticides are an easy target. But real life is a bit more complicated than that and we all need to work together to ensure the safety of our pollinators. And, before jumping to any conspiracy theory conclusions, it might help to remember that for agriculture to continue, we need pollinators, and no one is more aware of this than the farmers and the pesticide manufacturers. It is in all our interests to protect pollinators, not to put them at risk. No one, no matter which country, region or industry they are in, wants to go hungry.

Elriza Theron, CropLife South Africa

Stewardship

CropLife Malawi trains Member Companies on the management of Fall Armyworm

Fall Armyworm (*Spodoptera Frugiperda*) was first reported in Malawi in December 2016 in Blantyre and Machinga Agriculture Development Divisions. Since that time this pest has proved to be a menace threatening the food security of Malawi and other maize dependent countries in Africa. Efforts have been made by the Government of Malawi through the Ministry of Agriculture Irrigation and Water Development and developing partners in addressing the problem through the provision of financial resources to procure and distribute pesticides to the farming communities. The Ministry together with development partners have also helped in raising awareness, distributing communication materials to farmers, and offering training to extension staff and researchers on the management of this pest.

In January 2020, CropLife Africa Middle East conducted a Trainer of Trainers (ToT) in the management of Fall Armyworm in Lusaka, Zambia, for national associations in the East and Southern Africa region where representatives were drawn from Kenya, Malawi, South Africa, Tanzania, Uganda, Zambia and Zimbabwe. CropLife Egypt was also invited. As a requirement, representatives from participating countries undertook to cascade down the knowledge learnt to member companies within their respective associations.

CropLife Malawi was represented by its Executive Secretary, Christopher Beya. CropLife Malawi received financial support from CropLife AME and organized trainings in the cities of Lilongwe and Blantyre, where most of its members operate from and trained participants drawn from its membership. The training covered the following topics; Current Situation of Fall Armyworm in Malawi; Fall Armyworm Lifecycle; Fall Armyworm Biology and Ecology; Scouting and Monitoring; Integrated Pest Management; and Resistance Management and Chemical Control.

The training included a practical session and participants were taken to maize fields in Kasungu and Chikwawa to learn first-hand of the identification of the Fall armyworm lifecycle, integrated pest management, host crops and resistance management, among other issues. Participants have been requested to further cascade down the knowledge acquired and train farmers, and fellow workers, who are either extension staff and frontline sales staff from various agro-dealers.

Christopher Beya, CropLife Malawi

SSPs in Ghana

The group of 268 Spray Services Providers (SSPs) that have been active in Ghana under the SNV HortiFresh program in Ghana, have extended their business services to farmers with Integrated Pesticide Management (IPM) practices. In February and March, the group underwent a 2-day IPM training program that was developed by CropLife Africa Middle for SSPs. In spite of the challenges the team faced with the increased restrictions on field work owing to the COVID-19 crisis, all programs were completed successfully.

The main objective of the course was to give SSPs practical tools to apply IPM practices at the farms of their clients (farmers). They learned about factors that influence pests and diseases, to better understand how to mitigate negative factors and stimulate positive factors. In the field, they applied all the steps of the IPM decision-making cycle, including taking decisions on controlling any pest/disease depending on the situation in the field, including the economic aspects.

In general, SSPs were very enthusiastic. Many of the preventing measures discussed during the course, were not known to SSPs and the feedback was that this knowledge would gain a lot of trust from farmers. The topic on the economic aspects of IPM created loads of discussions as most SSPs had never thought about taking the economic aspect into account when deciding to apply pesticides or not. The existence of beneficial insects was new to several of the SSPs; they had never realized before that other control measures and careful selection of pesticides is necessary to preserve them.

With the start of the cocoa season, the SSPs will be able to apply what they have learned and help farmers to better control pests and diseases on their cocoa farms

Manon Dohmen

Regular hand washing was part of the training program due to the COVID-19 virus

Session on the identification of the pests and diseases

Going through the IPM decision-making cycle in the field

SNV Ghana

CropLife AFRICA MIDDLE EAST

Responsible Use Training for National Irrigation Authority Farmers

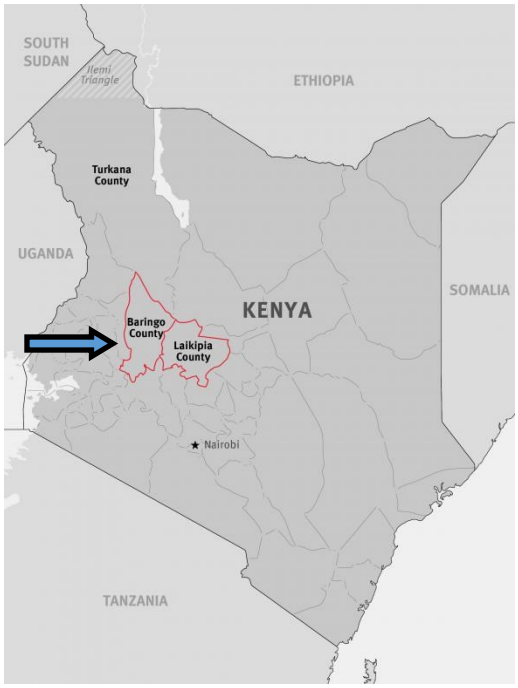
At the heart of the Great Rift Valley, within the arid Baringo County, is an oasis that is fed by the Perkerra river and its tributaries. Along the banks of the river, thousands of acres are irrigated by the local communities who grow crops ranging from water melons, onions, tomatoes, seed maize, plus other crops.

The 5 irrigation schemes along the river banks and the hilly countryside which form part of the catchment area were organized for a 1-day training on Responsible Use of pesticides. Such a remote farming outpost rarely gets adequate information on the responsible handling of pesticides and therefore on the week of 9 - 13 March 2020, 307 farmers and opinion leaders were taken through the farmer training curriculum on the Responsible Use of pesticides.

These irrigation fields have borne the brunt of invasive pests over the recent years and the use of crop protection products has become inevitable. The topic on exposure and the importance of proper PPE was met with enthusiasm and was an eye opener to many farmers who had so far not considered the implications of their past practices. At the same time, they decried the availability and cost of the equipment which was beyond the reach of the majority.

The 5 irrigation schemes are managed by the National Irrigation Authority of Kenya. The Authority oversees the irrigation infrastructure and provides inputs to select farmers. An impromptu sensitization on the management of obsolete stocks was administered to staff of the host institution. In the course of the conversation, it was established that 1.5 tonnes of assorted pesticides are recorded in their stores as having expired. These stocks were verified by product name and active ingredient and plans are underway to assist the irrigation scheme in the safeguarding and disposal.

Benson Ngigi, CropLife Kenya



CropLife Tanzania attends and presents at workshop on farmers' empowerment

CropLife Tanzania participated and presented at a workshop that was organised by Tropical Pesticides Research Institute (TPRI) in collaboration with Tanzania Telecommunications Corporation (TTCL) that was held in Dar es Salaam on 27 and 28 February 2020 in Dar es Salaam.

About 30 representatives from various importers and distributors of agrochemicals attended the two-day seminar that was organised by TPRI and TTCL to showcase the "e-hakiki" program being rolled out on empowering farmers in identification and use of registered and quality pesticides.

Counterfeit agrochemical products have been a major issue in various geographies in the country and Africa at large and the fight will only be won when industry players, government, stakeholders as well as local and international partners work jointly and collaboratively to find permanent solutions in the fight against counterfeit pesticides.

Left: Joseph Bukalasa - Acting Registrar of Pesticides - Tanzania

Centre: Joseph Mwalshiuye - Chairman of Pesticides Approval & Registration Technical Committee

Right: Dr Margaret J Jollel -Acting DG TPRI

The seminar also addressed the need for the pesticides regulatory authority to enhance the collaborative ties with CropLife Tanzania for shared responsibility of pesticides management in the country.

Stella Simiyu Wafukho, Director Regulatory Affairs & Stakeholder Relations for CropLife Africa Middle East presented on the importance of enhancing CropLife Tanzania - collaboration with the Pesticide Authority, SSPs, management of empty pesticide containers as well as obsolete pesticides while Frank Wenga, Vice Chairperson of CropLife Tanzania presented on the roles of CropLife Tanzania - its strengths, challenges and the required cooperation with the registrar of pesticides.

Other objectives of the meeting were to discuss modalities of how CropLife Tanzania can be more active as an association and how to enhance collaboration between CropLife Tanzania and TPRI.

Participants agreed that CropLife Tanzania had an obligation to train farmers and or stockists on the responsible management of pesticides as well as supplying only genuine agrochemicals. It was decided at the meeting that membership of CropLife Tanzania was mandatory by all importers, distributors and retailers of pesticides with a request to CropLife Tanzania to revisit the membership fee structure introducing different categories and even a proposal to pay the fees in Tanzanian shillings or in instalments

Other government agencies who participated at the workshop included the Tanzania Bureau of Standards (TBS) as well as Tanzania Fair Competition Commission (FCC).

Following the workshop, a steering committee was established to help with fortifying CropLife Tanzania in increasing membership and the implementation of programs. Mr. Habib Mkalanga was co-opted on the committee. The committee will later reach out to CLAME leadership on training and program planning.

Frank Wenga, CropLife Tanzania

Dr Margaret J Jollel Acting DG TPRI with Frank Wenga - Vice Chairman - CropLife Tanzania

Regulatory Advocacy

Managing the build-up of obsolete stocks through revalidation of expired product for environmental safety

One of the ways recommended by the Food and Agriculture Organization (FAO) for reducing and managing stockpiles of old pesticide products, is to reassess the strength of the products.

This is done scientifically to determine whether they are still reusable or whether they should be declared obsolete. Noting that the cost of disposal of obsolete products is enormous compared with the cost of retesting, most countries opt to do retesting and relabelling using specific guidelines or doing this administratively without relabelling.

The agrochemicals industry in Kenya through CropLife Kenya has developed a guideline to be shared with the regulatory authority. The guideline was developed with reference to international guidelines and best practises on storage stability studies such as FAO, CropLife Technical Monograph No.17 among others.

The industry, armed with the documents and evidence of same practises elsewhere will seek concurrence, adoption and domestication of the document as a Kenyan guideline on revalidation and shelf-life extension.

Joel Mutai, CropLife Kenya

Electronic submission of registration data - Kenya

In this period of the COVID-19 pandemic, the Agchem industry in Kenya is expected to continue availing the products required to manage various pests and diseases which are ravaging its crops, thereby putting the country in a possible state of food insecurity. The pesticide regulator in Kenya, Pest Control Products Board, as a measure of intervention to ensure the continuous assessment of products due for registration, has sent out a circular to the members that online the submission of data electronically for the products due for registration and that this process is now acceptable.

Members are requested to send the completed data summary form and other supporting documents electronically. Products Label submissions for the renewal of registrations can also be sent electronically. This move has been applauded by industry as it will ensure the registration of products in the queue continues unhindered and farmers are able to access new tools to manage pests and diseases This concession however, does not include the dossier submission of data for a new product registration.

Joel Mutai, CropLife Kenya

Exciting Future for South African Biotechnology as CropLife appoints Lead for Plant Biotechnology

CropLife International, the voice and leading advocate of the plant science industry, has announced that it is transitioning its biotechnology programmes in Southern Africa to CropLife South Africa. Following trends from elsewhere in the world, the consolidation will bring plant biotechnology and crop protection activities under one organisation, CropLife South Africa, with a goal of capitalising on synergies between the two technologies in delivering integrated pest management solutions.

The transition includes the appointment of a lead for plant biotechnology at CropLife South Africa. The purpose of the position is to support the ongoing successful commercialisation of plant biotech products as well as trade of biotech commodities into and out of South Africa. Heading up this exciting position is newly appointed Chantal Arendse, who will take up the role in June of this year.

Arendse is no stranger to the industry and has over two decades of experience in the agricultural sector. She has held positions at the Agricultural Research Council (ARC), the National Department of Agriculture (NDA), the Department of Agriculture, Forestry and Fisheries (DAFF), and more recently, the United States Department of Agriculture - Animal and Plant Health Inspection Services (USDA-APHIS). She holds a MSc, Plant and Soil Science (Cum laude) from Tuskegee University and a B.Sc. Honours degree in Microbiology from the University of Cape Town.

“I am delighted that we have been able to attract a talent such as Chantal into the CropLife SA family. CropLife SA member companies strive to offer balanced pest control solutions to South African farmers, so it is a logical progression to combine traditional plant protection offerings with new technologies, like plant biotechnology, in order to achieve the goal of providing sustainable and integrated pest control solutions for local farmers. As the industry association representing most companies providing such integrated plant protection offerings, CropLife SA needs to continually adapt its mandate and activities in order to support its member companies equally”, says CropLife SA chief executive officer, Rod Bell.

The plant biotechnology industry in South Africa compares well with international trends. Although climatic conditions have been challenging since 2014, South Africa is still ranked as the World’s 8th largest producer of biotech crops based on the 2018 figures, with an 87% adoption of biotech maize, 95% adoption of biotech soybean and 100% adoption of biotech cotton.

In order to provide our farmers with the best possible plant protection tools to grow these healthy crops, CropLife promotes the principles of integrated pest management which involves using the best combination of cultural, biological and chemical measures for particular circumstances, including plant biotechnology. For this reason, the convergence of traditional crop protection strategies and plant biotechnology is essential in providing sustainable agricultural solutions.

Elriza Theron: CropLife South Africa

Plant Biotechnology

COVID-19 Vaccine Development Using New, Fast-Growing Tobacco Plant Technology

British American Tobacco (BAT) has joined the race in developing a potential vaccine for COVID-19 using a new, fast-growing tobacco plant technology. BAT's biotech subsidiary in the United States, Kentucky Bioprocessing (KBP), is developing the potential vaccine for COVID-19 and is now in pre-clinical testing. BAT and KBP work closely with the U.S. Food and Drug Administration (FDA), U.S. Biomedical Advanced Research and Development Authority (BARDA), and the United Kingdom's Department for Health and Social Care.

In an interview on Ian King Live on Sky News in the UK, BAT's Chief Marketing Officer Kingsley Wheaton said that their work on the potential vaccine is carried out on a not-for-profit basis. KBP has cloned a portion of COVID-19's genetic sequence which led to the development of a potential antigen. The antigen was then inserted into tobacco plants for reproduction. Upon harvest, the antigen was purified and is now undergoing pre-clinical testing.

The potential vaccine in development uses BAT's proprietary, fast-growing tobacco plant technology which has several advantages over conventional vaccine production technology. It is potentially safer as tobacco plants cannot host pathogens causing human diseases. It is also faster because the elements of the vaccine accumulate in tobacco plants much more quickly – 6 weeks in tobacco plants versus several months using conventional methods. The vaccine formulation in development remains stable at room temperature, unlike conventional vaccines which often require refrigeration. Lastly, it has the potential to deliver an effective immune response in a single dose.

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Biotech Stacks Adoption Continues to Increase Globally

The biotech method of gene stacking has brought us many notable products such as Golden Rice, Blue Rose, and SmartStax™. What is gene stacking and why is there a 'stack boom' in the biotech crop market? What does the future hold for biotech stacks?

Gene stacking refers to the process of combining two or more genes of interest into a single plant. Gene pyramiding and multigene transfer are other monikers in the scientific literature referring to the same process. The combined traits resulting from this process are called stacked traits. A biotech crop variety that bears stacked traits is called a biotech stack or simply stack.

It is estimated that a total of 80.5 million ha were planted to biotech stacks in 2018. This accounts for more than 42 percent of the 191.7 million ha of biotech crops planted worldwide. The US Department of Agriculture estimated that 89 percent of cotton acres and 80 percent of corn acres were planted with stacked seeds in 2019.

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Native Australian Plant Paves Way for Vaccine Development Against COVID-19

Dr. Peter Waterhouse led the team of scientists who successfully sequenced the tobacco benth's genome. The genome sequence is now being used to develop a vaccine against COVID-19. Photo Source: Queensland University of Technology

A team from the Queensland University of Technology (QUT) spearheaded the genome sequencing of an ancient Australian plant years before the COVID-19 pandemic broke. Now, the sequence is being used globally to develop a vaccine to fight against the deadly virus.

Nicotiana benthamiana is an ancient native tobacco plant found in Northern and Central Australia. Experts suggest that the plant may hold the key to growing crops that can withstand disease and climate change. The QUT team, along with the European Horizon2020 Newcotiana Consortium, started a project three years ago that aimed to develop plants that can be used for molecular farming, a discipline that involves using plants as biofactories for the production of protein-based products. The QUT team identified N. benthamiana, or benth as the scientists call it, due to its potential to make larger quantities of high-quality vaccine and antibodies considering it has about twice the number of genes compared to the ordinary plant.

The scientists sequenced the benth's genome making it a roadmap for biologists and biotechnologists who are searching for ways to produce antibodies, vaccines and therapeutics against viruses like COVID-19. The research team has made their unpublished information available to other scientific teams to allow them to change the genome and develop a much-awaited vaccine against the dreaded virus. Benth is now being used all over the world as the potential vaccine's plant biofactory to develop protein-based diagnostic products and vaccines in bulk quantities at a low cost.

The availability of the benth genome sequence information is timely and the scientists are optimistic about reaching this new level of understanding of biofactories as the battle against COVID-19 progresses. Their efforts have provided new and improved ways to meet the current and future challenges. Beyond COVID -19, the scientists said that there will always be a need to immediately respond to new strains of viruses that may emerge in the future.

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