

CROP CIRCULAR

ISSUE 8
2020

CropLife

SOUTH AFRICA SUID-AFRIKA



IN THIS ISSUE

- Play it safe with pesticide MRLs
- Collaboration to ensure pollinator safety
- Preserving Bt technology through stewardship

CONTRIBUTE

We are always looking for news, photographs or event updates from our members.

Please forward your contributions to elriza@croplife.co.za

WELCOME

Well, 2020 has certainly turned out to have been an interesting year! We started the year with expectations of a mediocre growing season, but thankfully better than expected rainfall was received in the summer rainfall growing areas from January onwards, with the result being a very good season.

This positive trend continued into the winter rainfall growing areas where very welcome rainfall not only broke the cycle of many years of drought, but also brought relief in the form of filling dams.

The rainfall has, however, not brought relief to the entire country and we need to recognise the challenges that many farmers still have in certain dry parts.

Then we were hit with the COVID-19 pandemic. Wow – what a ride that is proving to be! Thankfully, our industry was deemed to be an “essential service” and with help from affiliated organisations, CropLife SA was able to provide its members with guidance on how to operate during the national lockdown.

This certainly assisted in securing significant crop harvests and allowed our member companies to remain operational and financially viable. Not all industries or companies have been this lucky, with many people losing their jobs during this period.

There have also been very sad reports of people in our industry, or family members of people in our industry, losing their lives to COVID-19 induced health complications. The CropLife SA family extends its sincere condolences to all impacted in this way.

As the year continued, thankfully good rains have been received over many parts of the summer rainfall region of our country. This resulted in many CropLife SA member companies reporting great sales in the first part of the growing season. Long may this situation last.

Statistics South Africa released its GDP report for the first three quarters of 2020 on 8 December 2020 with the following extract being relevant: *“Despite all industries recording positive results in the third quarter, agriculture and government are the only two that have so far weathered the effects of the pandemic. Comparing the level of economic activity in the first three quarters of 2020 with the first three quarters of 2019 (not annualised), agriculture has grown by 11,3% while government is marginally up by 0,8%. All other industries are down, with construction (-20,0%), transport and communication (-15,6%), and manufacturing (-14,9%) the worst affected”.*

I am very proud of what the CropLife SA team has achieved with its efforts and initiatives in this past year, and the team has great ideas to implement in 2021 with a view to continuously improve the services provided to member companies.

On behalf of the CropLife SA team, I would like to take the opportunity to wish all member companies and their staff a happy holiday with our best wishes for a healthy and successful 2021 for all. Stay safe.



Rod Bell
Chief Executive Officer
CropLife South Africa

CONTENT

3

Evolving biotechnology and how it complements IPM programmes for sustainable agriculture

6

Launch of new user system on Agri-Intel

7

2020 Agricultural Writers SA Awards

8

Understanding your association

10

Genome editing
The next generation of modern plant breeding

12

Play it safe with pesticide MRLs

13

Protecting our pollinators

15

Ten commandments for responsible pesticide use

16

Collaboration to ensure pollinator safety

17

Critical pest alert: Cutworms

18

Safety of farm workers handling pesticides not negotiable

20

Preserving Bt technology through stewardship

22

Wurmplae wat kan pla

24

Critical pest alert: Migratory locusts

25

Maximum residue limits (MRL's) unpacked

26

Connect with Us

Evolving biotechnology and how it complements IPM programmes for sustainable agriculture

Kobus Meintjes
Vice President
CropLife SA

Earlier this year, Chantel Arendse joined the CropLife SA team as the Lead for Plant Biotechnology. Many might ask why CropLife SA would require such an appointment.

The reason is because of the emphasis on the convergence in the agricultural industry and CropLife SA's commitment to working towards integrated pest management (IPM) solutions that can drive sustainable progress in agriculture.

Biotechnology is a method of transferring beneficial genes directly into a plant, allowing for more efficiency and new opportunities to improve crops. This process is called genetic modification, and the result is a genetically modified organism (GMO), or genetically modified seed (GM seed).

The detection and spread of fall armyworm (FAW) in Sub-Saharan Africa in the recent past, and resistance development of lepidopteran pests to 'Bt maize' and some insecticides have created unique challenges in Africa that have a major impact on food security and sustainable agriculture. It has highlighted the need for barriers between agricultural biotechnology and the traditional crop protection industry to be removed to enable the provision of integrated crop solutions to South African farmers.

Biotechnology was first commercially introduced and widely adopted in 1996. From then until 2015, 26 plant species have been modified and approved for commercial release to help growers fight against weeds, insects and diseases, but the biggest crops where this technology is used today is still in row crops like maize, soybeans and cotton.

Biotech traits (insect resistant maize and cotton) were first commercialised in South Africa in 1997, whereas herbicide tolerant crops were commercialised in 2001.

Since these crops are grown on millions of hectares globally, biotechnology has helped to reduce the use of pesticides as part of the IPM approach to ensure sustainable agriculture. According to James and Barfoot (2020), the adoption of GM insect resistant and herbicide tolerant traits has decreased the environmental impact associated with herbicide and insecticide use on these hectares by 18.4%.

Besides having a direct impact on the volume of pesticides being used, biotechnology has also enabled different management practices. One of the biggest changes has been the introduction of no and minimum tillage practices. The technology has also facilitated important cuts in fuel use, resulting in a significant reduction in the release of greenhouse gas emissions from the GM cropping area. As can be seen in figure 1, this reduction is equivalent to removing 12 million vehicles from the road for 1 year (ISAAA).

CRISPR is an exciting and efficient new tool to provide solutions to these evolving challenges. With CRISPR, it's possible to enable gene editing to make specific and exact changes in a plant by deleting, moving or editing a gene in the plant's own DNA to achieve a specific characteristic - such as drought resistance, disease tolerance or improved nutritional value. Furthermore, CRISPR is part of emerging plant breeding innovation tools that are not classified as Genetically Modified Organisms (GMOs). CRISPR also has promise for advances with additional consumer benefits such as low gluten wheat or improved flavour in decaffeinated coffees, and fruit that is better able to shield itself from fungus and disease.

CRISPR may also bring environmental benefits such as crops that need less water and are more productive or crop protection products that are 'greener' and can be used in lower amounts.

CONTRIBUTION OF BIOTECH CROPS TO SUSTAINABILITY

INCREASES CROP PRODUCTIVITY

contributes to **food, feed, & fiber** security



more **affordable food**
reduced production costs



LESS

ploughing
pesticide sprays
labor
US\$150 BILLION
farm income gains in 1996-2014
GENERATED GLOBALLY BY
BIOTECH CROPS

HELPS CONSERVE BIODIVERSITY

land-saving technology



higher **productivity**



on world's
1.5 BILLION
hectares of
arable land

prevents
deforestation
protects
biodiversity

REDUCES AGRICULTURE'S ECO-FOOTPRINT

lowers **CO2** emissions



in 1996-2014, pesticide
spraying reduced by
583.5 million kg

decreased environmental
impact from herbicide &
insecticide use by **18.5%**

use of **herbicide tolerant
biotech crops** conserves
soil moisture

savings on
fossil fuels



HELPS MITIGATE CLIMATE CHANGE

fewer **herbicide &
insecticide** applications



reduced **CO2 emissions**
equivalent to removing
12 MILLION CARS
from the road for **1 YEAR**



CONTRIBUTES TO THE ALLEVIATION OF POVERTY AND HUNGER

better **livelihoods** from **higher yields**

~18 million farmers in **28 countries**
planted **biotech crops** in 2015



90%
small, resource-poor
farmers from
developing countries

biotech crops help farmers **earn reasonable incomes**

biotech **cotton** has made
significant contribution to the incomes of

~16.5 MILLION
farmers and their families in
**CHINA, INDIA, PAKISTAN, MYANMAR,
BURKINA FASO, & SOUTH AFRICA**



SOURCES:
Brookes, Graham and Peter Barfoot. 2016.
James, Clive. 2015. 20th Anniversary (1996 to 2015) of the Global Commercialization of
Biotech Crops and Biotech Crop Highlights in 2015. ISAAA Brief No. 51. ISAAA: Ithaca,
New York.

For more information, visit ISAAA website:

www.isaaa.org

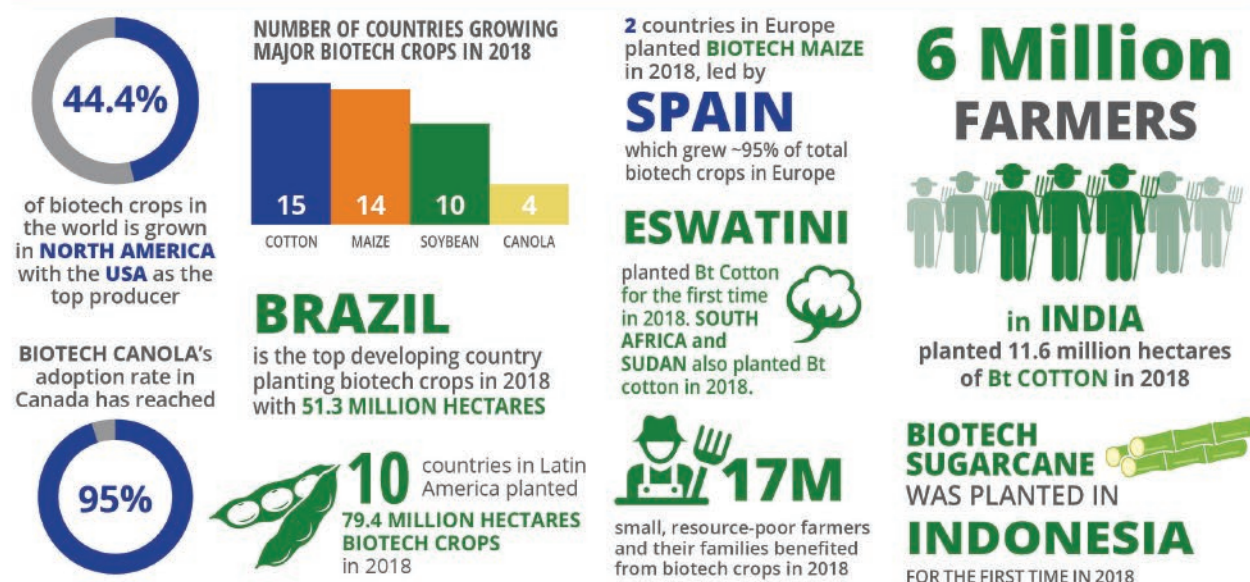
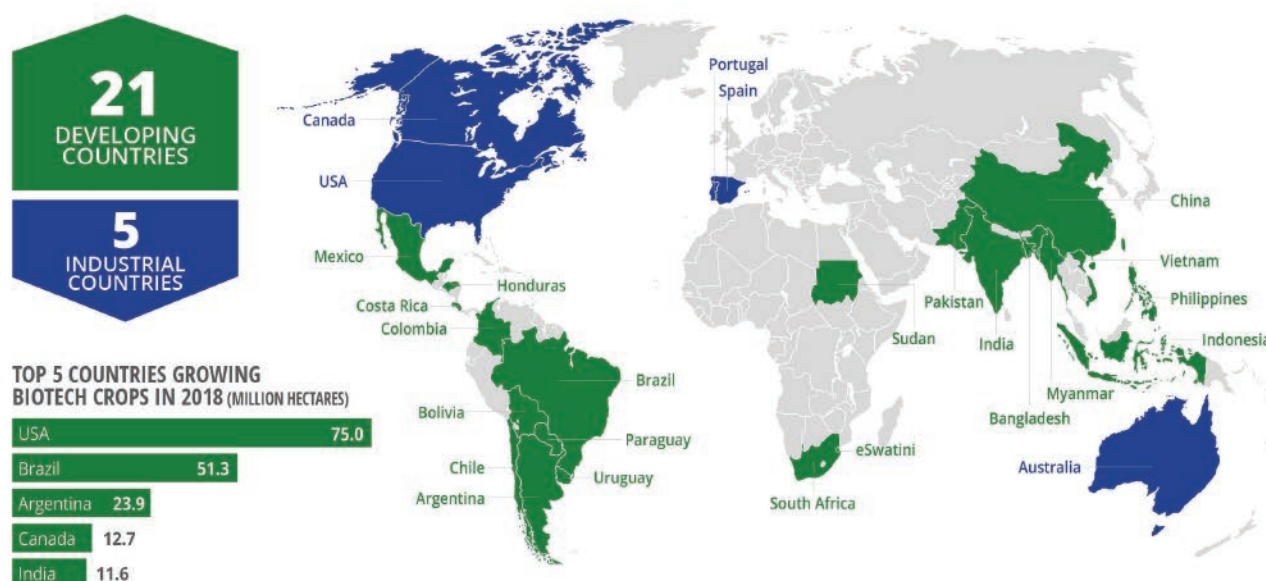


Figure 1: ISAAA Contribution of Biotech Crops to Sustainability

Even though GMO crops have been considered as the fastest growing crop technology with 191.7M hectares grown in 26 countries in 2018 (Figure 2. ISAAA, 2018), there is still resistance to the technology in some regions. Stefaan Blancke (2015) believes this is driven by emotional responses in reaction to unsubstantiated GMO-messages. Given the benefits of this technology, education is needed from a young age to tackle these misconceptions.

Where are Biotech Crops Grown in the World?

26 countries planted 191.7 million hectares of biotech crops in 2018, the 23rd year of global commercialization of biotech crops



For more information, visit ISAAA website:
www.isaaa.org

Source: ISAAA, 2018. Global Status of Commercialized Biotech/GM Crops in 2018. ISAAA Brief No. 54.



#GMCrops2018
#ISAAAReport2018

Figure 2: ISAAA Where Are Biotech Crops Grown in the World

As we all know, crops are dynamic systems and with the challenges in changing climatic conditions, the needs of farmers are constantly evolving. Because of these changing demands, biotech companies are using the technology to develop new traits to address these needs. The focus is not only on biotic needs (weeds, insects and diseases) but also on abiotic challenges like drought tolerance. These new traits are a great tool that farmers can incorporate along with traditional plant protection products, biological solutions and seed applied technologies in an integrated approach to manage their crops in a sustainable way.

A recent example of how farmers are benefiting from these trait solutions is how they were able to use traits with increased durability to manage fall armyworm when it was introduced in SA in 2018. In the same way, new traits that enable different weed control systems have helped farmers in the US and Latin America to control glyphosate tolerant weeds that are threatening their ability to manage their crops sustainably.

The challenge that growers face remains – how are they be able to produce more food with less resources, and less agricultural land being available due to competition with other needs (urbanisation, housing need/population growth, mining, etc.)? Coupled with these challenges, agricultural production needs to keep in touch with changing dietary requirements.

CropLife SA is glad to be part of, and supports, the continuous development and integration of all the beneficial technologies available to growers. Many technologies that are game changers in food production and agricultural productivity are coming to the fore at a fast pace, and CropLife South Africa aims to work with all stakeholders (authorities, industry partners, growers, civil society, etc.) to ensure that the various technologies are introduced in a responsible manner that will benefit the society at large. At the same time, it is critical that Africa must not lose the latest technological wave (as we missed the green revolution train) by ensuring that regulatory policies that govern agricultural technology should weigh both risks and benefits of introduced technologies as opposed to only measuring the potential hazards.

References

Graham Brookes, Peter Barfoot. (2020) *Environmental impacts of genetically modified (GM) crop use 1996–2018: impacts on pesticide use and carbon emissions*. GM Crops & Food 11:4, pages 215–241.

ISAAA infographic. Brookes, Graham and Peter Barfoot. (2016)

James, Clive. (2015) *20th Anniversary (1996 to 2015) of the Global Commercialization of Biotech Crop and Biotech Crop Highlights in 2015*. ISAAA Brief No. 51. ISAAA: Ithaca, New York

ISAAA (2018) *Global status of commercialized Biotech / GM crops: 2018*. ISAAA Brief No. 54 ISAAA: Ithaca, NY

Blancke, Stefaan. (2015) *Why people oppose GMOs even though science says they are safe*. Scientific American, 18 August 2015.

Launch of new user system on Agri-Intel

Agri-Intel launched its new user-pay system on 2 November. All users needed to be deleted from the system to make way for the new platform, so all users will need to register on the website again should they wish to continue using Agri-Intel and its services.

Chana-Lee White
Agri-Intel Manager

The new registration process is an easy step by step process and each user must register their own profile with username and password. Users who are employed by CropLife SA member companies will still receive free access to the website. Individuals who are not working for CropLife SA member companies, both in South Africa and abroad, will be required to pay an annual fee.

The fees for Agri-Intel are as follows:

	Access to both Label database and Residue Management (annual fee per user)	Access to Residue management only (annual fee per user)
CropLife SA members	Free	Free
Non-CropLife SA members residing in SA	R1800	R1000
International users	\$500 or €400*	\$300 or €250*

If there are more than three users who would like to sign up for a bulk discount, please contact Chana-Lee White (chana@croplife.co.za).

As 2020 draws to a close, 2021 has something to look forward to. The new year will see the launch of the new weed species section on Agri-Intel, so please be on the lookout for future communication regarding launch dates.

2020 Agricultural Writers SA Awards: A tribute to the heroes of agriculture

South Africa's contributors to agriculture in a time of crisis have been recognised at the Agricultural Writers SA Awards on 13 November in a virtual event dedicated to the heroes of agriculture in 2020. The reason for the change in theme of the awards, which traditionally presented the farmer, agriculturalist and new entrant to commercial agriculture of the year awards, was to honour the agricultural community for the way in which it came together to overcome the challenges posed by the COVID-19 pandemic and the consequent national lockdown.

"The event was on the brink of being cancelled altogether but we realised that in a year such as this that was so difficult, yet so many rallied together to help where it was needed, we couldn't but use our platform to pay tribute to the industry. There were so many farmers, agricultural companies and associations that contributed to helping communities in need, near and far, assisting fellow farmers and wherever there was help needed. They not only clothed and fed the nation but kept the economy afloat," said chairperson of the Agricultural Writers of SA, Liza Bohlmann.

In addition, members were honoured for their role in communicating issues of interest to the agricultural sector and aiding in responsible communication of the sector.

CropLife South Africa was proud to sponsor the award for best crop protection article once again this year, as well as introduce a new category for best plant biotechnology article.

The purpose of these awards is to encourage agricultural journalists to report on matters pertaining to crop protection and plant biotechnology in an accurate, relevant and educational manner so that South African farmers can reap the rewards that these technologies offer and continue to produce food safely and sustainably.

The criteria used to adjudicate the articles were relevance to the industry, comprehensibility, technical accuracy and percentage of the article dedicated to crop protection or plant biotechnology.

The winners were Gerrit Bezuidenhout in the crop protection category (photo on the right), for his article entitled *Maak seker van jou spuittegnologie* which was published in Landbouweekblad and Carin Venter in the plant biotechnology category for her article, *An Overview of GMOs in South Africa*, published in FarmBiz.



Commenting on CropLife SA's launch of the new category, Chantel Arendse (Lead for Plant Biotechnology) remarked that "Plant biotechnology has proven its value in agriculture and these awards form the ideal platform to inspire agricultural journalists to learn about how the technology contributes to affordable and sustainable food production and benefits farmer livelihoods and the environment."

Understanding your association

Rod Bell
Chief Executive
Officer

During interactions with member companies and their staff during 2020, some misconceptions about the CropLife SA association were encountered and as a result, we will provide some background about your association in this and future newsletters.

The objective of this is to ensure that all members and their staff understand how the association is run, how the CropLife SA team is mandated to operate and what you can expect from your association.

In this edition, we look at how the CropLife SA association is managed and how the rules are set for the crop adviser CPD programme.

Who sets the strategic direction for the association?

A 12 person Executive Council (ExCo) is elected each year during the annual general meeting.

Election of ExCo

Each paid-up supplier and distributor member company is given the opportunity to nominate, and then vote for, a person from a member company to represent them on the ExCo.

Eight persons representing supplier member companies (four each from the two different groupings of supplier member companies) and four persons representing distributor member companies are voted onto the ExCo.

In this way, all categories of CropLife SA membership are represented. Once elected, the ExCo meets and votes for a President and Vice President for the association from within the newly elected ExCo.

In addition, two members from ExCo then join the CEO and Finance Officer of the CropLife SA team to form the finance committee (FinCom). FinCom is charged with monitoring the finances of the association. ExCo and FinCom meet once per quarter to discuss strategic matters, rules for the association's programmes, review of the finances and so forth.

It is the ExCo of your association that provides the strategy and direction for the association, and the CropLife SA team is mandated to put the ExCo's plans into action.



**WE INFORM
WE EDUCATE
WE REGULATE
WE PROMOTE**

Who sets the rules for the continuous professional development (CPD) programme for crop advisers of distributor member companies?

A number of years ago, CropLife SA implemented a CPD programme for sales agents affiliated with CropLife SA distributor member companies. This programme and its associated rules are based on SANS 1606 – a South African National Standard entitled “Accreditation of distributors of agricultural remedies for agricultural use”.

SANS 1606 has a number of requirements for training, with a few listed below for illustration purposes:

- training specific to products, crops, pests, diseases and weeds
- training relevant to the business of the distributor
- compulsory training related to health, safety and environmental issues
- industry-related activities
- industry-specific legislation

SANS 1606 also stipulates that a CPD programme must include a points system wherein points are awarded based on the duration of the course, training or activity. The duration of the courses or training serves as a guideline to the number of points earned. One hour of training counts for one CPD point and the points are calculated based on the duration of the course.

SANS 1606 further includes requirements for distributors, with some being included again for illustration purposes. It states that distributors of agricultural remedies shall:

- Implement an awareness programme on the safe handling and disposal of empty containers.
- Inform and train clients and their personnel on safety, health and environmental issues regarding agricultural remedies and their use.
- Develop and implement a continuing professional development programme that meets the requirements as set out in the training requirements and ensure that the continuing professional development programme is adhered to at all times.
- Implement and maintain the duty of care system.
- Ensure that all applicable laws and by-laws are identified and complied with.
- Offer product and safety training to clients and their personnel. Training shall include waste management, safe handling and storage of remedies and other relevant training.

From the above it should be clear that the CropLife SA team takes its directive from the Executive Council as chosen by its members, and that all rules pertaining to the CPD programme are in accordance with SANS 1606.

We hope that this clarifies some of the uncertainties that may have not been addressed yet.

Please note that the CropLife SA office will be closed from midday 24 December 2020 until 3 January 2021. All Agri-Intel registrations received during this time will be processed in the new year.

Genome editing - The next generation of modern plant breeding

Chantel Arendse
Lead: Plant Biotechnology

Humans have been altering the genomes of species for thousands of years. Initially, this was achieved through selective breeding to produce plant and animal varieties with superior characteristics.

However, the arrival of genetic engineering tools in the 1970's, involving the direct manipulation of DNA by humans outside of breeding and mutations, opened up a new realm of possibilities.

Genome editing – what is it and how does the technology work?

The next generation of modern breeding has arrived in the form of highly versatile genome editing (GE) technologies commonly also referred to as new breeding techniques (NBT). Gene editing tools work like molecular scissors by making site-specific cuts in an organism's genome, allowing the genome sequence to be edited in the interest of introducing a desirable characteristic.

Genome editing introduces additional genetic variations in an organism's genome by making precise changes that modify, silence, insert or remove gene activity. There are several categories of genome editing tools available in the plant breeding innovation toolbox. However, the most widely used applications in agriculture include the CRISPR/Cas9 (Clustered Regularly Interspaced Short Palindromic Repeats - Associated Protein 9) tool and TALENs (Transcription Activator-like Effector Nucleases).

Gene editing tools offer several advantages over traditional breeding and genetic modification in that it allows development of new varieties with extreme precision, improved breeding efficiency (reduced time and cost) and the ability to introduce greater genetic variation for a wider range of desirable traits in both plants and animals. Gene editing is considered a valuable and complementary addition to modern plant breeding practices, with the ability to accelerate it into the future.

While genome editing technologies have only taken off in the last 15 years or so, expectations are high that it will revolutionise agricultural production and help to address global food challenges. Utilisation of these innovative technologies in plant science research has increased exponentially, promising to deliver benefits to both farmers and consumers. Potential products in the pipeline include wheat with reduced gluten content, non-browning mushrooms, soybeans with reduced unhealthy fats, higher yielding tomatoes, grain crops that are tolerant to extreme climatic conditions and various fruits with improved resistance to devastating pests.

In recognition of the ground-breaking nature of genome editing tools, in October 2020 two scientists, Emmanuelle Charpentier and Jennifer A. Doudna, received top honours and were jointly awarded the Nobel prize in chemistry for their discovery of the CRISPR-Cas9 technology in 2012.

Regulatory conundrum

The breeding objectives for new breeding techniques are not completely different from those pursued with conventional plant breeding practices, however, the regulation of NBT products is complicated by the fact that:

1. Some genome edited crops may be similar to or indistinguishable from those crops that could occur in nature or be produced by conventional breeding practices; and
2. Some types of GE crops are free from “foreign” DNA (transgenes) and therefore not considered to be genetically modified plants.

The regulatory status of crops developed via genome editing is still under discussion globally, however, for those countries that have provided clarity on the regulatory status of genome edited products, it is becoming clear that a patchwork of inconsistent regulatory approaches towards GE is emerging that either regulates all GE crops as GMOs under existing GM legislation or does not regulate GE crops unless foreign DNA is present.

The challenge of subjecting GE crops to different regulations in various countries will likely result in potential trade issues and enforcement problems globally. CropLife International has therefore taken the position that the regulation of GE derived products should be based on the safety and characteristics of the final product rather than the breeding process used for its development. Furthermore, it advocates for the adoption of a GE regulatory approach that is globally harmonised, based on sound scientific principles and proportional to potential new safety concerns of the product.

Onerous regulatory requirements for GE products that are not directed at enhancing product safety, runs the risk of disrupting international trade, stifling innovation and delaying access to products of these innovative technologies.



GE regulatory status on the continent

The ongoing COVID-19 pandemic in 2020 and related impact on trade seem to have galvanised several African countries to move forward with their biosafety regulatory frameworks in the interest of national food sovereignty. This is good news in that it opens the regulatory pathway for the next generation of modern breeding technologies such as genome editing. Currently Nigeria and Kenya lead the continent with the drafting of their genome editing regulatory policy that, at initial glance, shows positive alignment with regulatory approaches adopted globally.

In South Africa, which has the most experience with the regulation and commercialisation of GM crops, a policy position on how GE will be regulated is not yet available. While deliberations amongst SA regulators on genome editing continues, CropLife SA, supported by its members and collaborating partners, remains ready to lend expertise to this process to ensure a policy outcome that is consistent with sound scientific principles, product safety and which provides an enabling environment for farmers to access these technology innovations to farm for the future.

Play it safe with pesticide MRLs

Gerhard Verdoorn
AgriAbout
October

Modern farming is a blend of science, innovation, business, and an unhealthy dosage

of politics. The politics in the food arena pose a significant challenge for farmers because certifying agencies, retailers and fresh produce markets all compete for market share and use certain tools to get a competitive advantage. One such tool is the maximum residue limit (MRL) that is a standard quantity of a pesticide residue that may be present on an edible crop at the time of harvest. The MRL is set by the Department of Health in terms of the Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act No. 54 of 1972) and is published as a regulation in the Government Gazette.

An MRL is set for every crop and every active ingredient that is registered for use on the crop in terms of the Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947). To arrive at an MRL for an active ingredient requires a lot of scientific studies on the toxicology of the substance, its prevalence in foodstuffs and safety margins that are calculated by toxicologists. The safety factor in turn is influenced by the food basket of the region and that is why there is hardly ever a global MRL for a substance in a foodstuff. People in South Africa may consume far less potatoes than in another country and thus the MRL for a substance on potatoes in South Africa may be higher than in that other country.

The effects of secondary regulators

Secondary regulators often set their own standards for MRLs in fresh produce as a marketing tool to convince their clients that their food is “safer” than that of their competitors. It is quite disingenuous of the secondary regulators to make such claims because clients are ill-informed about the issue of pesticide residues in foodstuffs.

Consumers believe that a pesticide residue in food poses a risk to themselves without being afforded all the facts to evaluate the risk potential. Yet, secondary regulators impose their own MRLs on farmers without sound scientific reason for such decisions. It becomes quite a nightmare for farmers to stay abreast of all the developments and changes in MRLs, and sometimes they are caught off-guard by such changes. Farmers who produce fresh produce for local consumption and for export need a tool to guide them on their pest, disease and weed management programmes so that their produce meets the requirements of the legislated MRLs and those of the secondary regulators. That tool may be in the form of a specialist consultant who really knows the markets and all their requirements, or it may also be a self-help tool that guides the farmer on market requirements in terms of MRLs.

The South African MRL for a substance corresponds with a pre-harvest interval that is stated on the label of the substance. It means if a farmer applies the substance (pesticide) according to the label instructions, the residue of the substance should not exceed the MRL. Planning a spray programme is thus especially important for the farmer. However, if the produce is to be supplied to an overseas market or a local market who plays the role of a secondary regulator that demands residues lower than the national MRL, the farmer will have to adjust the spray programme to meet the MRL requirements of the secondary regulator.

The question from consumers and lobbyists is why the South African MRLs for many compounds are higher than the European Union MRLs? Is it a case of South Africans being less “important” in terms of pesticide safety than people living in European countries? No, it is very often the market forces as explained above that drive MRLs down. South African MRLs are generally on par with other countries, but there is a definite increase in the number of MRL issues for farmers who export to the EU.

Mancozeb is one such an example where the compound is up for review and there is a possibility that the product may be prohibited in the EU. When that directive hit the public domain, it created chaos in the market. Local wine cellars immediately wanted to safeguard their market interest in the EU and informed wine grape producers that mancozeb may no longer be used.

That was the wrong message because no decision has been taken yet, and if the EU decides to prohibit the use of mancozeb in the EU there is a strong likelihood that there will still be a MRL value for produce imported into the EU, albeit lower than the current value. That means that farmers will still be able to use mancozeb, but will have to adjust their spray programmes, so their produce do not exceed the new MRL for mancozeb.



The safety factor

Most people do not know much about MRLs and pesticide safety. The MRL is directly correlated to the Allowed Daily Intake (ADI) and the No Observed Effect Level (NOEL). The NOEL is the amount of the substance that can be consumed over at least a two-year period, expressed as mg per kg body mass per day (mg/kg b.w. daily) while the ADI is the maximum recommended daily consumption of a substance that is expressed also as mg/kg b.w. daily. To play it safe, food safety regulators use the NOEL divided by 100 as the ADI. That means, that even if a person ingests ten times more of the substance per day than what the ADI is, they are at no risk. Food safety experts and toxicologists use these values along with the food basket of the region to determine an MRL for the substance on each crop. If farmers produce their crops in such a way that the residues do not exceed the MRL, that food is deemed totally safe for human consumption.

Information on MRLS

Farmers can sign up and use CropLife SA's Agri-Intel database www.agri-intel.com that incorporates more than 95% of all pesticides that are registered in South Africa. It has a section dedicated to MRLs which seems a bit daunting to use at first glance, but once one starts interrogating the MRL section, it becomes easy to use. The advantage is that it lists the South African MRLs, EU MRLs and the MRLs of secondary regulators. Along with that is the PHI and explanatory notes to guide a producer to the requirements of the export destination. With all that information available, a farmer can work out exactly what needs to be done to protect the crop and remain within the strict parameters of the MRL arena.

Protecting our pollinators

It is no secret that pollinators play a crucial role in sustainable agriculture and no one should be more aware of this than producers. There are, however, still incidents where pollinators are adversely affected by the improper use of pesticides. Why is this still the case?

Elriza Theron
SA Grain
October

In South Africa, pesticides can only be registered after a rigorous review of the product's toxicology, which includes the review and approval of comprehensive efficacy, residue, stability and plant compatibility studies that need to be submitted. Furthermore, the label-directed use of the product should not pose an unacceptable risk to human and environmental health, which includes pollinator safety. Only once the Registrar of Act No. 36 of 1947 (Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act) is satisfied that these criteria have been met, will registration be granted.

The application of any pesticide, whether commercial or household, must follow the label instructions to the tee. The off-label use as well as the acquisition, disposal or sale of an agricultural remedy for a purpose or in a manner other than that specified on the label, are illegal as per Regulation No. R1716 of 26 July 1991 under Act No. 36 of 1947.

If the regulatory environment ensures that all these checks and balances are in place to protect our pollinators, then we need to ensure that the pesticides are applied accordingly. This means that the crop adviser and the producer must ensure the products are only used according to label instructions. Any other application is not only illegal, but could have dire consequences for pollinators.

The following points must be kept in mind when developing a spray programme by both crop advisers or sales agents and producers:

Do's

- Always follow the label instructions and pay special attention to pollinator warnings or instructions.
- Consult Agri-Intel (www.agri-intel.com) for pesticides that are registered for the purposes required. The labels are, however, the final port of call for safety and use instructions.
- Apply directly to the target and ensure minimal spray drift.
- Apply early evening when bees have returned to their hives or early morning before bees start to work.
- Communicate with all beekeepers in the area and inform them of planned spray programmes.
- Scout the area for pollinators before applying.
- Be aware of residues and the amount of time it may still be toxic to bees. Remember that systemic insecticides have long periods of residual activity.
- Ensure that flowering plants or weeds that are attractive to bees are not in the area of application.
- Familiarise yourself with the product. Insecticides are the most hazardous to bees while fungicides and plant growth regulators have less impact.
- Ensure that equipment has been correctly calibrated for the application.
- Practise integrated pest management and only apply pesticides when absolutely necessary.

Don'ts

- Do not apply directly onto flowers. If no other option exists but to apply pesticides in bloom, direct application onto flowers should be avoided.
- Avoid application while pollinators are active in the area that needs to be treated.
- Do not apply at night because inversion can prevent successful deposition of pesticides onto the target and cause serious drift.
- Refrain from applying any product that is not registered for the specific crop or application method.
- Do not apply during windy conditions, especially if foliar application is the only available option.
- Don't mix pesticides with substances that could be a lure for pollinators.
- Do not add adjuvants to fungicide applications during bloom or where there is pollinator activity in the field.
- Refrain from applying toxic pesticides to standing bodies of water.

It is important to note that even though a pesticide may be toxic to bees when ingested, it does not mean that it cannot be applied safely. This is the difference between a hazard and a risk. Take bleach as an example. Bleach, whether standing on a kitchen counter or locked away in an impenetrable vault, is a hazard because it can be toxic to humans. However, it only becomes a risk if one decides to drink it. It is the same scenario with pesticides and pollinators, which is why field trials are so important to determine whether bees could be exposed or affected. Most pesticides pose very little risk to bees once the spray is dried off on the plant surface.

Another key point to ensure pollinator safety is effective and timeous communication between producers and beekeepers. Not only does the producer need to inform beekeepers in the area of intended spray programmes, but beekeepers also need to inform the producer about their intended activities.

Just as we need to protect our crops from devastating pests, we need to nurture and protect our pollinators. Each role-player needs to be extra vigilant and take extreme precautions with regard to crop protection application.

The pollinator do's and don'ts poster can be downloaded at www.croplife.co.za/PollinatorPoster

Ten commandments for responsible pesticide use

Gerhard Verdoorn
Cotton SA
October

1. Plan your production season carefully and only buy the pesticides and volumes that you will definitely need. Do not just buy a product because it is offered at a lower price, as it may accumulate only to have to be destroyed at a tremendous cost.
2. Only buy registered pesticides from recognised dealers, preferably agents that are affiliated with CropLife SA distributor companies, to ensure that you buy good quality, legal products. If a pesticide does not display a registration number on the front panel of the label, then it is illegal in South Africa. These registration numbers start with a capital letter L, followed by four numbers, for example L1234, and after that "Act No. 36 of 1947".
3. Store your pesticides in a proper storeroom built with bricks or concrete, a roof, sufficient ventilation, lighting, and a lockable door. Many malicious poisonings happen with agrochemicals that have been stolen from farmers.
4. Study the label of every agrochemical carefully and only apply it according to the prescribed instructions. Regulation No. R1716 of 26 July 1992 warns that the use of an agrochemical for any other purpose or in any other manner than what is prescribed, is a punishable violation of Act No. 36 of 1947.
5. Provide your farmworkers with basic training about the safe and responsible use of pesticides.



A typical label of a registered insecticide.

6. Supply farmworkers who mix and apply pesticides with protective clothing such as face masks, cloth hats, overalls with long sleeves and long pants, rubber boots, and rubber gloves. Ensure that they always wear their protective clothing, even the tractor operator. It is necessary to protect them from splashes, mists and oral ingestion of pesticides and spray mixtures.
7. Calibrate the spray equipment to apply the correct dosage of pesticides. This includes examining the spray heads to ensure that they are not eroded or blocked. Consult your agrochemical agent for calibration advice.
8. Pesticides must only be applied if weather conditions are favourable. If the south-easter rears its head, or the highveld thunderclouds are about to explode, or if it is so hot that everything evaporates, then it is time to halt pesticide application for a while.
9. Once the pesticide containers are empty, they need to be triple rinsed with one quarter volume fresh water and the rinse water must be decanted into the spray tank. Containers should be left to dry and afterwards, pierced or cut into pieces before handing it over to a CropLife SA-approved collector or recycler.
10. Avoid any malicious misuse of pesticides such as poisoning of animals. Not only is this illegal and inhumane, but it also poses a secondary poisoning risk to other animals. Some species, such as vultures, have already been dealt a huge blow through poisonings.

Collaboration to ensure pollinator safety

Elriza Theron
AgriAbout
November

The crop protection industry, together with a number of grower and beekeeping associations, have committed to ensuring that their activities are conducted in such a way that pollinator safety is a key priority.

To this end, a pollinator charter was created in which all parties involved agreed that their members shall adhere to the guidelines provided in the charter. These parties include CropLife SA, Agri SA, Grain SA, SABIO, Hortgro, SAMAC, SANSOR, Subtrop, and Citrus Research International.

“Bees form such a critical component of biodiversity and food production that we owe them all the protection we can afford. By strictly following label directives, adhering to bee safeguarding protocols and establishing information networks between beekeepers and crop farmers, we can prevent pesticide impacts on bees. It needs a total commitment from the crop production, plant protection and beekeeping sectors to achieve this objective” says dr. Gerhard Verdoorn, operations and stewardship manager of CropLife SA, the association representing the crop protection industry.

The charter states that growers and the crop protection industry shall only recommend or apply crop protection products that are registered according to Act 36 of 1947, as prescribed by the label, and within an integrated pest management programme. In addition, they will ensure that measures are taken to minimise dust resulting from treated seed, and to avoid spraying when bees are foraging, unless absolutely necessary and only with products which are explicitly designed for bee-safe application during flowering.

Commenting on behalf of the macadamia industry, Schalk Schoeman, research extension manager at SAMAC says: “We acknowledge the importance of bees for the macadamia industry. Macadamia pollen is sticky and is not easily dispersed by wind. Clearly invertebrates and more particularly honeybees, play an intrinsic role in dispersing pollen and should



be regarded as very important allies in sustainable macadamia production. To further this, SAMAC is currently funding a number of projects focussing on honeybees and growers are actively discouraged from using products that may harm bees during or just after flowering. Environmental sustainability is a key aspect of macadamia farming in South Africa, therefore SAMAC proudly endorses the new pollinator charter."

In addition to the macadamia industry, pollinators play a critical role in deciduous fruit, citrus, vineyards, canola and even sunflower production. "Pollination and the wellbeing of bees during their brief, yet vital sojourn in orchards, is critical to the pome and stone fruit industry. The deciduous fruit industry is fully committed to the pollination charter and recognises the role of the grower in ensuring pollinator safety", says Hugh Campbell, general manager of Hortgro Science.

Another key point is effective and timeous communication between growers and beekeepers. This is why the charter includes an undertaking from pollinators and bee farmers to formalise the relationship with the farmer or landowner, to communicate with growers and other pollinators about their intended activities, and to ensure good hive management practices. This model of collaboration among multiple stakeholders is an important step in the right direction to highlight the responsibilities of all parties to ensure bee health.

The pollinator charter can be downloaded at www.croplife.co.za/PollinatorCharter

Critical pest alert: Cutworms

Excerpts in Harvest SA, Landbou.com, ProAgri Farmer's Weekly, AgTag, Senwes, AgriAbout and Landbouweekblad

CropLife SA received a large number of calls from small and commercial farmers about cutworm outbreaks over the past two weeks.

KwaZulu-Natal, Limpopo, western parts of Mpumalanga, northern and eastern parts of Gauteng, the Free State and parts of the Eastern Cape seem to have the largest infestation of cutworms.

This widespread and very common plant pest is a typical *Lepidoptera* pest that starts with moth clouds that invade crop areas. Once they have mated and laid their eggs, the pest proliferates, and the huge larvae begin to attack any young plants.

Maize farmers in KwaZulu-Natal reported large-scale damage to newly planted maize while Free State farmers noticed massive numbers of different cutworm species while preparing seedbeds for planting. Small farmers in KwaMhlanga, northern KwaZulu-Natal, the Mpumalanga Lowveld, Eastern Cape and Polokwane in Limpopo also reported serious cutworm damage to vegetable crops and maize.

Early indications show that the cutworm population may have developed a certain degree of resistance to the pyrethroid insecticides that are registered to control cutworms. Farmers must apply these insecticides at the highest dosage rate as indicated on the labels, and as early as possible after the cutworms have hatched.

Cutworms develop over as many as nine instars and, like other *Lepidoptera* pests, they become increasingly difficult to control with most insecticides as they grow older. Cutworms are normally large, fat larvae ranging from pale grey to virtually black, depending on the species and region. They live just beneath the soil surface and emerge at night to forage. Moths are non-descript grey-brown.

Farmers are encouraged to take good quality photos with smartphones and send them via WhatsApp to the CropLife SA emergency number 082 446 8946 for verification by the specialist entomologists who assist CropLife SA with plant pest identification. Insecticides that are registered for the control of cutworms are listed on the CropLife SA Agri-Intel database on www.agri-intel.com.

Safety of farm workers handling pesticides not negotiable

Gerhard Verdoorn
Pula Mvula
November

In a country that is often compared to the most advanced farming nations in the world,

farm workers are an important component of the agricultural success story. A healthy work force is a valuable asset; producers need to ensure that workers do not face undue risks while working.

Pesticides – insecticides, fungicides, herbicides, plant growth regulants and adjuvants – are compounds that are potentially hazardous to human beings. Farm workers most often handle and apply these essential plant protection products, with varying levels of risk to themselves and the environment.

The safe handling of pesticides should be gospel on farms. Sometimes, however, there are incidents of undue exposure because of irresponsible practices – often with dire consequences to those who were exposed.

Limiting access is the starting point

Not all farm workers need to be involved with pest management on the farm, therefore producers should hand-pick those who show a high level of responsibility to work with pesticides.

The pesticide store manager is the first defence against any pesticide risks. He or she is responsible not only for stock control and dispensing of plant protection products, but should also oversee and supervise the preparation of spray mixtures. It is essential to equip this valuable person with the best set of personal protective clothing that money can buy.

The store manager's most important task is access control. No one apart from the store manager and the producer must have access to the pesticide store.

Using personal protective clothing is not negotiable

Certain elements of personal protection are universal for all, such as full body cover in the form of an overall (mostly good quality cotton will suffice), butylene rubber boots and long butylene rubber gloves.

A hat is highly recommended, while some form of facial cover is also required. This may be a simple eye shield to prevent spray drift from contaminating the eyes, to something more elaborate like a chemical breather mask when working with highly toxic pesticides such as methamidophos during spray mixture preparation. It is not only required to prevent the inhaling of spray mist, but also to prevent the discomfort of the putrid odour of many organophosphate insecticides. The filter canister must be replaced regularly to ensure the breather mask functions properly.

Simple protection for spray operators

The spray operator is the one who is perhaps at greatest risk of undue exposure to pesticides, because of the nature of the work. Fortunately, the risk is generally low due to the significant dilution of the pesticide in the spray tank. However, this does not warrant a slack approach.

Full body cover (overall), rubber boots, rubber gloves, hat as well as nose and mouth cover are required to keep the worker safe. Knapsack spray operators should also wear a polyethylene apron back to front to protect the back against spray mixture dripping from the knapsack. Once the work has been completed, the worker needs to clean the personal protective clothing, wash hands and face and take a shower to decontaminate the body. When working with tractor boom sprays, this set of clothing is adequate, but a mist blower requires total facial cover because inhaling the fine mist and eye contact become real risks.

Advanced protection for spray mix preparations

Preparing spray mixtures is a risky business due to the high concentration of the active ingredients in the formulation. Here the worker must wear full protection plus a facial cover and a splash-proof apron, especially when pouring liquid concentrates into measuring beakers or directly into the spray tank.

A splash of glyphosate can at worst burn the skin, but a splash of chlorpyrifos or paraquat may cause more serious problems. Prevention is better than cure. As with spray operators, such specialist workers need to clean their personal protective clothing after work and sanitise themselves properly.

No eating, drinking or smoking

Eating, drinking or smoking are high risk activities as it offers an easy conduit for pesticides to enter the body. It is best to allow ample time for the removal of gloves and facial covers, to wash the hands and face properly and then proceed to eat or drink. Food and drinks should not be allowed anywhere near a pesticide store or in fields where pesticides are being applied.

Compromised individuals must not work with pesticides

Any person will fall ill at some time or another. Ailments such as common colds, influenza and gastroenteritis are reasons for not allowing people to work with pesticides. While the body is fighting a medical condition, it may not be able to cope with even a small exposure to pesticides. The liver is a wonderful detoxification organ, but it will battle to fend off endotoxins produced by a microbial infection as well as some pesticides that enter the body.

Re-entry after spraying crops

Pesticide labels will show what the safe pre-entering interval is under Warnings and Precautions. That is to allow the pesticide molecules to metabolise sufficiently to minimise the risk to producers and farm workers. Should farm workers have to work in treated crops for whatever reason before the re-entry time has expired, they need to wear the full set of protective clothing and decontaminate themselves and their clothing afterwards.

Farm worker family safety

Most farm workers and their families live on farms and often close to crop fields. Before any spraying commences, family members should be evacuated to safe areas until the spraying has been completed.

Also warn them not to enter the treated crops for at least seven days as an additional safety measure. This is also important for their livestock, chickens and dogs – keep them out of treated areas. Instruct workers to warn passers-by to evacuate and stay away from the spray area. When applying very toxic products such as paraquat or chlorpyrifos to a crop, warning signs have to be put up to inform people that it is a high-risk area and that they must not enter or approach it.

Continued training on the safe use of pesticides

Training is a never-ending process and since these are potentially dangerous substances, farm workers need to be trained on a continuous basis to embed the principles of responsible use in their minds. Many of the CropLife SA supply and distribution members offer training or at least assist with training of producers and farm workers.

Contact your CropLife SA accredited crop adviser and ask for assistance with farm worker training. CropLife SA members have access to a series of booklets on responsible use in eight languages that are invaluable for farm worker training. Farm workers with higher education levels may even consider enrolling for the CropLife SA Basic Crop Protection course that is an online AgriSETA-accredited course. For enquiries contact CropLife SA on info@croplife.co.za or visit www.croplife.co.za.

No empty containers for farm workers

One of South Africa's worst agricultural legacies is the practice of giving empty plastic pesticide containers to farm workers. If food or beverages are stored in such containers, the outcome is a guaranteed human catastrophe. There have been a number of incidents where farm worker families have been poisoned because they used empty containers for drinking water or cooking oil. Empty containers must be triple rinsed and disposed of via one of the CropLife SA approved service providers who collect and recycle empty plastic pesticide containers.

Emergency situations

Should a farm worker accidentally be exposed to or ingest any pesticide, immediately call the emergency helpline on 082 446 8946 for advice and support. Do not give the person milk, water or anything else to drink, unless strictly advised so by the poison information centre. Whatever the level of exposure, it does not change the fact that such a person needs professional medical attention. The poison information centre will only advise how to stabilise the person and what the first steps after that should be. Healthy farm workers are a great asset to a farm; they should be adequately trained, properly informed and appropriately clad in protective clothing.

Preserving Bt technology through stewardship

The dictionary definition of stewardship means to 'to take care of something'. Within the plant biotechnology context, stewardship is defined as the responsible introduction and use of biotech-derived products across the entire plant product life cycle – from idea, through development and launch, to discontinuation.

Chantel Arendse
SA Grain
December

Stewardship extends beyond regulatory compliance. It requires a coordinated effort from stakeholders along the product value chain to preserve the efficacy of the introduced biotech trait and to ensure that the benefits to sustainable agriculture are realised.

Cultivation of insect resistant (IR) maize

Over the past 20 years, South African maize growers have rapidly embraced biotech crops with a built-in insecticidal protein that provides protection against targeted maize pests such as maize stalk borer (*Busseolla fusca*). Biotech maize varieties, expressing a range of different insecticidal proteins from the naturally occurring soil bacterium, *Bacillus thuringiensis* (Bt), have been commercially approved by South African regulators as single or stacked Bt traits.



By 2018, an estimated total of 2 million ha of biotech maize was grown in South Africa. These comprised of 207 000 ha of insect-resistant (IR) maize, 460 000 ha of herbicide-tolerant (HT) maize and 1,3 million ha of stacked IR/HT maize (ISAAA, 2019). Despite the successful adoption of biotech maize by growers, continued accrual of benefits is largely dependent on proper stewardship of available Bt crops to sustain its effectiveness as a pest management tool. With Bt insect resistance having already been documented in South Africa, the deployment of insect resistance management (IRM) strategies is a crucial component of an integrated pest management (IPM) system under the stewardship life cycle approach.

IRM – old problem, new technology

The purpose of IRM is to maintain the effectiveness of Bt crops as an insect pest management tool by preventing or delaying the development of insect resistance to inherent Bt traits. It is important to note that resistance is not a unique concern for biotech-derived crops and remains an ongoing challenge for other types of pest management applications.

Implementation of resistance management is generally mandated wherever Bt crops have been commercialised, including South Africa. In terms of the Genetically Modified Organisms Act (No. 15 of 1997), technology permit holders are required to do the following:

- Monitor resistance management strategies.
- Develop a surveillance plan for detecting resistance development.
- Undertake grower educational programmes.
- Develop a compliance management plan to counteract resistance development.

A key component of a resistance management programme is the adoption of a refuge strategy, where the concept of a 'refuge' is defined as a non-Bt planting area that supports the production of Bt-susceptible insects.

Refuge strategy – how it works

Growers using Bt maize are required to plant a refuge area of non-Bt maize. The refuge maintains a population of susceptible insect pests not exposed to selection pressure from the Bt protein. These susceptible insects would be available in high enough numbers to breed with resistant insects that emerge in the Bt crop field, ensuring that susceptibility is passed on to offspring, helping to prevent the emergence of resistant populations over time.

One of the refugia management options available to maize growers locally, is to plant a refuge adjacent to their Bt-cultivated maize fields. It can either be a minimum of 5% non-Bt maize refuge that is not treated with an insecticide or a 20% non-Bt maize refuge that may be treated with a registered non-Bt-containing insecticide/biopesticide within 400 m of the Bt maize field.

The diversity of producers and farming practices in South Africa does not allow for a one-size-fits-all approach. It is crucial that growers in the different regions, planting different maize varieties with different combinations of biotech traits, work closely with technology developers, seed suppliers and distributors, grower advisers and extension services to receive the necessary technical support and ensure refugia management compliance that is compatible with local agricultural practices.

Good IPM is good resistance management

Resistance management by way of refugia represents just one of the various tools to reduce selection pressure for resistance. A robust resistance management plan needs to match the best available insect resistant technology to combat the targeted pest with due consideration to the local environment and agricultural practices in an integrated manner. Apart from the refuge strategy, other important considerations in IPM and resistance management strategies for Bt crops include the following:

- Knowledge of major pest biology and ecology.
- Understanding the efficacy of available insecticidal traits.
- Selection of locally adapted crop varieties.
- Understanding local cropping systems.
- Scouting and monitoring for target pest damage.
- Application of alternative pest management options when needed.
- Grower education and training on responsible use.

Maximise benefits, minimise risk

The value of insect management technologies such as the use of Bt crops within the agricultural landscape cannot be disputed. However, Bt crop technology on its own is not an all-encompassing pest management solution as its effectiveness and sustained use are dependent

on a diverse range of integrated pest management practices, including IRM. Efforts directed at education, knowledge transfer and training are critical to ensure that there is stewardship compliance for biotech crops.

Most important to remember is that biotech stewardship is a shared responsibility, requiring a coordinated effort from stakeholders along the product value chain to maximise sustainable production of Bt crops, while minimising losses and protecting biodiversity and the environment.

CropLife SA is committed to stewardship initiatives that ensure safe, effective and responsible use of plant biotech products within a holistic IPM strategy as part of the product stewardship life cycle approach.

Wurmplae wat kan pla

Gerhard Verdoorn
SA Graan
Desember

Water is 'n lewegewende element waarsonder geen organisme op aarde kan bestaan nie. Wanneer water egter aan sekere temperature gekoppel word, kan dit tot landbouplae lei. Dis alombekend dat weerpatrone plantpeste se voorkoms en insidensie beïnvloed.

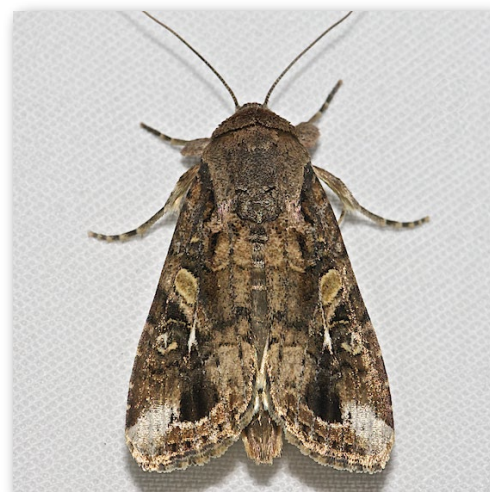
Goeie neerslae, hoë humiditeit en warm weer is bevorderlik vir plaaguitbrekings. Produsente moet dus die langtermynweer fyn dophou om voorbereid te wees op die aankoms en uitbreek van plantplae. Die trope van Afrika is teen einde September gekenmerk deur besonder hoë humiditeit en neerslae. Al wat Suid-Afrika benodig om daardie vogtige tropiese lug hierheen te lok, is warm binnelandse toestande met laedrukstelsels. Dit sal nie net help om reën te bring nie, maar sal ook die ontwikkeling van plaagkomplekse aanwakker en selfs nuwe vlae van 'n plaag soos die bekende herfskommandowurm kataliseer.

Suid-Afrika het onlangs 'n ernstige vier jaar lange droogte beleef. Toe die reëns uiteindelik aan die einde van 2019 opdaag, het die motte en wurms 'n skrikbewind begin voer. Die lang droogte gevolg deur goeie reën en warm weer het die wurmplae laat ontplof. Dit was ook nie verbasend dat die eerste sprinkaanuitbreking in meer as tien jaar vroeg in 2020 ervaar is nie. Grondvog was genoegsaam en die grond- en lugtemperatuur was so te sê reg – toe broei die sprinkane uit! Dit raak deesdae al hoe makliker om korttermyn- en langtermynweerpatrone te monitor – dit is die produsent se eerste wapen teen plantpeste.

Monitering van wurmplae

Voorkoming is beslis goedkoper en meer suksesvol as beheeraksies. Die enigste manier om te voorkom dat plantplae gewasse invaar en grootskaalse skade veroorsaak, is om te weet waar en wanneer daardie plae gaan opdaag. Verkenning is ewe belangrik vir kontantgewas- en boordprodusente. Daardie tyd van die dag wanneer almal reeds in die huis is en vir aandete begin voorberei, is wanneer die motte aktief raak en rondvlieg.

Of dit nou jong mielies of kanola is wat op die land staan, die produsent móét teen sonder verkenning doen. Kyk oor die landerye heen en soek na beweging.



Wurmplae soos die herfskommandowurm se motte beweeg in “wolke” en vaar dan die landerye in waar hulle paar en eiers lê wat die gewasse later van tyd beskadig. Moet ook nie vergeet dat motte na die plaasopstal se helder ligte aangetrek word nie. 'n Groot aantal motte op die voorstoep of onder die sekerheidslig by die stoor is gewis 'n rede tot kommer. Die verskillende motspesies is egter moeilik om te onderskei.

Die produsent moet dus fyn oplet na die bepaalde kenmerke wat die spesies sal identifiseer. Goeie hoëresolusiefoto's kan via WhatsApp na 082 446 8946 (CropLife SA se Goggagroep) gestuur word, waar die kenners ten minste kan aandui of dit herfskommandowurm, Afrika-bolwurm, patatadder, bolwurm of 'n verwante spesie is.

Verder moet produsente van feromoonlokvalle gebruik maak wat redelik spesie-spesifiek is. As daar meer as 'n sekere aantal mannetjiemotte per nag gevang word, moet die produsent voorberei op beheeraksies.

Visuele verkenning in gewasse is noodsaaklik. Dit is moeilik vir CropLife SA om raad te gee oor plaaginvalle as die wurms "al so groot soos luislange is". Sulke wurms was al vir etlike weke in die gewas teenwoordig en die skade wat hulle veroorsaak, is enorm.

'n Produsent behoort elke tweede dag in die landerye te soek na eierpakkies op blare en motte wat in ongewone getalle waargeneem word. Dit is alreeds rede tot kommer. Eierpakkies kom nie altyd bo-op gewasse se blare voor nie en verg dus moeite om op te spoor.

Die herfskommandowurm se eierpakkies sit bo-op die mielieblare en lyk soos wit miniatuurvuurhoutjies wat styf saamgebondel is. Slegs 'n paar dae verloop voordat die wurmpies uitbroei en die produsent gereed moet wees om beheeraksies toe te pas.

Daar is gelukkig reeds verskeie van die GM-mieliekultivars wat benewens die stronkboorder ook die herfskommandowurm self beheer. Mielies wat nie die Bt-geen bevat nie, is egter steeds uiters kwesbaar vir dié plaagspesies en monitering is noodsaaklik.

Vroeë beheer is beter as krisisbestuur

Inseklarwes, soos wurms in hul eerste en tweede instars (groeifases), is hoogs sensitief vir die meeste plaagdoders, terwyl die latere groeifases hardnekkig teen plaagdoders baklei.

Dit is welbekend dat die herfskommandowurm teen piretroïede en sommige organofosfate weerstandig is en dat selfs swaar dosisse van sulke middels nie die volwasse wurms beheer nie.

Middels soos indoksakarb en emamektienbensoaat is wel suksesvol, maar dit moet aangewend word voordat die larwes die koppe invaar omdat die skutblare penetrasie van plaagdoders totaal onmoontlik maak.

CropLife SA word jaar na jaar gebombardeer met navrae van produsente oor groot-skaalse infestasies van wurmplae in kanola en mielies wanneer die wurms al heeltemal volgroeid is.



Teen daardie tyd is dit feitlik onmoontlik om die gewas te red, selfs al word die "hardste" chemie gebruik. Vroeë plaagbeheeraksies beteken dat produsente "sagter" middels soos biologiese produkte kan gebruik.

Biologiese middels, soos die verskillende *Bacillus thuringiensis*-bakterieë, het nie 'n onmiddellike uitklopaksie soos chemiese middels nie.

Hulle veroorsaak egter dat die klein wurmpies ophou om aktief te vreet en verminder so die moontlike skade.

Vir latere instars moet produsente middels soos indoksakarb oorweeg, wat 'n besonder vinnige terminering van eetlus by die wurms veroorsaak.

Vroeë beheer is dus definitief die antwoord. Onthou dat geen middel op 'n gewas of plaag aangewend mag word as dit nie daarvoor geregistreer is nie. Al die inligting oor plaagdoders is beskikbaar op www.agri-intel.com. Die webtuiste is maklik om te gebruik, met ten minste 20 soekfunksies wat die produsent kan lei na die korrekte plaagdoder om aan te wend.

Rol van meganiese en geenbewerking in plaagbiologie

Die landbousektor het reeds jare gelede besef dat jaar-op-jaar-bewerking niks goeds vir die grond inhou nie. Daar word stadig maar seker oorgeskakel na minimum of geenbewerking ter wille van die grond. Ongelukkig is dit so dat geenbewerking sekere insekplae kans gee om maklik te oorwinter en so die volgende jaar die gewas weer met mening aan te val. Die ploegaksie het plaë, siektes en onkruid help onderdruk, maar daardie meganiese beheeraksie vind nie meer plaas nie. Selfs die nagmuise trek voordeel uit geenbewerking en dit vererger jaar op jaar! Produsente behoort so dan en wan die grond te ploeg om die plaë, siektes en onkruid net weer 'n slag te wys wie is baas.

Onkruidbeheer rondom gewasse

Dit is haas ondenkbaar dat 'n produsent onkruid buite om gewasse moet beheer. Dis egter noodsaaklik wanneer dit by spesies soos die herfskommandowurm kom, omdat heelwat onkruidspesies as gasheer vir dié plaag optree. As onkruid welig om die gewaslanderye staan, het die herfskommandowurm 'n veilige hawe om sy bevolking te vestig, aan te teel en dan die gewas op die regte tyd in te val en skade aan te rig. Meganiese sny met 'n trekker en snyer is goed genoeg om die onkruidvolume te verminder sodat die motte nie daar eiers kan lê nie.

Teikengewasse vir die herfskommandowurm

Alhoewel mielies altyd die grootste kommer is wanneer die herfskommandowurm kop uitsteek, is dit nie die enigste gewas wat skade kan opdoen nie.

Die onlangse verlede het bewys dat sonneblomme, sojabone, droë bone, suikermielies en verskeie groentesoorte ook deur die herfskommandowurm geteiken word.

Alle produsente, veral diegene wat gemengde boerderye het, moet op die uitkyk wees na dié pes in die volgende vyf maande.

Critical pest alert: Migratory locusts

All farmers need to be on high alert for the emergence of the brown locust (migratory locust)

Excerpts in Harvest SA.
Grain SA Perspective
Landbou.com, OFM

in the Northern Cape Karoo and Kalahari, the southern and western Free State, the Eastern Cape Karoo and savannah areas and the Kalahari areas of the Northwest Province. Small to medium flying swarms of brown locusts are aggregating in the central Karoo and have spilled over to the adjoining areas of the Free State.

Whilst the Department of Agriculture is expending all efforts to control the hopper bands, it is likely that the magnitude of the brown locust outbreak will increase, especially if it rains over the central and northern Karoo, Bushmanland, Namaqualand and the southern Kalahari.

Any person who sees hopper bands or flying locust swarms must report such observations immediately to the Department of Agriculture's locust office in De Aar on 053 631 3122 or 053 631 3261. Travellers often report seeing "red ants" crossing tar roads in the Karoo; those are locusts that have just hatched and are a dull reddish colour. They grow rapidly and by their fourth instar develop wings. In their fifth instar they fly and aggregate to form large swarms. The Department of Agriculture's objective is to focus on hopper bands because only small amounts of pyrethroid insecticides are used to control them with

very limited, if any, damage to the sensitive ecology where locusts normally breed.

Only the Department of Agriculture may acquire the insecticides that are registered to control the brown locust. The department is mandated by the Agricultural Pests Act, No. 36 of 1983 to manage brown locust outbreaks. It is therefore important that farmers report outbreaks to the department. Farmers can manually control the hatchlings and hopper bands by running flocks of sheep over them or by pulling a large tyre over them behind a vehicle.

There are many other grasshopper species that are hatching now. Farmers and members of the public are encouraged to take pictures of such grasshoppers and send it to the CropLife SA emergency number 082 446 8946 for species identification and advice. Most grasshopper species other than the brown locust do virtually no real crop or veld damage, hence control is not required.

The national focus should be on the brown locust to prevent the outbreak developing into a disaster like in Ethiopia, Kenya, Somalia and Sudan with the desert locust. South African crop farmers can ill afford an invasion of the brown locusts into cash crops and it is therefore important for all citizens to play a role in keeping a close watch on this species over the next four months.

Maximum residue limits (MRLs) unpacked

Maximum residue limits (MRLs) are the limits on the maximum amount of a particular pesticide which is permitted in food.

Dr. Brendon Neumann
Business Innovations
Manager ~ Madumbi

The lowering of MRLs in certain markets has been largely driven by three factors.

- Today's consumers are demanding change. This pressure is being placed on both supermarket chains and governments, demanding that food be produced with the use of less chemistry.
- Inter-competition between supermarkets and independent produce markets, where lower MRLs are used as a unique selling point to gain a greater share of the market.
- Governments can also set lower MRLs as potential trade barriers in order to protect their own producers and limit cheaper imports.

Another aspect relating to residues is the total number of residues permitted on certain crops. Previously, as long as the residue levels for each product used in a pest or disease management programme were below the maximum levels set, the number of products used did not really matter. Nowadays, a number of markets also set a limit on the number of detectable residues permitted. This means that one may be limited to only 3 or 4 residues regardless of how low the levels of the residues are.

These constraints are placing increasing pressure on growers. While it is largely several European countries and supermarkets which are driving these changes, some of this does filter down to local South African markets and local producers wanting to export and needing to conform to the MRL restrictions set by the market they are exporting to. Growers can generally get significantly higher prices when exporting to these markets so there is a strong incentive to meet these lower MRL targets.

Generally speaking, our warmer climate results in greater pest pressure making it difficult for our growers to meet European standards in terms of residues while still controlling all the pests and diseases and producing good quality produce. A grower may have several major pests and diseases which need to be controlled in a season. Each may require its own unique solution but the market demands only 4 residues at the end of the season.



This is where biological solutions can play a significant role. One of the main advantages of biological pest management solutions is that they do not leave chemical residues and are therefore not constrained by MRLs or withholding periods. Generally speaking, they can be used right up until harvest and can offer control both before, during and even post-harvest.

This does not mean that all growers need to start farming organically with the total exclusion of chemistry. Rather, growers should look to well researched and planned IPM programmes which aim to use the best chemical solutions available in the correct application windows so as to limit the number and level of residues.

These chemical solutions should be integrated with good quality biological solutions and best agronomic practices (e.g. sanitation, monitoring etc.) to achieve the best quality production. Where this is done correctly, growers can realistically look to achieve the production of healthy, nutrient dense, residue free food. For the majority of growers, programmes are traditionally planned in terms of using as many traditional chemical products as possible so that they are just below the MRLs for each product and basically on the maximum number of residues permitted. This then means that if anything doesn't go 100% to plan, they are relying on a biological product to perform a firefighting job towards the end of the season where they have no more chemical options available to them.

It is argued that a well-planned IPM programme should look to use each available solution in the position in the programme where it can add greatest value. The aim should be to come out with lower than permitted MRLs or number of residues so that if problems arise later in the season one still has strong firefighting solutions in the bank available to use without the risk of limiting your market access due to excessive residues. Programmes should be planned with the inclusion of biological solutions from day one so as to avoid spraying oneself into a corner.

We're here to help

If you require assistance, would like to become a member, or if you have general feedback, we would love to hear from you. Please contact any member of our team:

CropLife SA	Office	+27 (0)87 980 5163	info@croplife.co.za
Rodney Bell	Chief Executive Officer	+27 (0)66 273 6027	rod@croplife.co.za
Gerhard Verdoorn	Operations and Stewardship Manager	+27 (0)82 446 8946	gerhard@croplife.co.za
Fikile Nzuza	Regulatory and Government Liaison	+27 (0)71 383 2391	fikile@croplife.co.za
Elriza Theron	Marketing and Communications Manager	+27 (0)72 443 3067	elriza@croplife.co.za
Nadia van Niekerk	Financial Administrator	+27 (0)72 940 5591	nadia@croplife.co.za
Chana-Lee White	Agri-Intel Manager	+27 (0)72 298 9389	chana@croplife.co.za
Luigia Steyn	Agri-Intel MRL Consultant	+27 (0)60 508 6369	luigia@croplife.co.za
Chantel Arendse	Lead: Plant Biotechnology	+27 (0)82 992 0952	chantel@croplife.co.za

The CropLife SA team wishes you and your loved ones a peaceful festive season and a prosperous new year. Thank you for your support during 2020 and we look forward to an even better 2021.