CROP CIRCULAR

ISSUE 3
2019

IN THIS ISSUE

- A Look at Integrated Pest Management
- Who are you Buying your Agrochemicals from?
- What is your Responsibility?

CONTRIBUTE

We are always looking for news, photographs or event updates from our members. Please forward your contributions to elriza@croplife.co.za

WELCOME

Rod Bell
Chief Executive Officer
CropLife South Africa

A sincere welcome to all readers of the CropLife SA Crop Circular. September 1st 2019 was the anniversary of the new CropLife SA employees joining the association; along with the legacy employees, I am extremely proud of what the small team has achieved in the past 12 months, albeit with many more additions and improvements envisaged going forward.

The national economy, interesting politics and tough climatic conditions continue to dominate many discussions we have with our members. Whilst hopeful for a great winter rainfall season a few months back, recent dry conditions in the winter rainfall area have now started to impact grain yield forecasts. We all look forward to a summer rainfall season of rainfall at or above the long-term average.

Since the last issue, the CropLife SA team has been interacting with many member companies in an effort to better understand the needs and expectations of the CropLife SA 'customer'. These sessions are proving to be invaluable so again, please feel free to invite us to your events or facilities to give us a better understanding of how we can work closer together.

One of the common comments received is on the subject of including more Afrikaans articles in our Crop Circular. Starting with this issue, we will be including more Afrikaans articles and will make English versions available on request for our non-South African or non-Afrikaans speaking subscribers. In addition to articles covering the key focus areas of the mandate CropLife SA staff have from ExCo (namely Stewardship; Government liaison, legislation and compliance; Communication and brand building of the crop protection industry; and Education, training and skills development) you will notice we are publishing submissions from member companies. As mentioned in my message in issue number 2 of the Crop Circular, CropLife SA is your association and we welcome submissions that are of interest to the greater industry from as many members as possible.

The 2019/20 cycle of the Continuous Professional Development (CPD) programme for member company sales agents is well underway. The latest rules of the programme have been approved by the Distribution Forum and ExCo and have been circulated to all nominated Skills Development Facilitators in each member company. I would also like to congratulate sales agents who have already achieved Crop Advisor status for current cycle during the analysis of data after the first three months of the current cycle - some sales agents from Loskop Kunsmis, Laeveld Agrochem and Nulandis have already achieved Crop Advisor accreditation. In order to continually assist the nominated SDFs from our member companies, a focus session for SDFs in the Western Cape was held in September and a follow-up session for SDFs who are based in Gauteng, or who can travel to Gauteng, will be held in October.

Unfortunately, the regulatory environment in our country continues to be challenging. The office of the Registrar of Act 36 of 1947 continues to be understaffed and there seems to be no workable solution to clearing the backlog from government. CropLife SA continues to engage with the Registrar but is also working on various proposals that could result in actions to reduce the backlog in registration approvals. Both President Ramaphosa and our Finance Minister have repeatedly pointed out that agriculture, especially the export of fresh and processed agricultural produce, must be part of the turn-around of the South African economy. However, our local producers continue to lose competitiveness on the international market due to the fact that there is such a delay in our industry bringing new technologies to the market, especially when the export destinations for our agricultural produce continue to demand the use of new technologies whilst removing approval for the use of older crop protection solutions. CropLife SA will be using this situation on future efforts with all stakeholders to improve the regulatory environment in the country.

I look forward to your continued feedback, whether it be constructive criticism or compliments. This is your association and the CropLife SA team is here to assist your business activities.

CONTENT

3 What's New in CropLife SA?

4 Acknowledgements

5 Events: Training CropLife SA at Member Events

7 Pesticide Use in the Wine Industry Placed in Context

10 Ensuring Ethical Pesticide Use in SA's Forestry Sector

12 The Blue Crane National Bird of South Africa

13 Strategiese Plaag-bestuur en die Bedryf se Uitdagings

15 Geïntegreerde Plaagbestuur

19 Recycling of Pesticide Containers
Voorkoming in Plaagbeheer is Beter as Genesing

21 Who are you Buying your Agrochemicals from?

23 Die Heuningmakers se Toekoms is op die Spel

25 One's Trash is Another's Thriving Business

27 Riglyne vir die Oprigting en Bestuur van Plaagdoderstore op Plase

30 Klop Plaagdoder-weerstand met Slim Planne

34 A Look at Integrated Pest Management

36 What is your Responsibility?

39 New President and CEO at CropLife International

40 Feedback: MRLs, Consumer Safety and Trade in Africa Workshop

42 Feedback: CropLife Africa Middle East Container Management Workshop in RSA

43 Contact Details

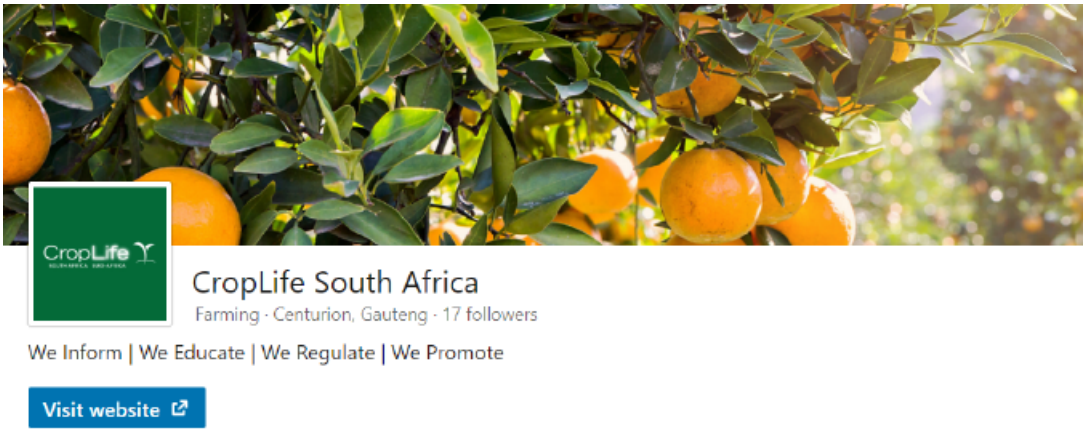
New Members at CropLife SA

A warm welcome to our new members, Acorn Products and Bancella South Africa as supplier members and Farmisco (trading as Kynoch) and Wesgrow Potatoes as associate members.

We hope the journey with CropLife SA will be a mutually beneficial and valuable one.

Linkup with LinkedIn

In addition to our Facebook, Twitter and Instagram pages, we have launched a LinkedIn page where we will share various articles and topics of interest. To follow us, search for CropLife South Africa on LinkedIn.



New Additions to the CropLife SA Family

Two new members have joined the CropLife SA family over the last couple of months.

Please join us in welcoming baby Sofia who arrived on 13 March and baby Enzo who joined 12 July.

Sofia is Luigia Steyn, CropLife SA MRL Consultant's daughter and Enzo is Fikile Nzuza, CropLife SA Regulatory and Government Liaison's son. Congratulations to you both.

Kobus Hartman

On 10 September, Exsa hosted their annual grower feedback day about the production and marketing issues relevant to the past harvest season as well as highlighting the opportunities and challenges for the forthcoming season.

One of the speakers was Kobus Hartman from Viking Marketing who spoke to attendees about Agri-Intel and how it can benefit the farmer. We would like to thank Kobus for his unwavering commitment to, and continuous promotion of, the platform.

From left to right: Danie Kritzinger of Agrimotion, Willie Kotze of Dutoit Agri, Kobus Hartman of Viking and Alwyn van Jaarsveld of Tessara Fresh Science.

Photo taken from EXSA South Africa's Facebook page.

VIKING Use of Premises

CropLife SA provided CPD-system training to the various Skills Development Facilitators located in the Cape region on 17 and 18 September. A sincere thank you to Viking Marketing for allowing us to make use of their premises for this purpose.

The next training session will be held in Gauteng on 21 October at the CropLife SA office in Centurion. Please contact Nadia van Niekerk (nadia@croplife.co.za) for more information.

Condolences

It is with great sadness that we learned of the passing of Dr Ockie Fourie on Monday 12 August 2019. The funeral service was held at the Reformed Church, Wapadrand on Thursday, 15 August.

Dr Fourie was a renowned toxicologist and his expertise and contribution to the industry will be missed by many. Our condolences go out to his family and friends during this trying time.

Training

CropLife SA operations and stewardship manager, Dr Gerhard Verdoorn has been quite busy over the last couple of months offering training to our members on various subjects ranging from Responsible Use to Stewardship.

"Dr Verdoorn het ons besoek by ons jaarlikse konferensie waar hy vir ons 'n lesing aangebied het oor die Rentmeesterskap-program. Die lesing was baie goed ontvang deur al die Protekkers, ons sien uit om hom in die nabye toekoms weer te gebruik om ons personeel verder op te skerp. Baie dankie aan CropLife vir die geleentheid. Dit word opreg waardeer en is vir ons van uiterste belang om die nuttige inligting wat ontvang word te versprei." ~ Lientjie Nel (Protek)

Thank you to those members who made use of these services such as Die Koöperasie, Protek, Starke Ayres, Avima, Wenkem, Nulandis and InteliGro. We encourage our other members to get in touch with us to see how we can assist you.

Please note that as from the next Distributor Forum and Exco meetings on 19 November 2019, the starting times will change to 09h30 and 12h00 respectively.

This change is to accommodate those members who need to make travel arrangements.

CropLife SA at Member Events

A big thank you to every member who has invited CropLife SA to attend your company events and special occasions, whether to do a presentation or as a guest. We sincerely appreciate the opportunity to get to know your company, your corporate culture and your team and we believe it goes a long way to strengthen our sector's ties.

And to those who hosted CropLife SA team members at your offices to teach them about your operations, introduce them to your team or take them on a tour of your facilities, thank you for taking the time out of your busy schedules to accommodate us.

Pesticide Use in the Wine Industry Placed in Context

Issued by CropLife SA - 4 September 2019

CropLife South Africa is the industry body that represents responsible manufacturers, suppliers and distributors of sustainable crop protection and public health solutions in the agricultural, public health, non-crop and consumer sectors of South Africa.

The recent media coverage based on a report released by Oxfam Germany and Women on Farms Project (WFP) has prompted CropLife SA to respond with sound information so as to place these findings into the correct context.

Wine, like all other foods and beverages, is produced in a highly competitive environment, not just for market share, but also against plant pests, plant diseases and weeds that not only threaten agricultural crops, but may also inoculate agricultural crops with very dangerous pathogens that may prove highly toxic to consumers. Responsible crop protection, therefore, plays a pivotal role in ensuring a crop reaches its potential with little or no risk to its consumers.

There are three areas that need to be elaborated on if one is to understand the crop protection landscape in South Africa, specifically in reference to the WFP/Oxfam Germany report. The first is the South African regulatory environment, the second is the matter relating to pesticides that are banned in the EU but not in South Africa, and the third is the subject of Maximum Residue Limits (MRLs) and what it means for South African producers who export their products.

The South African regulatory environment

The Fertilisers, Farm Feeds, Agrochemicals and Stock Remedies Act (Act Nr. 36 of 1947) requires that all agrochemicals be registered and packaged in approved containers that display an approved label. The product's composition and physical properties must also satisfy the requirements that were submitted upon application for registration and the product's efficacy must match that of the registration application.

When a company develops an agrochemical, there's a broad spectrum of required research that is needed for the composition of the product registration, including a full toxicological report that will identify any risks as well as specify the maximum allowable human consumption.

Once the product is registered, the Act continues to regulate all other aspects pertaining to agrochemicals, including the sale of the product, transportation, storage, application and disposal of empty containers and obsolete stocks. When it comes to application, a producer must ensure that all workers handling, mixing and applying pesticides wear appropriate protective clothing as instructed by label warnings, precautions and pictograms.

There are two points worth noting at this stage. Firstly, as long as a product complies with all the necessary standards and has obtained a registration (L) number, it is a legal product in South Africa.

Whether or not the product is banned in the EU is irrelevant as there are many factors differentiating the various regions. If produce is exported, the Maximum Residue Limit (MRL) for pesticides used during the field production cycle of the produce, must be below the export destination's set limits, which is discussed in more detail further in this document.

Secondly, the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) requires that all workers handling, mixing and applying pesticides wear appropriate protective clothing. Any person who does not comply with this, transgresses this Act. In other words, the producer must ensure access to the protective clothing and the farm worker must wear it.

The responsibility lies with both parties. A fact that is not promoted often enough though, is that the manufacturers of the agrochemical products often supply complimentary PPE kits to the farm workers. In one year alone, a single CropLife SA member already distributed 4 000 of these kits, and CropLife SA has over 40 supplier members. In addition, both supplier and distributor members of CropLife SA repeatedly provide technical and safety training on the farm, free of charge.

South African fruit growers are acutely aware of these regulations and must comply with them if they are to meet production standards set by, for instance, GLOBAL.G.AP. In addition, they provide training on responsible pesticide use by skilled people and are audited annually to authenticate adherence to this.

Use of pesticides banned in the EU

One cannot compare the production areas in South Africa with those of the EU. Certain products have no other suitable alternatives. Certain pesticides such as paraquat dichloride may be highly toxic, but with appropriate safety measures pose very little risk to human health. Paraquat is a desiccant that is used to prepare firebreaks. It only dries out the vegetative plant parts above the soil which is then burned down to make firebreaks. Due to the entire plant not dying off, gully erosion during rain is avoided.

When considering glyphosate, a basic glycine amino acid molecule, most people will be surprised to find out that table salt is ranked as more carcinogenic than glyphosate. The International Agency for Cancer Research (IARC) declared glyphosate as a probable carcinogen under category 2A due to a study that found that mice had developed cancer when exposed to very high levels of glyphosate, however, it is important for the public to take note of the research protocol that was followed in that study.

The researchers chose mice that were genetically prone to cancer and were dosed with more than 1 403 milligrams per kilogram body mass glyphosate. In other words, they were subjected to glyphosate levels that were completely irrational. While on the subject of irrational doses, even if you consumed 140 glasses of wine per day, every day, for 70 years, you would still be under the level of glyphosate considered "no significant risk".[i]

Two other teams of researchers used ordinary mice and couldn't bring about cancer, not even with doses higher than the first study. The results are consistent with other research around the world, one of which involved more than 5 000 farm workers, where cancer could not be linked to glyphosate.

In this context, one should note that the European Food Safety Authority (EFSA) stated in 2015 that they have done a comprehensive review on all research concerning glyphosate and cancer and found that it is unlikely that glyphosate poses a cancer risk to people.

Amongst various others, the German Federal Institute for Risk Assessment (BfR) for the European Commission on the Annex 1 renewal of glyphosate evaluated the complete genotoxicity, carcinogenicity, and human epidemiology databases and also concluded that glyphosate is unlikely to pose a carcinogenic risk to humans[ii].

The decision to cancel certain pesticide registrations in the EU may be due to a number of factors such as inefficacy in certain climatic conditions or resistance build-up and does not necessarily have anything to do with toxicity or risk to users. South Africa assesses these products separately, based on local production environments. Merely banning these products because they are banned in the EU, without reasonable cause in the local environment or any suitable alternatives, will inevitably have disastrous results for South African agriculture, including job losses. If the exported product complies with the set MRLs of the export destination, there is no transgression of any regulations.

Maximum Residue Limits

Pest control is a given in modern agriculture with crop protection products being integrated into agronomic practices, cultivar selection, mechanical pest management and biological pest management. It is thus expected that food commodities may have traces of pesticide residues, albeit it at very low concentrations. Analysis conducted by third parties (other than growers or regulators) may very well detect pesticide residues, but to call alarm over such pesticide residues is not pragmatic nor scientific. For each pesticide active ingredient, including natural pesticides and pesticides labelled for use in organic agriculture, there is an allowed daily intake (ADI) for consumers that is determined by international regulatory agencies.

The ADI is a tangible quantity of an active ingredient measured against human body mass which may be consumed by a person each day of such a person's life, without any reasonable expectation of clinical harm caused to the person. It is prudent for any third-party making statements about pesticide residues to do the calculations of residues in a commodity like wine, as they will most likely find that the residues are within the limits if a person consumes a normal quantity of the commodity per day.

South African law (Act 36 of 1947) dictates that an agricultural remedy may only be applied during the label instructed window of application to ensure that the MRL, which complies with WHO standards, is not exceeded if the commodity is harvested after the pre-harvest interval (PHI). Should there be a zero level MRL for a particular active ingredient in export destinations, such an active ingredient may not be applied at all during the field production phase of the commodity.

As an industry we have the responsibility to ensure sustainable, safe and affordable food production, and therefore food security, in South Africa, and the regulatory environment supports this. It is also of paramount importance that we collectively ensure responsible communication of complex matters affecting various role players and place them in the appropriate context.

[i] Carl Winter, Ph.D., Professor of Food Toxicology, University of California at Davis. Based on the level set by the State of California, using the glyphosate amount measure 51.4 parts per billion

[ii] Markard C. 2014. Ergebnisse der Vorstudie HBM von Glyphosat. Dessau-Roßlau (Germany): Federal Environmental Agency (UBA), Umweltprobenbank des Bundes [Unpublished Report provided to] Berlin (Germany): German Federal Institute for Risk Assessment (BfR). [Google Scholar])

Ensuring Ethical Pesticide Use in SA's Forestry Sector

Lloyd Phillips
Farmer's Weekly
14 June 2019

With pesticide use under increasing scrutiny by governments and the private sector, stakeholders in the forestry sector should be mindful of how they use these agrochemicals. Roger Poole, chairperson of the Timber Industry Pesticide Working Group, spoke to Lloyd Phillips.

Please tell us about your working group

The Timber Industry Pesticide Working Group (TIPWG) was founded in 1999 in response to the first South African forestry companies receiving Forest Stewardship Council (FSC) certification. TIPWG was established to ensure industry collaboration, especially in terms of compliance with the FSC pesticide policy.

A combination of industry members, academics, regulators, pesticide experts, manufacturers and distributors, the group fits under the Forestry South Africa umbrella and promotes responsible use of pesticides in commercial plantations through technical support, industry collaboration, compliance and providing guidelines.

What are some of its key achievements?

The level of industry collaboration achieved through TIPWG is one of our crowning achievements. The forestry sector is both diverse and expansive; it's made up of 11 large-scale corporate companies, over 1 100 medium-scale timber farmers and more than 20 000 small-scale emerging growers. All have their own requirements and directions, but when it comes to all things pesticide-related, TIPWG brings them together.

TIPWG's website was launched in March last year and has revolutionised the way we communicate with forestry stakeholders. Using infographics, we break down complex aspects of pesticide use, explaining everything from regulations to standard operating procedures. The website is an ideal platform to host TIPWG's approved pesticide list, which contains only those pesticides registered for use in the sector in accordance with the Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act No. 36 of 1947, and which comply with the FSC pesticide policy. Exciting additions to the website are in the pipeline, and it's a platform that is evolving with the sector.

Is TIPWG involved in research?

Emphasising research is another key TIPWG achievement. South Africa's forestry sector is a relatively small client for most pesticide manufacturers and distributors; as a result, funding for pesticide research and development is limited and has to be sourced internally. In the wake of local FSC certification, and the requirements placed on the industry by the FSC pesticide policy, research into existing and alternative pesticides became a priority.

Through TIPWG, the sector has funded many research projects aimed at reducing chemical use. These were developed at Nelson Mandela University under the guidance of Prof Keith Little. This proactive approach has required a huge mindset shift, as well as the support and collaboration of the sector as a whole.

Does TIPWG work with the FSC?

A revision of the FSC pesticide policy has been published, and TIPWG was involved in every step of its review. We ensured that the South African forestry sector's voice was heard during the feedback sessions, and were heavily involved in the formation of both the environmental and social risk assessment and the international generic indicators (IGI). While we wait with bated breath to see how our feedback during the draft stages has been incorporated and what impact the final version will have on pesticide use within the sector, we feel a certain sense of achievement with the role TIPWG has played. The group is still in the process of unpacking and coming to grips with the details and knock-on effects of the policy. Interested can parties sign up for TIPWG's newsletter at tipwg.co.za to stay informed.

What difficulties has TIPWG experienced?

One of the major challenges in the early days was activating industry collaboration. Back then, the sector was more fragmented, with companies working in isolation rather than towards a common goal.

Communication was also a challenge, especially considering the geographical spread of forestry across South Africa, which made finalising decisions very difficult. Thankfully, the digital age has revolutionised this. The TIPWG website and newsletter, and the magazine that we have in the pipeline, will further aid our communication efforts.

The ever-growing list of FSC-restricted pesticides is another major challenge for the sector and one that looks likely to increase once the new FSC pesticide policy is published. For now, we're proactively ensuring the TIPWG's approved pesticide list is kept up to date. We are currently on version 31. In this way, we can make sure that our foresters remain compliant and are confident in their responsible pesticide choices.

Does TIPWG have any concerns about pesticide use in the forestry sector?

We do have few concerns. Forestry is one of the most restricted and tightly governed sectors, both under South African legislation and in terms of the compliance requirements placed on the sector by certification bodies such as the FSC, the International Organization for Standardization, the National Occupational Safety Association and the newly formed Programme for Endorsement of Forest Certification-accredited South African Forestry Assurance Scheme. With 80% of South African commercial timber plantations FSC-certified, pesticide use within the industry is minimal, targeted and highly scrutinised.

However, we have a concern about pesticide availability in the future. The FSC's prohibited list grows annually and this can be incredibly difficult for production and for ensuring our conservation commitments, such as removal of invasive species and creating firebreaks. What makes this even harder is the lack of suitable, well-researched products available. This is why a lot of TIPWG's focus is going into industry-funded pesticide research and towards communicating with various pesticide stakeholders, and bodies such as CropLife SA, to stay abreast of new products and developments.

If these concerns are not effectively addressed, what problems might this pose for the forestry sector?

It will find itself between the proverbial rock and hard place. We're under legal obligation, for example, to manage fires and also invasive species. In some instances, pesticides are the only sustainable tools available to do this from an integrated pest management (IPM) standpoint. Forestry participates in IPM through optimising silvicultural techniques, tree breeding activities, site-species matching and even the release of biological control agents, in order to reduce our reliance on pesticide. There are cases where chemical control methods are required to protect productive land and tree plantations, or to ensure that our environmental and social responsibilities are met. With an ever-limiting list of pesticides to turn to, we are going to find this increasingly difficult in the future.

What is in store for regulations relating to pesticide use in the forestry sector?
Regulations will only become stricter, not just through certification, as mentioned, but also through the Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act. This means TIPWG needs to be the mouthpiece for the industry, to stay abreast of changes and the impact they'll have, and to help the industry navigate these changes.

What advice does TIPWG have for stakeholders in the sector regarding the use of pesticides?
We're going through a time of significant change when it comes to pesticides, not just in terms of how we use them, but how society views them and the laws that govern them. There'll be changes to what we can and can't use, but what should always stay constant is that whatever methods we use, we use responsibly.

Always read the label; all information needed to ensure that the pesticide is applied correctly and safely will be there. Pesticides are as just one of the tools that can be found in an IPM toolbox.

The Blue Crane (Anthropoides paradisea) National Bird of South Africa

Henk van der Westhuizen
Managing Director
Philagro

I am currently reading a great book entitled "Yet more sweet days" by iconic fly-fishing author, Dr Tom Sutcliffe. Tom is one of the best-known fly-fishermen in South Africa, and indeed in the rest of the fly-fishing world. He was the originator of some excellent flies used in the pursuit of trout (and other species) such as the DDD (Duckworth Dargle Delight) and the Zak nymph (who said fly-fisherman are boring, these are just some of the delightful names given to flies used in the fly-fishing fraternity). Tom is, apart from an innovative fly-fisherman and author, a medical doctor, philosopher, artist and photographer – if he were a Springbok flyhalf, he would have been Superman.

His keen eye for detail and observation, and love of nature is reflected in his books, art and photography.

In this particular book, he describes a voyage between Cape Town where he resides and Barkley East, the latter being the venue where he went on a fly-fishing trip. Along the way, he wrote the following paragraph that got me thinking....

"The drive from Aliwal North to Barkley East has been pleasant, the dams along the way are full, the aloes decked in red blossoms, and the prickly pears sprouting flowers of pastel pink and pale yellow. In one field I counted more than a dozen Blue Cranes. That was pleasing, because not many years ago we saw few enough of them to be concerned. And since I've done this trip on average at least twice a year, I'm in a position to notice changes like this and it's good when they're changing for the better. Some years, certainly 2005 comes to mind, Blue Cranes were as rare as honest politicians. I wondered what had changed in their favour, but long may it live, whatever it is."

I contacted Tom and told him about the voluntary withdrawal of monocrotophos once the negative impact of monocrotophos on birdlife, and in particular the Blue Cranes, was evident. In fact, it was the concerns about the Blue Crane that kicked the industry into action, and led by CropLife SA, it was agreed with Act 36 of 1947 that all monocrotophos registrations should be cancelled and the sale of the product should no longer be tolerated.

One year later no more sales took place. Bear in mind that at the time, monocrotophos was widely used in maize and sorghum as an extremely cheap and effective product to control stalk borers.

But the industry stuck to its commitment, and I firmly believe that these events contributed to the increase in numbers of our national bird. Tom's reply was positive, and he thanked me for the information.

This goes to show that product stewardship is critical, a responsibility we should not neglect, and that we have an obligation to manage our products accordingly – it can, and does, make a difference.

The text quoted was done with the approval of Dr Tom Sutcliffe, author of "Yet more sweet days" and his image "Blue cranes " is also published with his permission.

Strategiese Plaagbestuur en die Bedryf se Uitdagings

Pieter Dreyer
Landboukundige en
Franchise Eienaar
Laeveld AgroChem

Is sitrus plaagbeheer, of dalk eerder plaagbestuur, 'n dissipline waar ons met korttermyn besluite of keuses maar net 'n relatiewe skoon en bemarkbare eindproduk op die winkelrakke probeer kry?

Of is dit 'n delikate proses van besluitneming, waar elke aksie 'n positiewe of negatiewe reaksie kan hê, waar ondeurdagte korttermyn besluite die langtermyn doel van volhoubare produksie van hoë kwaliteit produkte nadelig kan beïnvloed? Wat is die invloed van fitosanitêre plae op die samestelling van so 'n program en hoe gemaak met die maksimum residu limiete waaraan voldoen moet word?

Sitrus produksie – waarom so baie peste en plae?

Ver verwyderd van 'n natuurlike ekosisteem waar die groot verskeidenheid verskillende plantspesies en 'n nog groter verskeidenheid voordelige en nadelige insekte saamwerk om 'n delikate balans te weeg te bring, vind ons kommersiële sitrus produksie.

Sitrus word verbou in 'n monokultuur verbouingsisteem. Dit beteken dat die verskeidenheid plantspesies op 'n sekere geografiese gebied beperk is tot 'n enkele gewas met die uitsluiting van sommige onkruid spesies en dalk 'n dek gewas in die paaie tussen die rye.

Daar is dus 'n daadwerklike tekort aan verskeidenheid of biodiversiteit wat teweeg bring dat sekere plae en peste floreer as gevolg van die oorvloedige voedselbron.

Wanneer ons dan beheermaatreëls toepas om te verhoed dat hierdie plae en peste 'n negatiewe invloed op die vrugte se kwaliteit en kosmetiese voorkoms het, kan dit gebeur dat die voordelige insekte wat wel in die monokultuur ekosisteem voorkom, nadelig beïnvloed word. Dit kan dan lei tot 'n reperkussie effek waar die skadelike organismes in die afwesigheid van natuurlike vyande nog meer floreer.

'n Ondeurdagte plaagbeheer strategie kan dus maklik aanleiding gee tot meer bespuitings, hoër kostes en gewasskade.

Fitosanitêre plae

Suid-Afrika is een van die wêreld se grootste sitrusuitvoerders, dus word die grootste deel van ons kommersiële sitrus vir uitvoer na ander lande geproduseer. Dit kompliseer die saamstel van 'n aanvaarbare plaagbestuurprogram nog verder. Twee van die grootste uitdagings van uitvoersitrus is fitosanitêre peste en maksimum residu vereistes.

Fitosanitêre plae is plae wat nie voorkom in die lande waarheen ons uitvoer nie. Daar is dus streng maatreëls in plek om die verspreiding van die plae na ander wêrelddele toe te voorkom. Die lae toleransie vir die voorkoms van hierdie peste lei dan noodwendig tot hoër beheer kostes en moontlike markbeperkinge. In 'n goeie plaagbestuurprogram moet daar dus noukeurig op die voorkoms van hierdie spesifieke plae gelet word. Dit moet akkuraat gemoniteer, gedokumenteer en beheer word. 'n Goeie moniteringsisteem is dus 'n vereiste vir elke sitrus produsent vir mark toeganklikheid en ingeligte besluitneming.

Chemiese residu bestuur

Die bestuur van chemiese residu vlakke in die vrugte is die ander aspek van sitrus produksie wat toenemend aandag geniet. Toenemend vereis die eindverbruiker en aankopers van vars produkte so min as moontlik chemiese residu op die vrugte.

Dit sluit die hoeveelheid aktiewe bestanddele in, asook die waarde van elke aktiewe bestanddeel. 'n Aktiewe bestanddeel is die deel van 'n chemiese produk wat die produk sy plaagdodende eienskappe gee.

Wanneer vrugte chemies behandel word, word daar 'n chemiese residu, gewoonlik slegs in die vrugskil, agtergelaat. Vir elke aktiewe bestanddeel het elke land 'n vooraf goedgekeurde maksimum residu limiet. Dit wil sê die hoeveelheid van 'n aktiewe bestanddeel wat op 'n vrug mag agter bly, ten tye van oes, wat nie skadelik vir mens of dier sal wees nie.

Die beperking van die hoeveelheid aktiewe bestanddele maak dit nog moeiliker om 'n kosmeties aanvaarbare vrug te produseer.

Die ontwikkeling van plaagbeheer produkte is onderhewig aan baie streng wetgewing met betrekking tot die effek daarvan op mense en die omgewing. Dus raak produkte meer spesie spesifiek, het laer dosisse nodig om die werk te doen en gewoonlik korter onthoudings periodes.

Dit bly egter 'n uitdaging om 'n gesonde vrug met geen kosmetiese defekte te produseer, en steeds aan van die sekondêre markvereistes van verlaagde limiete, selfs laer as die aanvaarbare limiete, te voldoen.

Hier is dit dan weereens van uiterste belang dat plaagbeheer strategieë opgestel word volgens 'n verwagte residu profiel, om seker te maak dat daar aan markspesifieke vereistes voldoen word.

Wenke aan produsente

Om werklik by die voordele van 'n bekostigbare, effektiewe en volhoubare plaagbeheer strategie uit te kom, moet produsente na die implementering van 'n geïntegreerde plaagbeheer sisteem kyk waar kulturele, biologiese en chemiese beheer opsies aangewend word om die gewenste resultate te lewer. Op dié manier kan die gebruik van chemie tot die minimum beperk word.

Die begin van enige effektiewe en verantwoordelike plaagbeheerprogram, is effektiewe spuit-toerusting en akkurate toediening.

Implementeer 'n effektiewe plaagmoniteringsisteem wat voldoen aan die regulatoriese vereistes en goed bestuur kan word. Dit moet bydra tot die neem van ingeligte besluite met betrekking tot plaagbestuur.

Beplan hierdie plaagbeheer strategie vooraf, saam met jou adviseurs en uitvoerders, met betrekking tot die hoeveelheid en vlakke van aanvaarbare chemiese residu vir die markte waarvoor jy produseer, om teleurstelling te voorkom.

Kies 'n betroubare vennoot, wat jou kan help met die opstel van 'n goeddeurdagte en koste effektiewe plaagbeheer strategie, waar 'n holistiese benadering gevolg word met volhoubare kwaliteit en kwantiteit produksie as einddoel.

Geïntegreerde Plaagbestuur

Magda du Toit
Bestuurder: Korporatiewe Skakeling
Bayer SA

Die opbou van weerstand in insekte en onkruide teen plaagmiddels is seker een van die aspekte in landbou wat vele gesprek ontlok en die bedryf bekommer. 'n Skuif in populasies van insekte of onkruide is nie dieselfde as die opbou van weerstand nie, maar dit laat ook rooi ligte flikker.

Die ontwikkeling van weerstand in onkruide en insekte is die gevolg van natuurlike seleksie wat reeds jare gelede deur natuurwetenskaplikes beskryf is.

In die natuur kan seleksiedruk veroorsaak word deur enige iets wat die voortbestaan van die individue in die populasie bedreig. In die geval van onkruide en insekte in die landbou, word die druk hoofsaaklik deur onkruid- en plaagdoders veroorsaak.

Sou 'n boer die heeltyd dieselfde plaagdoder gebruik, selekteer hy/sy uiteraard 'n populasie individue wat, oor tyd, weerstand kan opbou teen die chemiese middel. Weerstandbiedendheid in 'n populasie is die gevolg van die seleksiedruk en gebeur nie eensklaps nie, maar oor 'n tydperk.

Die antwoord is geïntegreerde plaagbestuur. Geïntegreerde plaagbestuur is een van die fundamentele beginsels waarop 'n produsent sy produksiestelsel op die plaas moet baseer. Dit vorm die basis van volhoubare produksie.

Geïntegreerde plaagbeheer vorm die basis van volhoubare beheer van plae omdat metodes wat ontwerp is om mekaar te komplimenteer, aangewend word in die bestuursprogram. Dit behels die gebruik van 'n reeks gediversifiseerde beheermetodes wat fisiese, chemiese en biologiese metodes integreer sonder om oormatig op een enkele manier staat te maak.

Hierdie beginsel geld vir alle middels - onkruid, insek en swamdoders. Plaagmiddels word gegroepeer volgens hulle meganisme van werking en dit is belangrik om te weet watter middels op dieselfde manier werk. Om 'n plaagdoder uit een groep af te wissel met 'n ander van dieselfde groep en met dieselfde meganisme van werking, gaan geen doel dien nie en gaan nie help om weerstand te voorkom nie.

Onkruidbeheer

Die bestuur en beheer van onkruid in gewasproduksie kan opbrengsverliese verhoed omdat die kompetisie tussen die gewas en ongewenste plante uitgeskakel word. Goeie onkruidbeheer kan die verskil tussen sukses en mislukking op die plaas beteken.

Onkruiddoders vergroot die opsies vir onkruidbeheer, omdat die werking minder afhanklik van omgewingsfaktore, soos klimaat en grondsoort, is as byvoorbeeld meganiese beheer. Na 'n bui reën as die grond te nat is, kan onkruiddoders toegedien word en juis uitstekend werk. Daarby kan onkruiddoders deur die besproeiingstelsel of deur 'n vliegtuig toegedien word.

Die doel van 'n onkruidbeheerprogram is om die onkruidkompetisie met die gewas te verminder, onkruidsaadproduksie te beperk en ook te verhoed dat onkruidsaadreserwes in die grond opbou of dat die onkruid na ander lande of areas op die plaas versprei. Deur goeie onkruidbeheerpraktyke te volg, kan die ontwikkeling van onkruidweerstand vertraag of selfs verhoed word.

Dit is daarom belangrik om die volgende bestuursbeginsels na te volg:

- Goeie onkruidbeheer verminder onkruidgetalle op die land. So word die kans verminder dat daardie plante wat natuurlik moeilik beheerbaar is, oorleef.
- Effektiewe onkruidbeheer met behulp van onkruiddoders begin by nougesette navolging van aanbevelings wat op produk-etikette verskyn. Lees altyd eers die etiket.
- Voorkom dat onkruidsaad vorm. Beheer die onkruid vroeg in die seisoen en voordat dit saad vorm en reproduseer.
- Verhoog die kompetisievermoë van die gewas teenoor dié van onkruid deur die gewas in die deel van die groeiseisoen te vestig wanneer toestande meer ongunstig vir die ontkieming van onkruide is.
- Optimaliseer die plantpopulasie van die gewas. Wanneer die gewasse in nouer rye geplant word, kan dit ook bydra tot beter onkruidbeheer omdat minder lig na die grondoppervlak deurgelaat word weens die blaredak wat deur die gewas gevorm word.

- Wisselbou van gewasse is ‘n goeie bestuurstelsel, ook vir die beheer van onkruid.
- Wissel onkruiddoders af. Gebruik middels met verskillende meganismes van werking. Tenkmengsels van meer as een produk wat meer as een meganisme van werking het, is ‘n goeie opsie om te gebruik mits die vereistes op die etiket gevolg word.
- Onkruidbeheer moet geskied vanaf voor-opkom van die gewas tot voor oes en selfs na oes. So kan winteronkruide effektief beheer word met die oog op vogbewaring.
- Onkruidgrootte, en níe grondkleipersentasie, bepaal die onkruiddoderdosis en gevolglik moet net gespuit word indien onkruide teenwoordig is.
- Ken die onkruid op jou lande. Dit is noodsaaklik dat onkruide geïdentifiseer kan word omdat sommige onkruide ondergrondse lopers vorm, of ander wasagtige lagies op die blare het of meer houtagtige stamme vorm. Al hierdie eienskappe gaan bepaal watter middel die beste resultate gaan gee.
- Wissel die metodes van onkruidbeheer af. Bestuur die saadbank deur chemiese toedienings, weiding, of soms meganiese beheer.
- Gee aandag aan jou spuittoerusting. Foutiewe toerusting kan meebring dat sommige individue in die populasie wat beheer word, oorgesien word en tot volwassenheid kan ontwikkel en saad kan vorm.

Geïntegreerde onkruidbestuursmaatreëls speel nie net ‘n groot rol in die beskerming van opbrengs nie, maar dit is ook kardinaal om die toename van moeilik beheerbare onkruide of selfs die opbou van weerstandige onkruide te beperk.

Insekbeheer

Daar is meer as 300 spesies insekte wat landbougewasse soos mielies aanval en wat ‘n invloed op die opbrengs of graad van die graan kan hê. In Afrika is insekte wat mielies aanval meestal endemies en val die mielies in vanaf omliggende plantegroei soos natuurlike grasse. Van die belangrikste peste wat mielies aanval, behoort aan die Lepidoptera-orde met mieliestronkboorders wat die meeste skade aanrig.

Die mees onlangse toevoeging tot die groep in Suiderlike Afrika, is die herfs-kommandowurm wat in die 2016/2017 seisoen in Suid-Afrika geïdentifiseer is.

Die gebruik van Bt-tegnologie in gewasse bied doeltreffende beheer teen insekte in mielies en katoen en vorm ‘n moderne, omgewingsvriendelike basis vir geïntegreerde plaagbeheer in die gewasse. Bt-tegnologie het die afgelope 20 jaar ’n groot rol gespeel in die beheer van stronkboorders en bolwurms in Suid-Afrika en die gebruik van dié tegnologie het grootliks die oormatige gebruik van meer gevaarlike plaagbeheermiddels uitgeskakel.

Die toepassing van ‘n insekweerstandbestuursprogram is van kardinale belang in geïntegreerde plaagbeheer. Só bestuursprogram bestaan uit die volgende komponente:

- Kennis van die pes se biologie en ekologie.
- ‘n Rekordhoudingstelsel van die insekdoders wat op ‘n land gebruik is.
- Die plant van toevlugsareas waar die vatbare insekte kan aanteel en floreer.
- Die monitering, aantekening en aanmelding van insekte wat moontlik weerstandig kan wees.
- Die toepassing van geïntegreerde plaagbeheer praktyke.
- Kommunikasie en opleiding.

'n Toevlugsarea is 'n gedeelte van die plaas wat streng met nie-Bt-mielies aangeplant word. Hier word die stronkboorders dus nooit aan Bt-tegnologie blootgestel nie. Seleksiedruk vir Bt-weerstand is dus onbeduidend en die individuele stronkboorders wat in 'n toevlugsarea voorkom, is feitlik almal vatbaar vir die beheer wat deur die Bt-tegnologie gebied word. Die doel daarvan is om te sorg dat daar 'n populasie vatbare motte beskikbaar is wat met die tolerante motte wat op die Bt-mielies of -katoen oorleef het, kan paar. Sodoende word daar verhoed dat die motte wat oorleef het, met mekaar kan paar en dat die nageslag van die motte tolerant sal wees.

'n Belangrike aspek van die suksesvolle implementering van 'n toevlugsarea en 'n insekweerstandbestuursprogram is die volgehoue monitering van stronkboorder of bolwurmpopulasies in die Bt-aanplanting sodat tydige ingryping kan geskied en insekdoder toegedien kan word sodra dit lyk asof die stronkboorder- of bolwurmspopulasies nie voldoende beheer word nie.

Food for Thought

Recycling of Pesticide Containers on the Increase

CropLife SA has been instrumental in combatting plastic pollution through the recovery of used plastic agricultural pesticide containers in South Africa. About 62% of all pesticide containers used in South Africa are currently recovered and recycled through the organisation's network of service providers.

Annelie Coleman
Farmer's Weekly
14 June 2019

"We take plastic pollution very seriously and our objective is to become a leader [when it comes to] in the recovery and recycling of polyethylene pesticide containers and polypropylene bags used for seed," said CropLife SA spokesperson Elriza Theron.

The company's recovery rate would not have been possible without the commitment of farmers, Theron said. Awareness about responsible stewardship was increasing, a trend underscored by farmers' growing sense of environmental accountability. The plant protection industry used 8 000t polyethylene pesticide containers annually, and during 2018 about 5 000t were recovered. CropLife SA aimed to recover and recycle 90% of used containers by the end of 2021.

An initiative to recover and recycle polyethylene bags would be launched soon, Theron said. She called on farmers to familiarise themselves with the guidelines for cleaning containers and bags on the CropLife SA website.

She cautioned them to dispose of empty containers only through companies and individuals officially approved by CropLife SA. The empty containers should be triple-rinsed on the farm to remove all traces of pesticide residues, as deposits of pesticides made the containers unfit for recycling.

Voorkoming in Plaagbeheer is Beter as Genesing

Dr Gerhard Verdoorn
AgriAbout
Junie 2019

Die klimaatstoestande is besig om drasties hier op aarde te verander of Donald Trump dit wil glo of nie. Dit veroorsaak beduidende impakte op die samelewing en landbou gaan ook onder druk as gevolg van klimaatsverandering. Nie alleen is reënval wispelturig nie, maar ook seisoene wat nie meer hul normale patrone volg nie.

Laat somers, warm winters, verwoestende storms, ernstige droogtes en snerpende koues is alles dinge wat die boer seermaak. Daarmee saam word die bestaande patrone van peste en plae ook versteur en krap produsente se planne deurmekaar. Insekplae wat nog nooit in gewasse teenwoordig was nie, dop skielik uit en vang boere onkant. Swamsiektes kom voor in tye en plekke waar dit glad nie verwag word nie. Dit raak uitdagend om winsgewend te boer.

Gelukkig is daar in die moderne era baie tegnologie tot die boer se beskikking om plaagbeheer effektief aan te pak, maar dis altyd beter om voorkomend op te tree as reaktief te moet sukkel om 'n ongewenste insek die hoof te bied. Moderne landbou vorder sterk op pad na presisie-landbou waar dinge fyn beplan word om meer suksesvol en koste-effektief te wees. Deel van presisie-landbou is vroeë waarskuwingstelsels wat enige boer behoort te gebruik om homself vroegtydig te vergewis van moontlike peste, plae en siektes wat sy gewasse mag bedreig.

Weerpatrone

Die weer is een van die grootste rolspelers in plaag- en siekte-ontwikkeling. Weereens moet ons gebruik maak van die beskikbare tegnologie en daar is genoegsame langtermyn weervoorspellingsmodelle wat boere gratis kan raadpleeg om inligting oor weerpatrone te bekom ten einde te bepaal watter plae en siektes moontlik kan ontstaan. Veral plantpatogene toon 'n sterk verwantskap met weersomstandighede en dus kan boere planne maak om vroegtydig die regte swamdoders aan te wend om swamme in die kiem te smoor.

Ons het die afgelope twee jaar ook geleer dat goeie reën na langdurige droogtes die Lepidoptera peste (wurmplae) soos 'n vloedgolf oor die landbou stuur. Die herfskommandowurm het ons lelik onkant gevang en nie lank daarna nie, het die Afrika-bolwurm en ander spesies ook op grootskaal chaos in gewasse veroorsaak. Boere moet dus kennis neem van die weer en die patrone gebruik om self te voorspel watter peste en plantsiektes moontlik in gewasse mag ontwikkel, veral as temperature klim, reën begin val en lugvog styg.

Visuele waarnemings en feromoonlokvalle

Die wurmplae word vroeg waargeneem as daar mot beweging in landerye is. Motte vlieg net voor sononder rond en as dit lyk of "mot wolke" oor landerye of oor boorde beweeg dan is daar sonder twyfel 'n plaag op pad. Dit is raadsaam om net voor sononder elke aand om die boorde en landerye te ry en te kyk of daar motte teenwoordig is. Saam met waarnemings is feromoonlokvalle die beste "voorbehoedmiddel" teen wurmplae.

Lokvalle wat met feromone toegerus is, lok mannetjie motte en as mens dan elke dag die tellings doen sal jy baie vinnig weet as daar 'n skielike toename is. Feromone is alreeds op 'n redelike skaal in Suid-Afrika geregistreer en die inligting oor sulke produkte is beskikbaar op ww.agri-intel.com. Dit is raadsaam om die motte korrek te identifiseer want dit gaan die beheerstrategie dikteer. Daar is gelukkig baie entomoloë in landbou chemiese maatskappye, by die LNR en akademiese instansies wat met graagte motte kan identifiseer.

Vroeë beheer is noodsaaklik

Ons moet weer onsself herinner aan die herfskommandowurm en ook die Afrika-bolwurm. Toe boere hulle oë uitvee was die herfskommandowurm al so "groot soos 'n Bloutrein" en geen piretroïed kon die wurms doodkry nie. Die herfskommandowurm is weerstandig teen piretroïede en enige entomoloog sal saamstem dat dit 'n futiele poging is om volwasse wurms met 'n piretroïed te takel.

Dieselfde het gebeur met Afrika-bolwurm in kanola: die produsente het eers van die plaag bewus geword toe die wurms soos treine gelyk het. In terme van wurmplae is gereelde inspeksie van die gewas net so belangrik as om feromoonlokvalle in te span en saans vir mot wolke te soek. Eierpakkies op blare is soos 'n oorlogsverklaring en die boer moet planne in plek stel om die wurmpies te spuit net sodra hulle uitbroei.

Dit is wanneer die wurmplaag op sy kwesbaarste is en nog geen skade aangerig het nie. Dan werk die sagter middels ook baie effektief en 'n goeie bespuiting sal waarskynlik die seisoen se wurms 'n ernstige knou toedien.

Daar is ook rede om te glo dat voorkomende beheer vir kewerplae en selfs wurmplae in bewaringsbewerking noodsaaklik is. Dit beteken dat die gewasreste waarin eiers en papies mag skuil, vernietig moet word deur in te dis en soos in die ou dae onder die grond te bêre waar dit vernietig mag word. Dieselfde geld vir nagmuise: dit is raadsaam om een keer elke vier jaar voor die plantseisoen landerye deeglik diep te ploeg om nagmuisneste en -tonnels te vernietig.

Onkruidbeheer is ook noodsaaklik

Onkruid het 'n hele paar negatiewe eienskappe waarvan sommiges nie altyd bekend is nie. Water en bemestingstof gebruik is maar slegs twee van die impakte wat boere moet trotseer terwyl die ander effekte waarskynlik net so nadelig vir gewasse is.

Onkruide is altyd 'n veilige hawe vir plantpeste wat vanaf onkruidstande gewasse invaar en skade veroorsaak. So ook mag plantpatogene in onkruide skuil net om te ontplof wanneer weersomstandighede gunstig raak en die swamme sporileer om gewassiektes te veroorsaak. Sommige onkruide mag selfs toksiene vrystel wat gewasse kan beskadig. Daar is dus genoeg rede om onkruide vroegtydig uit te wis sodat hulle impak op gewasse gekanselleer kan word.

Samevatting

Plaag-, onkruid- en siektebeheer is 'n duur storie en as dit net reaktief gedoen word, kos dit die produsent te veel. Dit is baie meer winsgewend om vroeg die beheer in plek te stel maar dit gaan verg dat produsente die weer en insekbevolkings fyn moniteer met die beskikbare tegnologie.

Who are you Buying your Agrochemicals from?

Rod Bell
SA Grain
June 2019

Crop protection is such a crucial part of a successful harvest and many years are spent on research and development by agrochemical manufacturers to provide a producer with products that comply with exceptional standards, but have you ever stopped to think about the person who is selling and recommending these products to you?

It goes without saying that someone who is in a position to sell and recommend potentially hazardous substances that could pose an extreme risk to not only a producer's entire harvest, but also the environment and consumers, should be qualified and abide by the highest ethical standards, but how can a producer be assured of this?

As the industry body that represents the crop protection industry, CropLife South Africa embarked on a journey some years ago in order to answer these questions, and the solution came in the form of a Continuous Professional Development (CPD) programme aimed at distributor member sales agents.

The objective of the programme is to ensure that all agrochemical sales agents of distribution member companies are provided with a range of learning activities whereby they can maintain and enhance their professional competencies and knowledge throughout their careers to ensure good practice. The programme also aims to advance and promote the status of the agent as a specialist adviser and service provider acting in the interest of the environment, community and the producer.

The programme covers topics such as technical training, business-related training, all aspects of safety, health and environment, responsible use of pesticides as well as overviews of responsible marketing and sales at retail level. Once the agent has obtained the required number of CPD points, he/she is considered an accredited crop adviser and issued with a CropLife SA CPD accreditation card with a unique member number.

Figure 1: Insist on seeing this card before buying your agrochemicals

CropLife South Africa is the accreditation body for its members and is responsible for the administration of this accreditation based on SANS1606:2014. This National Standard was developed to cover the elements of an accreditation system. The standard prescribes a primary qualification to become accredited in the industry, which, for our members, is the AgriSETA accredited Basic Crop Protection course offered by CropLife SA, as well as participation in and compliance with the minimum requirements of the CPD programme to maintain accreditation. This is to ensure that all distributor member agricultural specialists in the plant science industry in South Africa keep up with changes in the industry, provide products and services in line with the latest technology and needs of clients, continuously improve the image of the industry and embrace the commitments of the profession.

What the CropLife SA accreditation means for a producer is that they can have peace of mind in knowing the person they are buying their products from is qualified, up to date with industry knowledge and adheres to the CropLife SA code of conduct. Accreditation by CropLife SA is also important for auditing purposes such as GLOBALG.A.P, which is of great value to export producers.

CropLife SA encourages all producers to insist on this accreditation before purchasing agrochemical products.

Grain SA's Bee-Friendly Guidelines

Annelie Coleman
Farmer's Weekly
21 June 2019

It was to be hoped that South Africa's canola producers were committed to ensuring healthy bee populations and the proactive use of bee-friendly insecticides registered for canola, said Dr Gerhard Verdoorn, CropLife South Africa's operations and stewardship manager.

This followed an announcement by Grain SA that the organisation had drafted a best practice and guideline document in this regard. However, it remained the responsibility of beekeepers to obtain permission from farmers to place beehives on canola lands, Verdoorn said.

He added that in South Africa all pesticides were regulated by the Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act No. 36 of 1947, and that anyone accidentally or deliberately killing bees with a pesticide would be contravening the Act.

Registration holders of insecticides had to undertake extensive research and trials to prove the efficacy and compatibility of the products, with the natural and human environments. Honeybees were the world's best-known pollinators of natural flora and a vast array of food and fiber crops, Verdoorn said.

"Technically there is no reason for bees to perish because of the irresponsible use of pesticides on canola lands. All 22 products registered for canola are labelled clearly in accordance with the law on methods and time periods of use."

It was essential that farmers and beekeepers maintained close communication, and producers were encouraged to use the BeeMap mobile phone app, Verdoorn said.

Die Heuningmakers se Toekoms is op die Spel

Dr Gerhard Verdoorn
Agri-About
September 2019

Daardie bottel op die rak met die goue, stroperige vloeistof is uiters gesog by alle mense alhoewel dit 'n plaas se prys is. Sedert oertye is heuning nie alleen die natuur se wondergawe as soetgoed vir die mens nie maar ook die bron van baie geneeskundige waarhede omdat dit heeltemal natuurlik is en mikro-hoeveelhede natuurlike geneesmiddels bevat. Dit was eers in die 20ste eeu wat mense die besonderse waarde van die heuningmakers ontdek het toe iemand besef hulle is verantwoordelik vir bestuiwing van natuurlike plantegroei en 'n groot persentasie voedselgewasse.

Dit is ondenkbaar dat mense nie die grootste respek vir bye het nie en soms wil ek bye met perde vergelyk. Oor die aarde heen is perde in een of ander vorm nog altyd verbind aan die voortbestaan en vooruitgang van die mens en dis selde dat daar ooit berigte van grootskaalse perde-uitwissing in die media is.

Tog, as dit by die heuningby kom, is ons in Suid-Afrika al goed gepeper met berigte oor bye wat op grootskaal vergiftig word. In die afgelope drie jaar was daar nie minder as drie grootskaalse bye-uitwissings in die Wes-Kaap as gevolg van plaagdoders. Die prys is betaal nie alleen deur die bye nie maar ook deur die byeboere wat hul boerderye verloor het.

Verkeerde en onverantwoordelike plaagdodergebruik is die oorsaak van die byesterftes en CropLife SA probeer die saak beredder deur met die Suid-Afrikaanse byebedryf en gewasprodusente saam te werk. Nie alleen bye wat bestuiwingswerk doen word uitgewis nie maar die wilde bye wat hul bestuiwingswerk in die inheemse plantegroei doen word ook aangetas. Dit is 'n uiters kommerwekkende situasie en veral as gerugte dat bye soms doelmatig doodgespuit word die waarheid is. Sonder bye om te bestuif gaan daar twee goed manifesteer: gewasse gaan nie hulle produkte soos vrugte lewer nie en die veldflora gaan nie saad produseer om aan te was nie.

Hoe gemaak om bye teen plaagdoderimpakte te beskerm?

Geen plaagdodervervaardiger het dit al ooit ten doel gehad om bye dood te maak nie. Navorsing tydens die ontwikkeling van 'n plaagdoder is juis daarop gemik om die moontlike impak van veral insekdoders te voorkom deur spesifieke veiligheidsmaatreëls vir bye op die etikette aan te bring. As daardie maatreëls nagekom word, is die kans vir impak op bye uiters gering. Die probleme begin wanneer etikette nie streng nagevolg word nie.

Dit is veral wanneer plaagdoders op gewasse gespuit word wat nie daarvoor geregistreer is nie. Verder is daar metodes van aanwending wat uiters riskant vir bye mag wees, soos wanneer lugbespuiting van imidaklopried op koring onwettig gedoen word en daar kanola naby is waar bye besig is met nektar- en stuifmeelversameling. Die groot evangelie rondom bye en plaagdoders is dus om die etikette streng na te volg, en in besonder die volgende:

- Gebruik plaagdoders slegs op gewasse waarvoor dit geregistreer is;
- Wend plaagdoders slegs met die toerusting aan soos op die etikette aangedui;
- Wend plaagdoders binne die aanwendingsperiode aan soos op etikette aangedui;
- Volg die bye-veiligheidsmaatreëls soos op etikette aangedui.

Daar gaan noodwendig situasies wees waar bye naby gewasse mag wees wat met insekdoders behandel moet word. Hierdie bye is meestal met bestuiwingswerk besig en is uiters sensitief vir enige plaagdoders wat mag oordryf na die gewasse wat hulle bestuif. Dit is dus noodsaaklik dat die gewasprodusent wat moet spuit in noue kontak met die byeboer moet wees. 'n Nuwe slimfoontoepassing, BeeMap Africa, is ontwikkel om as 'n vroeë waarskuwingstelsel tussen gewasboere en byeboere op te tree. Wanneer die gewasboer beplan om te spuit, sleutel hy sy data in en die selfoon van die byeboer stuur onmiddellik 'n waarskuwing wat die byeboer vroegtydig in kennis stel van die beplande spuitaksie. Dit sal dan die byeboer kans gee om die korwe genoegsaam te beskerm of te verwyder, te einde vergiftiging vry te spring.

Sommige gewasprodusente skakel oor na vroeë aand bespuiting wanneer bye nie meer aktief is nie. Dit is nie altyd moontlik nie want die weersomstandighede speel 'n groot rol, maar ten minste is die bye dan rustig in die korwe en word nie direk geaffekteer deur bespuitings nie.

Meeste plaagdoders se risiko vir bye neem beduidend af wanneer die middels op die gewas afgedroog het en dit help dan ook om bye te beskerm as die middels in die aand gespuit word.

Sommige plaagdoders bevat spesiale bymiddels wat die aktiewe bestanddeel reënvas binne twee tot vier ure maak; die voordeel daarvan is dat dou die volgende oggend nie die aktiewe bestanddeel weer in oplossing sal plaas om bye te benadeel nie.

Planne om bye te ondersteun

Benewens die maatreëls om bye teen plaagdoders te beskerm, is daar ook 'n toenemende neiging om maatreëls te implementeer wat direk tot bye se voordeel strek. Een van die mees belangrike dinge is om te verseker dat bye altyd kos beskikbaar het. Mens sal dink dis ondenkbaar dat bye kan honger ly, maar met die eienaardige weerpatrone en knellende droogtes is die lewe vir bye glad nie maklik nie. Wes-Kaapse boere kan bye tot 'n groot mate van verhongering red deur 'n mosaïek van inheemse blomplante aan te plant wat vir bye die nodige nektar en stuifmeel kan voorsien wanneer gewasse wat normaalweg hulle bron van kos is, dormant is.

Aalwyne en fynbos is 'n wonderlike kombinasie met geen onderhoudskoste vir die boer nie. Plant hierdie plante langs landerye, langs boorde, tussen wingerde en sommer in die padreserwes ook, sodat bye 'n gesonde en konstante verskeidenheid plantsoorte as voedselbron kan hê. Waar byekorwe soms deur ratels getakel word, raak byeboere knorrig en die konflik mag tot pogings lei om die ratels dood te maak. Weereens is daar oplossings wat tot voordeel van produsente, byeboere en ratels is: plant 'n staalpaal en plaas die korf daarop (omtrent 1.2 meter hoog) want dan kan die ratel nie die korf bykom nie, die bye is buite gevaar, die byeboer se gal word nie suur vir die ratels nie en die gewasboer se bestuiwing word gedoen.

Belangrike wenke ter beskerming van bye

CropLife Suid-Afrika stuur 'n baie belangrike pleidooi aan alle Wes-Kaapse boere, naamlik dat plaagdoders met groot omsigtigheid gebruik moet word. Daar is die afgelope drie jaar ernstige skade aan bye gedoen as gevolg van onwettige gebruik van plaagdoders op kanola, koring, sitrus en wingerde. Dit skep nie alleen 'n groot probleem vir byeboere nie, maar skep 'n swak indruk van landbouers by die algemene publiek. Die grootste gevaar lê waarskynlik vir die uitvoerbedryf want as die buitelandse uitvoer/invoer sertifiseringsagentskappe uitvind dat bye doodgemaak word as gevolg van onverantwoordelike praktyke, kan sulke agentskappe dit maklik as 'n handelsboikot teen Suid-Afrika gebruik.

Indien produsente die plaagdoders se etikette streng navolg, is die moontlikheid van enige negatiewe impakte uiters gering, selfs vir bye. Hou by etiketvoorskrifte en hou die Wes-Kaapse bestuiwers gesond en lewenskragtig.

One's Trash is Another's Thriving Business

As a core focus at this year's G20 Summit, the need to reduce waste – particularly plastic – as a way to combat climate change is clear. In 2017, the world's plastics production totalled around 348 million metric tons.

Published in
Grocott's Mail
26 August 2019

While South Africa accounts for less than 0.5% of global plastic production, this still amounts to 1.5 million tons of plastic consumed in South Africa annually and it's up to both businesses and consumers to take make a change.

Port Elizabeth-based Rhino Manufacturing has found a way to turn this trash into cash. The level 2 B-BBEE company which forms part of the Rhino Group, makes 90% of their product from waste materials, bringing new meaning to the phrase "one man's trash is another man's treasure."

"We're very passionate about what we do, and value our contribution towards a greener economy," says newly appointed Managing Director, Siyabulela Mandla.

Rhino Manufacturing produces high- and low-density pipe, plastic film, packaging, nursery bags and pallet wrap for the construction, automotive and agriculture sectors. The company collects waste from their local industrial clients, private waste collectors, waste management companies as well as communities and municipalities. More than 150 tons of plastic waste is processed per month, saving more than 10 000 cubic metres of landfill space each year.

"We are currently the biggest recycler of plastics waste in Port Elizabeth, which is in line with our circular green economy model that promotes the reproduction, reuse and repurpose of plastic to ensure sure that no waste goes to a landfill," adds Mandla.

The company has partnered with local farmers through Crop Life South Africa to collect agricultural plastic waste, such as pesticide drums and irrigation pipes. CropLife is a non-profit industry association that serves and represents responsible manufacturers, suppliers and distributors of sustainable crop protection and public health solutions in the agricultural, public health, non-crop and consumer sectors of South Africa.

"Traditionally, when these items had reached their end of life, they were often burned causing more air pollution. This is no longer the case as Rhino converts the waste plastic into raw material, which is used as input material for manufacturing their products," he explains.

Mandla refers to himself as a township entrepreneur and is excited at the opportunity to strengthen and grow the business. "The construction industry is currently very depressed in South Africa, so we are focusing on growing our share of the agricultural market by expanding our product range as well as looking at what we can offer the public sector. Given the explosion in fibre optics in the country, we now also manufacture high density pipes which are used for underground sleeving for fibre optics and are looking at partnerships with fibre optic installers to penetrate this market," says Mandla.

"We're proud of what we've achieved when it comes to sustainability and limiting the level of plastic waste in the area and will continue to operate with our green objectives at the forefront of what we do," he concludes.

Convergence Between Integrated Pest Management and Biotechnology

Published in
AgBiz eNewsletter
30 August 2019

South Africa's biotech crop adoption increased by a further 3% in just one year between 2017 and 2018. The GM/biotech crop status in South Africa compares well with international trends according to Mariana Purnell, general manager of Agbiz Grain.

Industry continues to invest in the development of new technologies in a range of crops and there is continued convergence between traditional plant protection products and biotechnology in all its forms.

This was confirmed by the CEO of CropLife SA, Rodney Bell, at the 2nd annual Hans Lombard Memorial Information Session on the GM/biotech crop status in South Africa, when he informed the conference on the new CropLife SA structure and how the focus of the organisation now complements integrated pest management and biotech crop adoption. Pest management does not increase the potential of a crop to produce a high yield, it only protects the crop against yield losses. Biotechnology is another tool, along with traditional plant protection products, available to CropLife members in their offering to help growers realise the yield potential of their crops. Traditional plant protection products and biotechnology are therefore not competing with each other, but rather are complementary to each other in todays' integrated crop production efforts aimed at providing food security globally.

Riglyne vir die Oprigting en Bestuur van Plaagdoderstore op Plase

Dr Gerhard Verdoorn
SA Graan
September 2019

Elke plaas in Suid-Afrika maak gebruik van plaagdoders, hetsy sintetiese, natuurlike, biologiese of selfs organiese plaagdoders. Sulke middels wat as landboumiddels in die Wet op Misstowwe, Veevoedsel, Landboumiddels en Veemiddels, 1947 (Wet Nr. 36 van 1947) bekend staan, is produkte wat 'n bepaalde gevaar vir mense en die omgewing mag inhou.

Dit is egter moontlik om die risiko wat plaagdoders inhou te bestuur deur die nodige bestuursmaatreëls in plek te stel. Vrugte- en groente-uitvoerprodusente is alreeds onderworpe aan die sertifiseringsagentskap GLOBALG.A.P. se vereistes, nie slegs vir die verantwoordelike gebruik van plaagdoders nie, maar ook vir die veilige berging daarvan op die plaas. Alhoewel min graanprodusente self direk uitvoer, is dit sinvol om ook bepaalde riglyne te volg vir die veilige berging van plaagdoders ten einde die risiko te verminder.

Ligging

Dit is raadsaam om die plaagdoderstoor ver weg van enige waterbronne soos stroompies, riviere, damme, panne en boorgate op te rig. Dit moet ook weg van enige wonings, melkstalle, krale of hokke geleë wees.

'n Goeie area is langs die stoor waar die implemente en trekkers geberg word. Bou die plaagdoderstoor aan die oostekant van die trekkerstoor sodat die middagson gekeer word. Dit sal die stoor redelik koel hou.

Konstruksie

Die konstruksie van die stoor moet stewig van bakstene of beton wees met 'n digte dak wat nie die stoor noodwendig laat oorverhit nie. Konstruksiemateriaal moet verkieslik nie brandbaar wees nie. Die gebou moet goed geventileer wees – uittrekwaaiers is dus belangrik en dit moet verkieslik op die dak gemonteer wees. Vloere moet van beton gegiet wees (ten minste 75 mm dik), gelyk en glad afgewerk sodat enige verspilde plaagdoders nie in gleuwe inloop of deur die beton geabsorbeer word nie.

Deure en vensterrame moet van staal wees en daar behoort 'n stewige staalveiligheidshek by die ingang te wees. Só 'n gebou sal ook diefstal bekamp. 'n Ryvlak van beton wat sowat 5 m wyd is, sal toegang vergemaklik. Dit is raadsaam om 'n betonpaadjie van 500 mm wyd om die stoor te giet en dit dan af te rond met 'n twee baksteen hoë keermuur. Indien daar grootskaalse verspilling is, sal dit deur die muurtjie ingeperk word.

Waarskuwings

'n Groot waarskuwingsbord van minstens 750 mm x 500 mm moet langs die stoor se deur aangebring word met die volgende items daarop:

- Skedel en kruisbeen in rooi saam met die woord gevaar in dik rooi letters.
- Toegang slegs vir gemagtigde persone in dik swart letters.
- Plaagdoderstoor in dik rooi letters.
- Rook, eet en drink verbode in dik swart letters.
- Beskermende klere in dik swart letters gevolg deur die items wat gedra moet word soos rubberstewels, rubberhandskoene, volle oorpak, gesigmasker en hoofbedekking.
- Noodnommers in dik rooi letters gevolg deur:
  - o plaaseienaar se naam plus telefoonnommer;
  - o bestuurder se naam plus telefoonnommer;
  - o brandweer plus telefoonnommer;
  - o polisie plus telefoonnommer;
  - o hospitaal plus telefoonnommer; en
  - o gifinligtingsentrum plus telefoonnommer.

So 'n bord behoort buite op ten minste een ander muur aangebring te word.

Noodtoerusting

Voldoende brandbestrydingstoerusting, naamlik droëmateriaalbrandblussers en sand, moet beskikbaar wees. Daar moet ook 'n standaard noodhulpkissie in die stoor wees wat verkieslik in 'n lugdigte plastiek-trommel geberg word sodat dit nie deur plaagdoderdampe gekontamineer word nie.

Daar moet 'n oogspoelbak met skoon water beskikbaar wees. Dit kan 'n gewone plastiekdrom wees met 'n sagte plastiekbottel waarmee water in die oë gespuit kan word. Opruimingstoerusting vir verspillings 'n 210 ℓ-oopbekplastiekdrom met 'n deksel, groot plastieksakke, 'n plastiese of vlekvryestaalgraaf, skoppie, plastiekbesem, vermikuliet en saagsels is nodig om verspillings op te ruim.

Die vermikuliet of saagsels word oor die verspilde materiaal gestrooi en vir 'n halfuur gelaat om dit te absorbeer, waarna dit met die besem, graaf en skoppie opgetel en in 'n plastieksak gegooi word. Seël dan die sak met sterk kleefband en stoor dit totdat dit afgevoer kan word vir vernietiging deur 'n maatskappy wat in die bestuur van gevaarlike afval spesialiseer. Kyk op www.croplife.co.za onder *Waste Management* vir dié maatskappye se kontakbesonderhede.

Waarskuwingskennisgewings

Binne die stoor moet die volgende kennisgewingborde aangebring word:

- Brandtoerusting
- Beskermende klere wat gedra moet word
- Ontsnaproetes
- Oogspoelbak
- Eet, drink en rook verbode

Hierdie tipe tekens is by koöperasies en hardewarewinkels beskikbaar.

Veilige berging en veilige werksplek

Dit is raadsaam om plaagdoders altyd op nie-absorberende rakke of plastiekpalette te berg. As houers op die betonvloere staan, dam water op en maak dit die houers klam en beskadig die etikette. Onkruiddoders wat met pers vierkante op die etikette geïdentifiseer word, moet altyd heel onder geplaas word as middels op verskillende rakke geberg word. Insekdoders en swamdoders moet bo onkruiddoders geberg word. Alle rooibandprodukte moet agter slot en grendel gebêre word. Vlambare middels moet van nie-vlambare middels geskei word en apart geberg word.

Maak seker etikette van houers word nie beskadig nie en hou altyd 'n lêer met 'n etiketafskrif van elke middel op datum. Skoon water moet by die stoor beskikbaar wees en 'n veiligheidstort moet verkieslik buite opgerig word. Alle beskermende klere, insluitend die respirators en filters wat gebruik word, moet in 'n lugdigte plastiektrommel in die stoor gebêre word – dit kan ook die trommel wees waarin die noodhulpkissie geberg word. Die stoor moet altyd gesluit wees en die sleutel moet deur slegs een verantwoordelike persoon gehou word.

Rekordhouding

'n Voorraadboek moet bygehou word waarin alle inkomende voorraad aangeteken word en die voorraad wat gebruik word moet daarteen ingeskryf word. Handhaaf die beginsel dat die oudste middels altyd eerste opgebruik word en die nuwe voorraad eers gebruik word as die ou voorraad op is.

Klop Plaagdoderweerstand met Slim Planne

Baie mense is skepties oor Charles Darwin se ewolusieteorie, maar daar steek ernstige wetenskaplike waarheid in. Organismes het deur millennia ontwikkel en gedurig aangepas by veranderende omstandighede.

Dr Gerhard Verdoorn
SA Graan
September 2019

Mense interpreteer dikwels Darwin se teorie verkeerd, naamlik dat die sterkste of fiksste individue oorleef. Sterk of fiks is geen waarborg vir oorlewing nie, maar wel of die individu van 'n bevolking kan aanpas by veranderende omstandighede. Natuurlike seleksie is dus die proses waarin die aanpasbare individue van die spesies oorleef.

Die Neandertalmense was na alle waarskynlikheid baie sterker as Homo Sapiens, maar hulle kon nie aanpas by die verandering in die aarde se klimaat en ekosisteem nie en het stadig van die aardbol af verdwyn. Natuurlike seleksie het hulle uit die ekosisteem verwyder.

Landbouplae, onkruide en patogene se weerstand teen plaagdoders

Binne enige bevolking van 'n spesie is daar redelike tot groot genetiese diversiteit. Hoe groter die genetiese diversiteit binne die spesie is, hoe beter is die kans dat dit omgewingstressors kan oorleef. Alle spesies is gedurig besig om aan te pas – met die mees aanpasbare individue wat oorleef en die spesie voortdra die toekoms in.

Wanneer die genetiese diversiteit klein is, kan omgewingstressors die spesie geredelik laat uitsterf. Plantpeste, onkruide en patogene is ook soos ander spesies aan 'n verskeidenheid stressors onderworpe. Wat die toepassing van plaagbeheer doen, is om die spesie baie vinnig aan 'n geweldige groot stressor bloot te stel. Die resultaat daarvan is dat die natuurlike seleksieproses vir individue in die plaagspesie drasties verhaas word.

Alle spesies het in hul geledere individue wat meer aanpasbaar as ander is by die verandering wat plaagdoders op hulle afdwing. Dit is nie asof die mens weerstand met plaagdodergebruik skep nie. Die weerstand bestaan inherent, maar word slegs gekataliseer met die gebruik van plaagdoders.

Hoe plaagdoderweerstand in 'n plaagspesie verhaas

Gestel binne 'n spesie is daar 90% van die individue wat vatbaar vir die plaagdoder se effek is, 5% wat weerstandig teen die plaagdoder is en 5% wat geringe weerstand teen die plaagdoder het. Wanneer die plaagdoder streng volgens etiket aangewend word, word die grootste deel van die vatbare individue uitgewis, die weerstandige individue oorleef en die semiweerstandige individue oorleef ook in 'n groot mate. Al die oorblywende individue (vatbaar, weerstandig en semiweerstandig) teel en bring nuwe bevolkings van die spesie voort.

Daar sal "verbastering" tussen die weerstandige, semiweerstandige en vatbare individue wees asook "eiesoortige" teling, met ander woorde weerstandige individue wat met ander weerstandiges teel. Wat na die eerste teelseisoen manifesteer, is 'n spesie met die bevolkings wat redelik na is aan dít wat voor die plaagdodertoediening plaasgevind het, met 'n effense verskuiwing na die meer weerstandiges in die bevolking.

As dit seisoen na seisoen só plaasvind, sal die weerstandige deel van die spesie baie stadig groei tot waar dit na jare die plaagdoder totaal kan uitoorlê.

Die grootste katalisator vir versnelde weerstandsontwikkeling is wanneer dieselfde plaagdoder jaar na jaar óf onder die aanbevole dosis óf bo die aanbevole dosis aangewend word.

Oordosering

Oordosering se effek is eenvoudig: Dit elimineer feitlik al die vatbare individue sowel as die meeste van die semiweerstandige individue wat dan 'n bevolking wat deur weerstandige individue gedomineer word, voortbring. Wanneer daar geteel word, is die persentasie vatbaarheid vir die plaagdoder bitter klein en die bevolking is tegnies weerstandig. Die daaropvolgende seisoen is die doodsteek vir die plaagdoder, want die enkelinge wat nog vatbaar is sowel as die skaars semiweerstandiges word uitgewis en al wat oorbly is die weerstandiges. Om dan weer dieselfde plaagdoder aan te wend, is futiel, want dit sal geen effek op die weerstandige individue hê nie.

Onderdosering

Onderdosering is net so 'n groot sondaar as oordosering. Met onderdosering word te min van die aktiewe bestanddeel toegedien met die gevolg dat geen van die semiweerstandige individue uitgewis word nie. Alhoewel daar meer van die vatbare individue oorbly, help dit nie, want met die aanteel is daar nou persentasiegewys baie meer semiweerstandiges wat hul weerstandige gene in die vatbare deel van die bevolking inteel.

Saam met die weerstandiges se aanwas is daar nou 'n verskuiwing van die bevolking na die weerstandige kant wat niks goed vir die plaagdoder voorspel nie. As dieselfde onderdosering oor 'n paar seisoene plaasvind, is die plaagspesies vinnig op pad na totale weerstand.

Buffers teen weerstand

Daar is verskeie maatreëls wat produsente kan instel om weerstand teen plaagdoders te fnuik.

Volg altyd die etiket se aanbevelings

Die etiket se aanbevelings is die resultaat van jare se navorsing en groot finansiële beleggings om seker te maak die dosis wat op die etiket is, is die dosis wat die plaag sal beheer sonder om noodwendig weerstand te kataliseer.

Nog iets wat van kritieke belang is, is die metode en tegnologie van toediening. Al word die tenkmengsel korrek voorberei, kan die dosis verkeerd toegedien word as die tegnologie nie met die gewas versoenbaar is nie. 'n Voorbeeld hiervan is wanneer 'n insekdoder met lugbespuiting op volgroeide mielies toegedien word.

Gewoonlik is die spuitvolume met lugtoediening rondom 40 liter/ha tot 50 liter/ha. Dit is totaal onvoldoende om die plaagdoder in die mielieplant in te "was" waar die ruspes met hul vernietiging besig is. Dieselfde dosis plaagdoder met 'n oorhoofse trekkerspuit teen 300 liter spuitvolume per hektaar is baie meer effektief en sal die plaagdoder teen die regte dosis by die teiken besorg.

Maak gebruik van die korrekte bevorderingsmiddels
Bevorderingsmiddels sluit chemiese stowwe soos buffers, kleefmiddels, benatters en dryfweermiddels in, wat almal ten doel het om die aktiewe bestanddeel optimaal op die teiken toe te dien. Onkruiddoders faal dikwels as gevolg van hardheid in water of die verkeerde pH, terwyl dit maklik met buffers en versagmiddels aangespreek kan word. Kleefmiddels is vir insekdoders, swamdoders en onkruiddoders belangrik omdat dit die aktiewe bestanddele laat klou waar dit hoort.

Sommige plaagdoders het kleefmiddels in die formulasies ingebou, terwyl ander weer 'n kleefmiddel as tenkmengsel benodig.

Wissel die weerstandsgroepe met mekaar af
Elke plaagdoderetiket dui aan watter weerstandsgroep die "eienaar" van die aktiewe bestanddeel is. Die groep word gewoonlik net onder die aktiewe bestanddeel op die hoofpaneel aangedui as HRAC (onkruid), IRAC (insek en myt) of FRAC (swam). 'n Voorbeeld is die kode vir glifosaat, naamlik "HRAC groep G" en vir atrasien "HRAC groep C1". Dit beteken dat die produsent die groepe onkruiddoders moet afwissel. Dit sal byvoorbeeld goed wees om glifosaat "HRAC groep G" met glufosinaatammonium "HRAC groep H" af te wissel. Só ook moet insekdoders met mekaar afgewissel word: Piretroïede wat almal aan "IRAC groep 3A" behoort, moet afgewissel word met iets soos indoksakarb wat "IRAC groep 22A" is.

In die geval van swamdoders is die afwisseling nog meer belangrik omdat swamme baie vinniger weerstand opbou as insekte of onkruide. Die strobiluriene is "FRAC groep 11" en behoort afgewissel te word met swamdoders uit 'n ander groep soos byvoorbeeld benomiel "FRAC groep B1".

Maak gebruik van geregistreerde tenk- of formulasiemengsels
Sommige swamdoders is reeds as mengsels in formulasies beskikbaar met die voordeel dat dit weerstandsbestuur vergemaklik. Dit is egter soms nodig om twee verskillende weerstandsgroep swamdoders volgens die etiket se aanbevelings in die spuittenk te meng om hardnekkige swamme uit te wis.

Swamdoders soos die strobiluriene word selde sonder ander swamdoders aanbeveel en word meestal as mengsels in formulasies voorsien. Koperswamdoders is beskikbaar om met iets soos chloortaloniel te meng om weerstand die hoof te bied.

Bly weg van slangspoegmengsels
Dit is ongelukkig standaardpraktyk om tenkmengsels voor te berei waarin daar soms onkruiddoders, swamdoders en selfs insekdoders gemeng word om spuitkoste te bespaar. Sonder twyfel is dit 'n fatale fout, want die chemie is meestal onversoenbaar met een of meer van die aktiewe bestanddele wat in die slag sal bly en die teikens oneffektief sal beheer. Enigiemand wat vir 'n produsent só 'n mengsel aanbeveel, is 'n agent van weerstandsontwikkeling en behoort glad nie eers plaagdoders te voorsien nie.

Weerstandkomitees
CropLife SA se weerstandkomitees, naamlik die IRAC (insekdoderweerstandskomitee), HRAC (onkruiddoderweerstandskomitee) en FRAC (swamdoderweerstandskomitee) is gedurig besig om moontlike weerstand teen plaagdoders te ondersoek en werkbare planne teen weerstand te smee.

As produsente vermoed daar is weerstand van peste, onkruide of swamme teen plaagdoders, moet hulle dit by CropLife SA aanmeld by info@croplife.co.za.

Huidige probleme met weerstand in die graanbedryf

Daar is tans 'n paar ernstige uitdagings in die graanbedryf met insekte en onkruide wat weerstand teen plaagdoders het.

Herfskommandowurm

Die nou alreeds bekende Spodoptera frugiperda het Suid-Afrikaanse mielieprodusente groot skrik op die lyf gejaag toe dit in 2016 kop uitgesteek het. Hierdie uitheemse indringer is totaal weerstandig teen piretroïede en organofosfate. Gelukkig is daar blitsig ander aktiewe bestanddele soos indoksakarb, emamektienbensoaat, chloorantraniliprool, spinetoram en verskeie ander geregistreer om die wurm te beheer.

Dit is egter belangrik dat selfs dié middels afgewissel moet word ten einde die swaard oor die wurm se kop te hou.

Palmer amarant

Die onkruid Amaranthus palmeri het skielik in 2017 sy verskyning in die Noord-Kaap gemaak en is totaal weerstandig teen glifosaat en waarskynlik teen ses ander groepe onkruiddoders. Dit is skrikwekkend dat 'n onkruid glad nie op glifosaat reageer nie en dit hou 'n ernstige bedreiging vir alle mielieprodusente in.

Daar is riglyne vir die uitwissing van die onkruid op www.croplife.co.za onder *Resources* by *Guidelines for Pest Management.*

Plaagdoders alleen is nie die antwoord nie

Landbou moet nog die ernstige kopskuif na geïntegreerde plaagbeheer maak. Dit beteken dat biologiese beheer, bewerkingspraktyke, meganiese beheer en kultivarseleksie stadig maar seker ingewerk moet word in die totale produksieplan. Daar is deesdae baie biologiese middels soos Bacillus thuringiensis en Beauveria bassiana wat komplementêr tot chemiese plaagdoders is en weerstand te bowe kan kom.

Bewerkingspraktyke soos om dan en wan ordentlik diep te ploeg ten einde onkruidsaad, insekeiers en -larwes asook patogeenbesmette plantreste diep in die grond in te ploeg, is 'n belangrike bestuursmaatreël, veral in die bewaringsbewerking arena.

Kultivarseleksie is ook belangrik soos om kultivars te plant wat insekdodergene bevat in plaas daarvan om groot volumes insekdoders toe te dien. Produsente moet bedag wees op plaagdoderweerstand, maar hulle moet ook die ander gereedskap om peste, siektes en onkruide die hoof te bied, gebruik.

Besoek www.croplife.co.za vir meer inligting oor hoe om plaagdoderweerstand te bekamp.

A Look at Integrated Pest Management

Rod Bell
SA Grain
September 2019

Pest management is only one aspect of overall crop production that needs to be considered by a grower. It cannot be considered on its own – overall management of the crop by the grower affects pest management, and vice versa. The first requirement of integrated pest management is to grow a healthy crop, which is more able to withstand the effects of pests than a weak crop or one under stress. A healthy crop also has a higher yield potential and is more able to repay any costs of pest management activities.

Potential of a crop

The genetic makeup of the seed or propagation material used by the grower, together with crop management practices utilised on the crop, determine the potential of a crop to produce a high yield. Pest management, good or bad, does not affect this potential – it can only protect what the crop produces. Therefore, the primary objective of crop production, and the foundation of integrated pest management, is to use good seed or propagation material and good crop management practices to grow a healthy crop with maximum yield potential.

Such a healthy crop as described above is also more able to withstand pest attacks and damage before yield loss occurs. Pest management to prevent or reduce yield loss is coordinated with these practices to obtain economic protection of the crop from pest injury or loss, while minimising hazards to human health, other crops, animals and the environment.

What is integrated pest management?

So how is integrated pest management defined? The global agrochemical industry and the UN's Food and Agriculture Organisation (FAO) have adopted the following definition of integrated pest management: An approach to agricultural production that means the careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep pesticides and other interventions to levels that are economically justified and reduce or minimise risks to human health and the environment. Integrated pest management emphasises the growth of a healthy crop with the least possible disruption to agro-ecosystems and it encourages natural pest control mechanisms.

In simpler words: Integrated pest management uses all available pest management techniques in an overall crop or pest management programme which considers all the potential pests that may impact the crop during its growth and production. Pesticides are applied only when absolutely necessary, and an important part of integrated pest management is determining when pesticides are actually needed.

Key concepts

The key underlying concepts of integrated pest management:

- It is producer based.
- It is not a 'package', but is location-specific (even down to the field level or crop growth stage) and it is a combination of all suitable techniques.
- It must be considered as an integral part of crop production together with all other agronomic techniques.

- It considers the economics of pest management.
- It optimises pesticide use and eliminates unnecessary use of pesticide.
- It promotes safe handling and application of pesticides for the protection of health and the environment – as little as possible, as much as necessary.

Integrated pest management uses all suitable techniques or strategies to keep pests below levels that cause unacceptable crop loss. These different strategies are usually placed under the main headings of mechanical, cultural, sanitation, biological and chemical methods of pest management.

The choice of which pest management method to employ will depend on the crop and pest situation, and on the infrastructure under which the crop is produced (open field versus greenhouse), as well as the availability of resources. It is also important to remember that any crop is a dynamic system – it is constantly changing.

It is changing within a season due to the natural growth stages of the crop, as a result of the producer's management practices (thinning, weeding, fertiliser application, irrigation etc.) and as a result of changes in pest types and numbers. It also changes between seasons as one year may be generally hotter or cooler than another, or one year may have more rainfall than another. The implementation of pest management needs to take this dynamic situation into account.

In summary

Integrated pest management is not a fixed package of recommendations for any crop. It is rather a combination of all appropriate practices into a single plan for crop and pest management that optimises the use of inputs to reduce pests and crop damage to an acceptable level and to maximise crop yields.

The advantages of using integrated pest management are the following:

- The use of inputs is optimised.
- Unnecessary pesticide use is avoided, resulting in reduced costs.
- Crop losses are reduced.
- The development of pests resistant to pesticides is avoided.
- Crop production is sustainable and biodiversity is maintained.
- The risk of human, animal, food, wildlife and environmental contamination is reduced.

Remember

Pest management does not increase the potential of a crop to produce a high yield – it only protects the crop against yield losses.

All our articles are available on www.croplife.co.za in the "How we do it" section (media).
If you would like an English version of an article that was published in Afrikaans, please contact elriza@croplife.co.za

What is your Responsibility?

Dr Gerhard Verdoorn
SA Grain
September 2019

There are certain responsibilities in terms of acquisition, sales, marketing, advertising, promotion, recommendation and use of agricultural remedies.

The following persons (natural or legal as in a company) have certain responsibilities in terms of agricultural remedies:

- The registration holder (this is mostly a company).
- The distributor (this is mostly a company).
- The agent (who mostly works for a distribution company).
- The consultant (who mostly works as a sole operator).
- The retailer (who is mostly a company and in the case of the agricultural sector, is a distributor).
- The retailer's staff (who in the case of the agricultural sector, is an agent).
- The pest control operator (who may be an aerial applicator or otherwise a normal pest control operator).
- The person buying and applying the agricultural remedy (who can be a producer, gardener, homeowner or any other individual applying his or her own agricultural remedies not as a commercial venture).

Duties, responsibilities and liabilities

Duties, responsibilities and liabilities of the registration holder according to Act No. 36 of 1947:

- The registration holder must ensure that its product:
  - Is registered, irrespective of whether the agricultural remedy is marketed as a synthetic, organic or natural product.
  - Is of the chemical and physical properties as approved for its registration.
  - Is effective as claimed in the registration application.
  - Is packaged in the approved container that doesn't leak and in the prescribed volume.
  - Is supplied with the approved and original label.
  - Does not exceed the local maximum residue limit if applied according to label instructions.
- The registration holder cannot be held accountable for the failure of a product, crop damage, human impact or environmental impact caused by the product if it was not applied strictly according to label instructions. This is due to the fact that the registration holder has no control over the application of the product unless it is done by one of their own staff (which is unlikely to happen).
- The registration holder can be held accountable for crop damage or poor performance if certified chemical analysis proves that the product is not of the chemical and physical properties as claimed on the registration thereof.

Distributor's responsibilities

Duties, responsibilities and liabilities of the distributor according to Act No. 36 of 1947:

- The distributor must at all times:
  - Only distribute registered agricultural remedies.
  - Only distribute registered agricultural remedies that are properly packaged and properly labelled by the registration holder.
  - Only distribute agricultural remedies for those purposes and to be applied as in the manner as instructed on the labels of the respective products (this is a compliance requirement in terms of Regulation No. R1716 of 26 July 1991 of Act No. 36 of 1947).

  - o Be licensed to sell Group I agricultural remedies under the Hazardous Substances Act (Act No. 15 of 1973).
  - o Keep strict records of the sale of Group I agricultural remedies in a poison register.
  - o Only recommend the use of agricultural remedies for those purposes and in those manners as instructed by their labels.
- The distributor cannot be held accountable for the failure of a product, crop damage, human impact or environmental impact caused by the product if it was not applied strictly according to label instructions and advice that was offered in full compliance with label instructions. This is due to the fact that the distributor has no control over the application of the product unless it is done by one of their own staff (which is unlikely to happen unless those staff members are registered pest control operators).
- The distributor can be co-accountable with the person who applied the product for the failure of such product, crop damage, human impact or environmental impact caused by the product if it was not applied strictly according to label instructions and if the distributor issued written instructions or offered verbal advice that contradicts the label instructions.

Take note that any action, whether written, verbal or inferred, to draw attention to the use of a product, is regarded as advertising and advertising is regarded as selling in terms of Act No. 36 of 1947. Any advice (advertising sensu stricto) must therefore be only according to label instructions.

Agent's or sales personnel's responsibilities

Duties, responsibilities and liabilities of the agent or sales personnel:

- Only sell registered agricultural remedies.
- Only sell registered agricultural remedies that are properly packaged in original packaging and labelled by the registration holder.
- Only make recommendations for the use of an agricultural remedy (including giving advice for use) according to its label instructions – this includes the purpose for which the remedy is intended and the application method that is intended.
- Only sell an agricultural remedy according to the label instructions – this includes the purpose for which the remedy is intended and the application method that is intended.
- The agent or salesperson cannot be held accountable for the failure of a product, crop damage, human impact or environmental impact caused by the product if it was not applied strictly according to label instructions and advice that was offered in full compliance with label instructions. This is due to the fact that the agent has no control over the application of the product unless it is applied by him.

Consultant's responsibilities

Duties and responsibilities of the consultant:

- May only recommend the use of registered agricultural remedies.
- May only recommend the use of agricultural remedies according to their label instructions.
- The consultant is co-accountable for the failure of a product, crop damage, impacts on human health, livestock and the environment along with the person who applied an agricultural remedy contrary to label instructions, if the consultant advised the client to do so or sold an agricultural remedy to this effect.

Pest control operator's responsibilities

Duties, responsibilities and liabilities of the pest control operator:

- Must be registered as a pest control operator in terms of Section 7 (2) of Act No. 36 of 1947 in order to offer pest control services in the course of business to another person or business.
- Note that a farm worker who applies agricultural remedies on the farm is not a pest control operator and does not have to be registered as such. A person offering pest control to a producer and who is not employed by a producer is a pest control operator and must be registered as such.
- May only provide pest control services for the field in which he or she has been registered.
- May only apply registered agricultural remedies according to their label instructions. Aerial applicators must abide by the SANS 10118 standard in terms of aerial application of pesticides.
- Must provide the client with an invoice stating the trade name of the agricultural remedy to be applied, the active ingredient of such remedy, the dosage rate of the remedy, the purpose for which it will be applied and any particular safety precautions.
- Must provide clients with safety warnings and precautions before pesticides are applied in situations where people may be exposed to it.
- The pest control operator can be held liable if damage to human health, crops, livestock or the environment is incurred due to wrongful (off-label) application of pesticides. In the case of aerial application, both the client and the aerial applicator are accountable for damage to human health, crops, livestock and the environment if pesticides were applied contrary to their label instructions.

Buyer's responsibilities

Duties and responsibilities of the person who buys and applies his or her own agricultural remedies:

- Only buy and apply registered agricultural remedies.
- Only apply agricultural remedies for those purposes and in those manners as instructed by their labels.
  - o Only use on crops as instructed by the label.
  - o Only use for pests as instructed by the label.
  - o Only use label instructed dosage rates.
  - o Only use label instructed application frequencies and intervals.
  - o Only use label instructed number of applications per growth season.
  - o Only use label instructed tank mixtures.
  - o Adjust pH and water hardness with appropriate additives according to label instructions.
  - o Only apply during label instructed window of application to ensure that the maximum residue limit is not exceeded if the commodity is harvested strictly after the pre-harvest interval (PHI).
  - o Should there be a zero level maximum residue limit for a particular active ingredient in export destinations, such an active ingredient should not be applied at all.
  - o Only harvest the commodity after the pre-harvest interval.
- Store agricultural remedies in a secure place with adequate light, ventilation, fire protection and access control.
- Ensure that all workers handling, mixing and applying pesticides wear appropriate protective clothing as instructed by label warnings, precautions and pictograms.
- Participate in the CropLife South Africa empty plastic pesticide container management programme (see www.croplife.co.za under Waste Management).

- Keep proper records of agricultural remedies, use the first-in-first out principle and do not accumulate stock.
- The producer or end user of an agricultural remedy must ensure that an agent or distributor who recommends and sells agricultural remedies does so only according to label instructions.
- Should a producer or end user use an agricultural remedy for any purpose or in any manner other than what the label instructs, that person is liable under Act No. 36 of 1947 and should there be any crop damage as a result of such use, the producer or end user has no recourse against the registration holder of such a product.

Contraventions

The most common contraventions of Act No. 36 of 1947:

- Advising the use of agricultural remedies for purposes or in manners other than what they were registered for.
- Selling agricultural remedies for purposes or in manners other than what they were registered for.
- Using agricultural remedies for purposes or in manners other than what they were registered for.
- Importing unregistered agricultural remedies.
- Selling unregistered agricultural remedies.
- Selling agricultural remedies after decanting it into unlabelled containers.
- Applying agricultural remedies by aerial application if they are not registered for such application.
- Selling Group I agricultural remedies when not licensed to do so.

If you are unsure of a particular product registration or application, visit www.agri-intel.com to access CropLife South Africa's agricultural remedies database of crop protection products registered for use in South Africa, as well as the labels of all the trade names available in the database.

The most important message in this article is: Apply agricultural remedies strictly according to label instructions.

New President and CEO at CropLife International

Published in Heads Up September 2019

CropLife International has appointed a new President and CEO to replace Howard Minigh who is stepping down after successfully leading the organization for more than a decade. He will be replaced by Giulia Di Tommaso, who brings extensive experience in global executive roles.

Liam Condon, Chairman of the CropLife International Board of Directors and President of the Crop Science Division at Bayer, has thanked Minigh for his successful tenure and welcomed Di Tommaso into the organization. Minigh will assist the Board and his successor for a smooth transition.

For more information, please contact Will.Surman@croplife.org

IPCC Releases Climate Change Report

Published in
Heads Up
September 2019

In early August, the Intergovernmental Panel on Climate Change (IPCC) released a report on Climate Change and Land, tackling the question of how to feed a growing population without further damaging our planet. Although it received significant press coverage, with suggestions that food production systems need to change, the report looks at agriculture as a whole and does not single out plant biotechnology or crop protection.

CropLife network members who received press queries about the report were advised to showcase how plant biotechnology and crop protection technologies are helping farmers increase yields, reduce the need to cultivate more land, and adapt to climate change. For more information, please contact Gloria.Jaconelli@croplife.org

Feedback: MRLs, Consumer Safety and Trade in Africa Agricultural Produce Workshop

Published in
CropLife Africa Middle
East Newsletter
July 2019

The Maximum Residue Limits (MRLs), Consumer Safety and Trade n Africa's Agricultural Produce workshop was held in Johannesburg on 4 and 5 June 2019 bringing together over 50 participants from 10 countries representing regulators, Ministries of Trade, Agriculture and Health officials, grower groups and Regional Economic Communities, among others.

The workshop provided a platform for participants, who shared experiences on the current application of MRLs by countries, acquainted themselves with changes in the regulatory and policy environment around MRLs and Import Tolerance (ITs) setting and their potential impacts and shared best practices, strategies for development and implementation of effective MRLs and ITs. In their own words, they shared their expectations, summarized around the need to advance strategies for:

- Exchanging country experiences and knowledge in management of MRLs
- Enhancing capacity building in risk assessment and bringing science back into the MRL discussions
- Harmonising Africa's position in MRL discussions at international fora (e.g. Codex, CCPR, JMPR and SPS including setting of MRLs within Africa
- Harmonising regulations for registration of pesticides
- Addressing growers' challenges including those related to minor and speciality crops
- Creating an enabling environment for sustainable production and market access

Topics handled during plenary and panel discussions highlighted the centrality of risk assessment and a description of tests such as NOAEL (No Observed Adverse Effect Level, which is, a determination of the highest exposure level at which no adverse effects can be identified for different test species and a derivation of further toxicological reference values like acceptable daily intake –ADI and acute reference dose – ARfD to assess consumer safety.

In addition, MRL setting processes in South Africa, Uganda, Kenya, Zambia, Ethiopia and Ivory Coast were discussed, representing a majority of countries within the Africa Middle East region that defer to Codex or comply to those of respective exports destinations. From these experiences and others, participants underscored the benefits of having MRLs in place including; equal playing field for market access and consistency in food quality and safety. Other public sector experiences were presented highlighting the US EPA food safety monitoring program, Egypt's laboratory experiences in residue analysis and the EAC's harmonisation of guidelines for pesticides residue trials.

MRL setting process in most African countries follows the automatic adoption of Codex MRLs. In economies that do not use positive list approach, Codex MRLs or in some cases exporting country MRLs are often used.

An estimate of the amount of a specific substance in food or drinking water, that can be ingested daily over a lifetime without appreciable health risk.

South Africa is the only country in Africa that sets its own MRLs, also defers to CODEX.

Feedback: CropLife Africa Middle East Container Management Workshop in RSA

Les Hillowitz
CropLife Africa Middle East Newsletter
July 2019

In line with our strategy to develop container management programs in key countries in the region and by so doing provide the necessary guidance and support, a container management workshop was arranged in South Africa for 11 African countries.

The workshop, under the theme "Build and Strengthen Container Management Programs in the Africa, Middle East Region" took place in Stellenbosch on 24 – 26 June.

Delegates witnessed first-hand the success of the South African operation in which approximately 70% of all plastic containers placed on the market are collected and recycled. They were able to visit a "collection centre" in the Ceres area and 3 recycling plants situated just outside of Cape Town.

All countries came prepared with an action plan, either with firm plans to introduce a pilot project, or, in several cases, how they planned to grow their collections. For 2018, the region only had 8 pilot programs with collections growing by approximately 10% over the 2017 volumes and exceeded our goals, in that more than 5.6 million kg plastics were collected during the year and more than 5.3 million kg plastics, recycled. This is approximately 19% of all the plastic pesticide containers placed in the African market.

The workshop included presentations by both GLOBALG.A.P. and WWF which were interactive and highly supportive of our endeavours. Samira Amellal, DG of CropLife Africa Middle East, undertook the opening address as well as the closing remarks.

Remember to Make Use of our Services

Members are encouraged to participate in, and make use of the services that CropLife SA has to offer:

Ideal dossier checklists	Advertisement compliance verification	Guidelines for regulatory compliance
Waste management programmes	Agricultural remedies databases	Stewardship best practices

Participation in forums addressing key issues such as:

Pollinator health	Resistance management	Regulatory affairs
Stewardship	Application technology	Seed treatment

We're Here to Help

If you require assistance with any of the above services, 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 or visit our offices in Centurion:

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 and Membership 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	lsteyn@viking.co.za
Susan Ramaila	Office Assistant	+27 (0)76 063 6629	susan@croplife.co.za

310 Lougardia Building
Corner of Hendrik Verwoerd drive & Embankment road
Centurion, Gauteng
South Africa