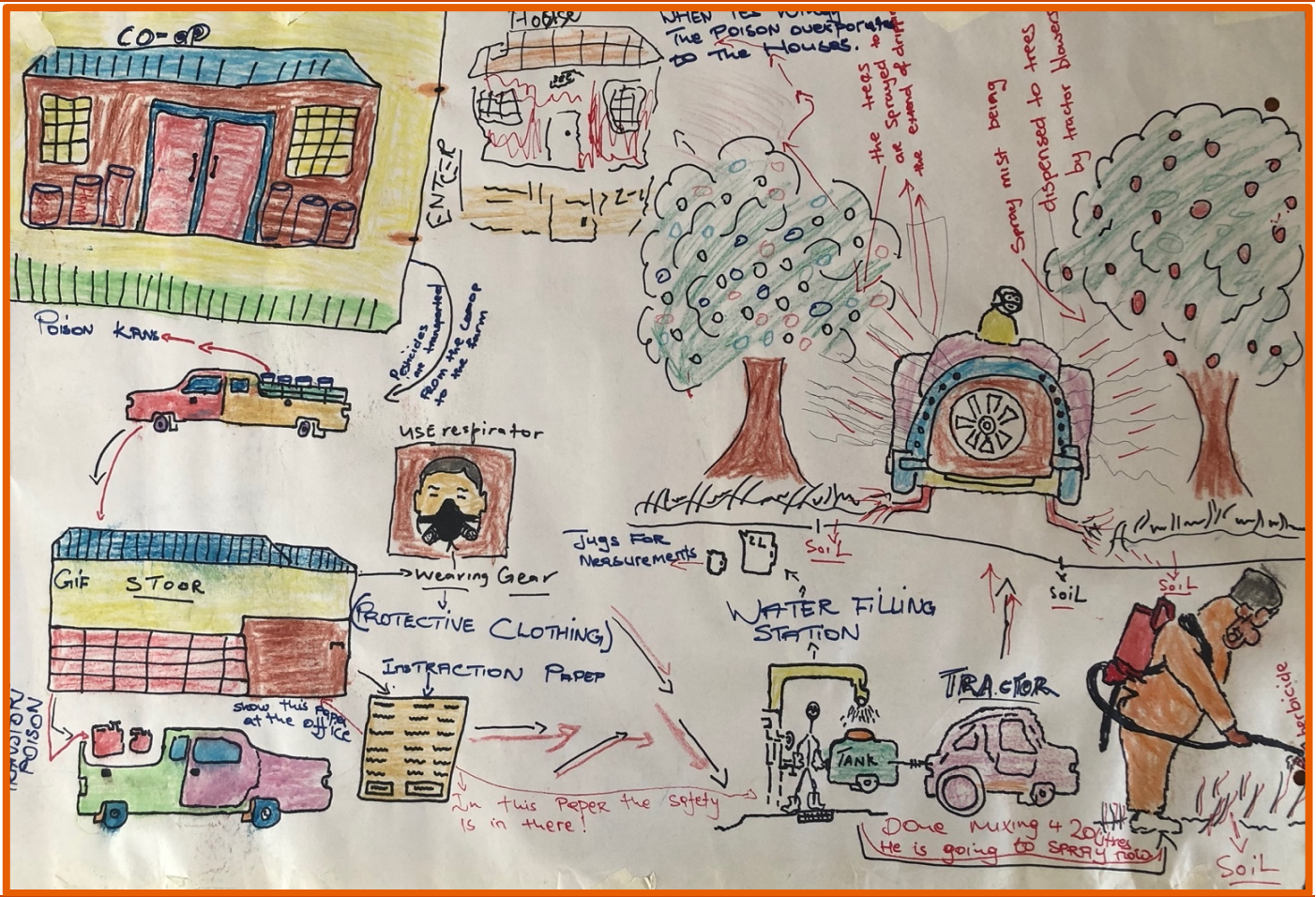

# Farmworkers and Pesticides in the Citrus Industry



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# Table of Contents

## Overview

Little is being done to protect farmworkers from regular exposure to high levels of toxic pesticides in the fields and warehouses where they work in South Africa.

The harsh working conditions of farmworkers and their precarious employment make them vulnerable to pesticide exposure. Employers in the Sundays River estimate that around 41 000 workers may be employed at the height of the season. Women seasonal workers constitute a large section of the labour force in the orchards and packhouses.

Farmworkers do not have special facilities at the workplace to wash off pesticide residue on their bodies and clothing. It is commonplace that there are 'take home' exposures to farmworkers' families.

Workers frequently suffer from chest and nasal problems, skin and eye irritations, headaches, nausea, and diarrhea. These are symptoms that can result from pesticide exposure.

Studies have documented higher risks of chronic diseases linked to pesticides within farming communities, including cancer, birth defects and learning disabilities.

More than often, it is migrant workers and female seasonal workers who are particularly vulnerable to pesticide exposure soon after its application.

South Africa faces an increasingly toxic future. Currently, South Africa has more than 9000 different herbicide, insecticide and fungicide products registered for use, a dramatic increase from the 3000 pesticide products registered in 2010. They are made up from 500 active pesticides ingredients manufactured for export, mainly from countries in Europe. A great many of the active ingredients in these pesticides are banned in their country of origin.

This research found 201 pesticide products used on wine and citrus farms. Many of these pesticides have active ingredients that have been banned in the European Union.

Despite the continued growth of the pesticide market, South Africa does not have an adequate pesticide monitoring program in place. This means that systematic ways of assessing the health impact of pesticides on farmworkers, are not in place. Nor are the levels of pesticide residue on foods known. A recent study found the highest levels of pesticide residue on oranges in domestic markets in Pretoria and Johannesburg. The study also found that cross-contamination can occur to others fruits because of alternate crops packed in the same packhouse.

A healthy and safe food system would serve the common interests of farmworkers, farming communities and consumers. Shifting away from reliance on hazardous pesticides — and toward agroecological farming — is a key step toward a pesticide free future.

## Hazardous pesticides in the citrus industry

In 2019, Zoliswa Ntlanjeni, who works on a farm in the Sundays River Valley, told a meeting organised by trade unions with the Department of Labour that her friend's husband died as a result of having his shoulder severed by a machine while he was spraying pesticides. His family did not receive compensation and her friend was evicted from the house were she was staying with her husband.

While we don't have a clear picture of the extent of pesticide poisonings, the lack of protective clothing (especially for migrant and seasonal workers) are an indication of huge health problems on citrus farms. Research by the Rosa Luxemburg Foundation found that on the EU certified export farms of Nuwelande, Hillside and Panzi, only permanent workers are issued with protective clothing.

On the Nuwelande farm for example, workers indicated that the spraying of pesticides takes place in close proximity of migrant workers. Workers have complained about headaches, itchy throats, faces, and arms, while one worker at Hillside citrus farm had acute lung poisoning. Insecticides banned in the EU such as chlorpyrifos (19 products), chlorfenapyr (5 products) and hydramethylnon (11 products) are used on the citrus farms in the Sundays and Kouga municipal area.


*Map of Nuwelande drawn by farmworkers in February 2020 show routes of pesticide contamination through air drift from orchards to homes, the Gamtoos river, farmworkers' drinking water in the dam and onto their vegetable gardens near their homes.*

Khanyisa's research on pesticides indicate that farms within the Sundays River Valley and Kouga Municipality in the Eastern Cape use pesticide active ingredients which are either banned or highly restricted in the European Union. All the farms (below) use their own specific combination of highly toxic pesticides (herbicides, insecticides and fungicides) in citrus production. A recent study by the Valencian (Spanish) farmers' association, also warned that more than 50 active substances used in plant protection products banned in the European Union, are being used in citrus fruit production in South Africa.

| Farm | Name of Pesticide | Company | Type of Pesticide | Active ingredient |
|---|---|---|---|---|
| Hillside | SCAT 360 SL | Villa | herbicide | Glyphosate |
| Quacha | SCAT 360 SL | Villa | herbicide | Glyphosate |
| Sunriver | SCAT 360 SL | Villa | herbicide | Glyphosate |
| Oranjelus | Roundup Turbo | Monsanto | herbicide | Glyphosate |
| Sunriver | Gramoxone | Syngenta | herbicide | Paraquat |
| Quacha | Pyrinex 480 EC | Adama SA | insecticide | Chlorpyrifos |
| Sunriver | Pyrinex 480 EC | Adama SA | insecticide | Chlorpyrifos |
| Nomzamo | Chlorpyrifos | ArystaLifeScience | insecticide | Chlorpyrifos |
| Oranjelus | Chlorpyrifos | ArystaLifeScience | insecticide | Chlorpyrifos |
| Quacha | Chlorpyrifos | ArystaLifeScience | insecticide | Chlorpyrifos |
| Sunriver | Chlorpyrifos | ArystaLifeScience | insecticide | Chlorpyrifos |
| Quacha | Siege | BASF | insecticide | Hydramethylnon |
| Hillside | Hunter | BASF | insecticide | Chlorfenapyr (pyrrole) |
| Quacha | Hunter | BASF | insecticide | Chlorfenapyr (pyrrole) |
| Sunriver | Hunter | BASF | insecticide | Chlorfenapyr (pyrrole) |
| Hillside | Dithane M-45 | Southern-Ag | fungicide | Mancozeb |
| Oranjelus | Dithane M-46 | Southern-Ag | fungicide | Mancozeb |
| Quacha | Dithane M-47 | Southern-Ag | fungicide | Mancozeb |
| Sunriver | Dithane M-48 | Southern-Ag | fungicide | Mancozeb |

Glyphosate, the herbicide which has either been banned, is being phased out, or is highly restricted globally, is found in 79 products produced and sold in South Africa. Glyphosate is associated with cancer according to the International Agency for Research on Cancer and the Cancer Association of South Africa. A meta-analysis published in 2019 states that there is a compelling link between non-Hodgkins lymphoma (a cancer) and glyphosate. This toxin is widely used on citrus producing farms. While CANSA advocates a restricted use of glyphosate, it has not questioned how the maximum residue levels (MRL) are set and by whom they are set. It was Monsanto and a consortium of European chemical companies that performed the risk assessment for the re-approval of glyphosate which then was used by the European Food Safety Authority (EFSA).

Paraquat, a highly toxic herbicide, is found in 25 products produced and sold in South Africa. Paraquat is now banned in over 40 countries, including in the European Union and Switzerland because of its adverse health effects. Paraquat is 28 times more acutely toxic than glyphosate. Acute poisoning may occur through contact with skin, eyes, or via inhalation. There is now evidence that chronic exposure to paraquat is linked to: harmful effects on the respiratory system, reproductive problems, and increased risk for Parkinson's disease. On the Sunriver farm, farmworkers are exposed to this toxic substance which is used throughout the year, during handling and mixing, spraying and working in recently sprayed fields. Families are exposed when washing protective clothing.

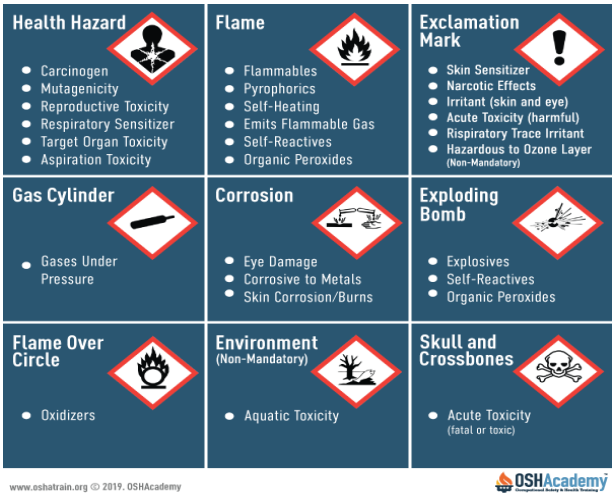

*Protest by Malasian plantation workers against paraquat. Workers and their organisations want Syngenta in Switzerland to stop producing paraquat and exporting it to developing countries.*
*Available from: https://www.publiceye.ch/fr/news/detail/ non-a-un-herbicide-dangereux*

Chlorpyrifos has been used by farmers to kill pests on a wide variety of crops including cabbage, broccoli, wine grapes and citrus. It is also a popular compound used to control and eliminate fleas, insects, termites, pests and mosquitoes. In South Africa, the use of Chlorpyrifos was banned in 2010 for residential use but it is still allowed to be used for pest control in the agricultural sector. The compound is associated with health problems, such as neurological impacts (brain damage) in children and respiratory problems.


*Farmworkers protest in California against the use of chlorpyrifos. The California Department of Pesticide Regulation has concluded that young children in California risk permanent neurotoxic effects from exposure to unsafe levels of chlorpyrifos in their food, water and air. Available from: http://www.panna.org/press-release/calls-intensify-california-regulators-take-action-chlorpyrifos*

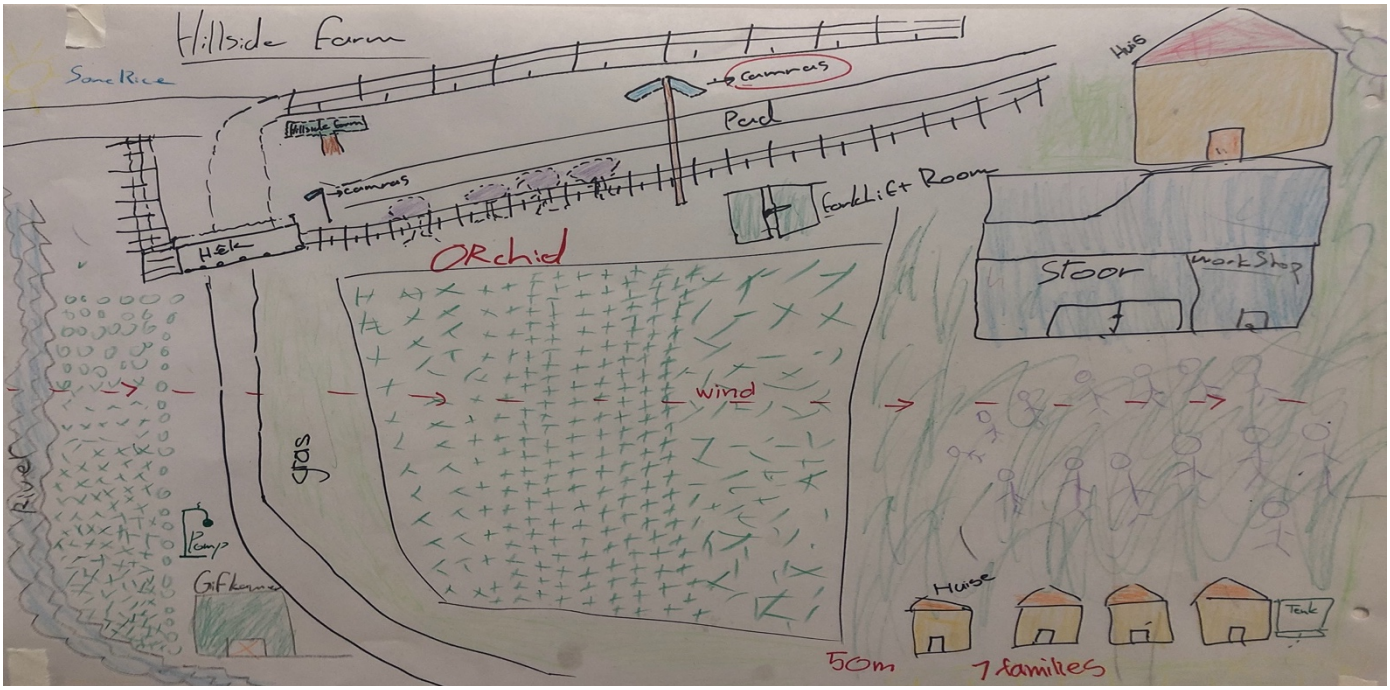
Chlorfenapyr has not been studied extensively, but its toxicity to humans is very high. In case of inhalation, skin and eye contact, chlorfenapyr may cause mild irritation, tearing, nausea, and headache, irritation to mucous membranes and respiratory tract and breathing difficulty. The persistence hazard for chlorfenapyr in any environment is considered high, because it is likely to take over a year for it to degrade to half of the application concentration. Chlorfenapyr is moderately toxic to worms and highly toxic to birds, bees, fish and other aquatic organisms. Bee mortality as a result of exposure to pesticides is relatively common in South Africa. As recent as 2018, millions of nature's chief pollinators were wiped out in Cape Town's wine farms due to the incorrect use of pesticides.

Mancozeb is a fungicide that has been associated with different possible health effects by many scientists. In 2020, the European Food Safety Authority (EFSA) concluded that mancozeb did not meet the approval criteria due to reproductive toxicity and endocrine disruption. It also found a high risk to birds, mammals, bees and other insects and to soil organisms.

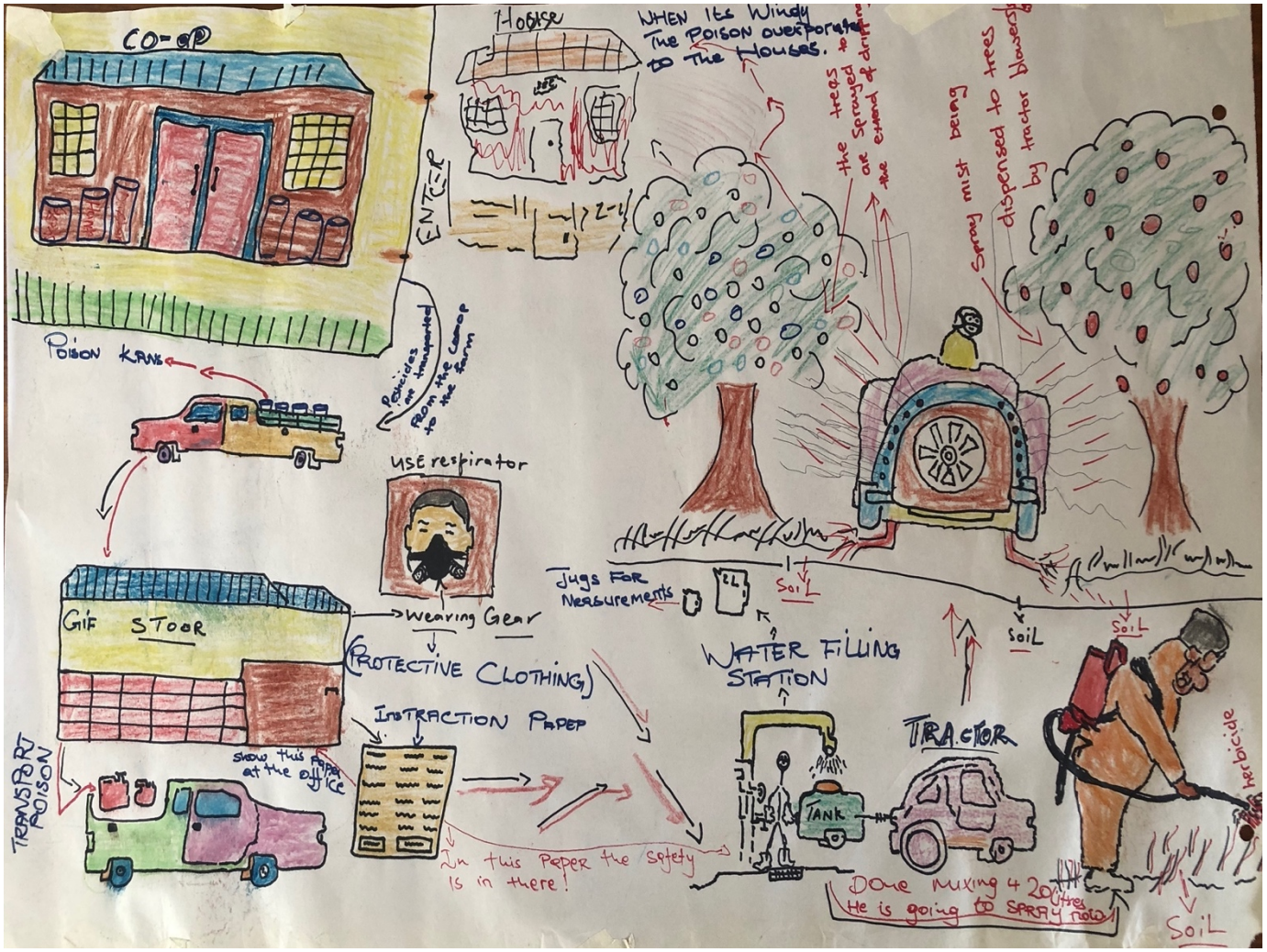



*The organisation,'Women on Farms', protests the use of harmful pesticides outside Parliament in 2019. The women want a ban 67 pesticides tthat are already banned in the European Union, to protect the health of farmworkers. They also want farmers to be held accountable if they disobey labour laws.*
*Available from: https://www.groundup.org.za/article/farmworkers-want-67-pesticides-banned/*

In addition to being exposed to harmful pesticides, the Women on Farms study of 2019 report that while three quarters of farmworkers are exposed the pesticides, only 27% were informed about the health hazards posed and 66% of workers indicated that they did not receive protective clothing.




*Map of Hillside Farm drawn by farmworkers in February 2020 show routes of pesticide contamination through air drift from orchards to homes, farmworkers' drinking water which is gathered from rooftops into a tank and onto children's playing fields near the orchard*




*Map drawn in February 2020, showing the different points of contact by farmworkers with pesticides and possible pesticide contamination of farmworkers and the environment.*


*Map drawn in February 2020, showing how pesticides can enter the household and cause exposure over the long term through the washing of clothes and using washing waste water on the vegetable garden.*

## Government and the industry lobby

The Department of Agriculture, Land Reform and Rural Development (DALRRD) previously known as the Department of Agriculture, Forestry and Fisheries regulates the manufacture, distribution, sales, use and advertisement of pesticides.

The 'maximum residue level' (MRL) is determined by the department which conducts evidence-based scientific evaluation and approval of the pesticides. The recommended MRLs for the various pesticides is then sent to the Department of Health which determines the level of the health hazard posed. Approved levels for use in South Africa is published by the Department of Health under the Foodstuffs, Cosmetics and Disinfectants Act. At the moment, South Africa's laboratories in Pretoria and Stellenbosch serving to check compliance with MRLs are dedicated exclusively to the export industry.

Of importance is that MRLs for local production of fresh produce and wine may be set at a different levels from that of the countries to which we export. For example, there are different MRLs for glyphosate in the US, EU and South Africa.

While local and international regulatory authorities set MRL values for pesticide residues in or on food products, this is not set without industry interference. DAFF has effectively outsourced the database on pesticides that contains crop information, safety data sheets (SDS) and information on maximum residue limits (MRL) to Croplife South Africa, an organisation that represents industry. Members of the public has to register and pay to access the database. It is a huge concern that South Africa is highly dependent on the private sector to monitor and self-regulate pesticide use.

**The Precautionary Principle**

**When an activity raises threats of harm to human health or the environment, precautionary measures should be taken to prevent harm, even if some cause and effect relationships are not fully established scientifically.**

In other words, it is the responsibility of industry to prove that its products are safe and not the responsibility of the public to prove that they are unsafe. There is now enough global evidence on the dire consequence in the use of glyphosate-based herbicides on the health of humans and animals, water quality and the broader environment. The South African government has a duty to immediately invoke the precautionary principle to ensure that we play our part in stopping the cancer pandemic and environmental destruction.


*In Europe there is a strong campaign to ban Glyphosate-based herbicides. Available from: https://www.dw.com/en/eu-lawmakers-vote-to-ban-glyphosate-weed-killer-by-2022/:~:text=The%20European%20Parliament%20has%20called%20for%20glyphosate%20to,its%20license%20should%20be%20renewed%20for%2010%20years.*

## The use of hazardous pesticides on citrus and grape farms

In our research we have found 201 products (herbicides, insecticides or fungicides) with active ingredients that are either banned or have a restricted use within the European Union.

The pesticide list below gives active ingredients that are banned for direct agricultural, industrial, municipal or domestic use in the European Union, but which are still used in South Africa.

| Pesticide (active ingrediant) | EU approval status | Health & Environmental Risk | Symtoms |
|---|---|---|---|
| azinphos-methyl (insecticide) | Not approved | Highly toxic to mammals. It is a neurotoxicant (alters the nevous system). It is highly toxic to birds, honeybees and most aquatic life. It is moderately toxic to earthworms. | Shown to trigger headache, seizures and loss of consciousness. Also causes muscle twitching, general weakness, tremor and reduced muscle coordination. Moreover, direct contact with the harmful compound is associated with the onset of severe skin irritation and serious eye conditions such as blurred vision and pinpoint pupils. |
| carbendazim (fungicide) | Not approved | Regarded as a reproduction and developmental toxicant. Carbendazim poisoning may adversely affect the liver, kidneys, and spleen. Highly toxic to earthworms, while moderately toxic to honeybees and most aquatic organisms. | The product may cause skin and eye irritation. May cause dizziness, nausea, salivation, laboured breathing and exhaustion when swallowed. |
| Chlorfenapyr (insecticide) | Not approved | High human oral toxicity. Highly toxic to birds, fish and aquatic invertebrates. Highly toxic to bees. | No specific symptoms of poisoning are known |
| Carbofuran (insecticide) | Not approved | Highly toxic to humans. May cause damage to organs through prolonged or repeated exposure. Death may result at high doses from respiratory system failure associated with carbofuran exposure. It is highly toxic to birds and honeybees whilst having a moderate to high toxicity to most aquatic organisms. It is moderately toxic to earthworms. | Blurred vision, Vomiting, Diarrhea, Breathing difficulty, Headache, Lassitude (weakness, exhaustion), Muscle twitching, Incoordination, Convulsions, Increased blood pressure, Incontinence, Abdominal cramps and Sweating |
| Chlorpyrifos (insecticide) | Not approved | Possible genotoxicity (which may lead to cancer) and developmental neurotoxicity (damage to central nervous system). Is detrimental to honeybees, arthropods, and earthworms. | Blurred vision, Vomiting, Diarrhea, Headache, Dizziness, Respiratory depression, Muscle twitching, Anxiety, Abdominal cramps and Sweating |
| Hydramethylnon (insecticide) | Not approved | Possible Human Carcinogen (causes cancer). Highly toxic to fish. | No specific symptoms of poisoning are known |
| Imazapyr (herbicide) | Not approved | Serious eye irritant. Long term harm to aquatic life and bees. | No specific symptoms of poisoning are known |
| Oxadiazon (herbicide) | Not approved | Likely to be carcinogenic to humans and toxic to bees | No specific symptoms of poisoning are known |
| Paraquat (herbicide) | Not approved | linked to reproductive effects and to Parkinson's disease. | irritation such as in the eyes, skin, and nose; Irritation, burning and distress in the mouth, throat, respiratory and gastrointestinal tract; Pulmonary fibrosis, nosebleeds, Dermatitis, Fingernail damage, Seizures, Shock, Shortness of breath, Vomiting (with or without blood), Heart, liver and kidney damage, death. |
| Propineb (fungicide) | Not approved | Potential endocrine disruptor. In addition, it may also cause birth defects, cancer, and male infertility. Likewise, it may cause overactivity of the thyroid gland or goiter and nerve disorders. It can contaminate the aquatic environment with long lasting effects. | Acute health effects of propineb include muscle weakness, flushing, breathing difficulties, nausea, vomiting, and low blood pressure. Moreover, exposure to high doses may lead to loss of appetite, squinting, excessive production of saliva, watery eyes, labored breathing, reduced body temperature, incoordination, depression, and rapid muscle twitching. If the chemical comes in contact with the eyes, it may result to tearing or redness in the eyes. |
| Pyroxasulfone (herbicide) | Not approved | Harmful if inhaled or absorbed through the skin. Limited evidence of a carcinogenic effect. Toxic to fish and wildlife. Very toxic to certain aquatic organisms | May cause eye or skin irritation |
| Saflufenacil (herbicide) | Not approved | Avoid contact, ingestion and inhalation. May cause sensitization in contact with skin. Toxic to aquatic organisms. | Irritating to eyes and skin |
| Thidiazuron (growth regulator) | Not approved | Suspected of causing cancer. May cause damage to organs through prolonged or repeated exposure. Very toxic to aquatic life with long lasting effects | Irritating to eyes and skin. May cause damage to eyes. May cause respiratory irritation. |
| Thiodicarb (insecticide) | Not approved | Toxic if swallowed, inhaled or absorbed through the skin. Toxic to fish, bees and wildlife. | Miosis, Lacrimation, Respiratory paralysis, Bradycardia, Hypotension, Salivation, Bronchial hypersecretion, Nausea, Vomiting, Diarrhoea, Sweating, Fibrillation, Muscle twitching, Myoclonus, Somnolence, Coma, Respiratory failure, Hypothermia, Convulsions. |
| Triadimenol (fungicide) | Not approved | Poisonous when swallowed, absorbed through the skin or inhaled. Toxic to fish and wild life. | Possible symptoms of human poisoning if product is swallowed are nausea, vomiting, stomach ache and diarrhea. If product comes into contact with the eyes, it can cause irritation leading to redness and tears. |

## The value chain of pesticides production

Croplife (an association of agrichemical producers) members, Syngenta, Bayer Crop Science, BASF, Corteva Agriscience, and FMC are the five biggest pesticide companies in the world by agrochemical turnover. CropLife's sixth member is the Japanese company Sumitomo Chemical, the world's 8th biggest pesticide company. More than 9000 pesticides products are authorized in South Africa.

The agrochemical industry plays a central role in agricultural production which is at the beginning of the value chain. Each step of the production process is tightly controlled by integrating the purchase of seeds, pesticides and fertilizers by major companies like Monsanto.

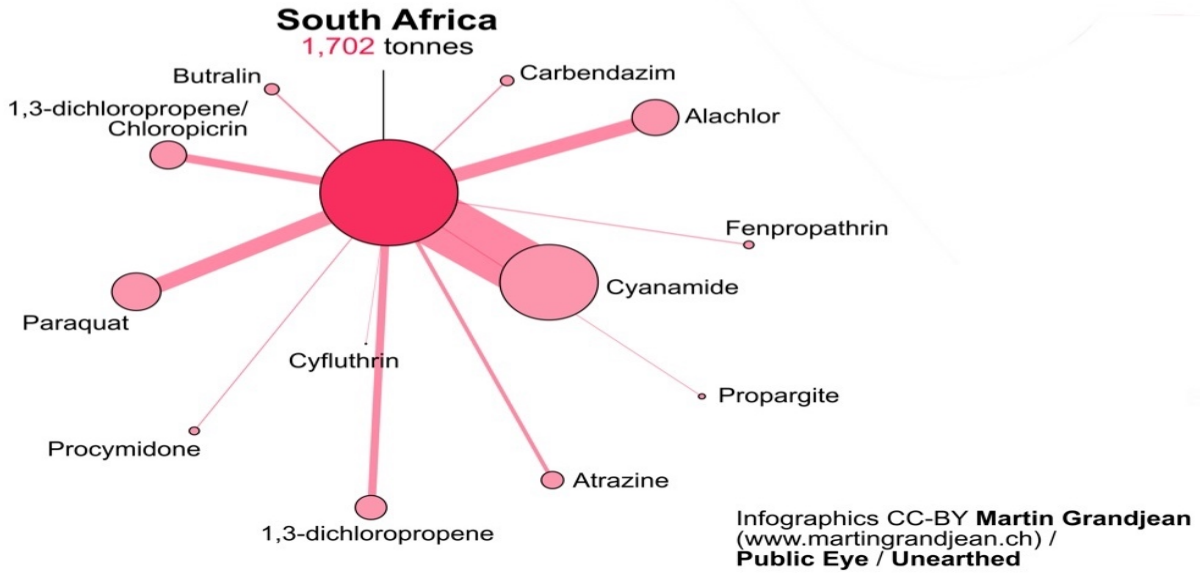
Major players in the pesticide industry in South Africa are

| | |
|---|---|
| AECI Ltd | Kombat (Pty) Ltd |
| Arysta Lifescience South Africa (Pty) Ltd | Monsanto South Africa (Pty) Ltd |
| Ascendis Health Ltd | Oro Agri Sa (Pty) Ltd |
| Basf Agricultural Specialities (Pty) Ltd | Plant Health Products (Pty) Ltd |
| Basf South Africa (Pty) Ltd | River Bioscience (Pty) Ltd |
| Bayer (Pty) Ltd | Scientific Chemicals (Pty) Ltd |
| Dow Agrosciences Southern Africa (Pty) Ltd | Syngenta South Africa (Pty) Ltd |
| Farm-Ag International (Pty) Ltd | Villa Crop Protection (Pty) Ltd |
| Intelichem (Pty) Ltd | |

Most of the pesticides imported into South African come from China, USA, Germany and Belgium. South Africa is at the same time a major exporter of pesticides to the African region. South Africa's share of the African agrochemical market is currently around 35%. Recognising the ecological and health problems posed by pesticides, the European Union made changes to the regulatory regime and imposed more rigorous data requirements, and the application of complex technical guidance procedures for risk assessment, resulting in fewer new active substances being registered in the European Union

While the EU bans the use of hazardous pesticides for use within its own boundaries it uses developing countries as its dumping ground for toxic chemicals.

## Banned EU pesticides notified for export to South Africa



## Towards a pesticide free future

In 1960, the pesticide industry was worth less than $10 billion, and there were around 100 active ingredients available to farmers. Today the industry is valued at over $50bn and there are around 600 active ingredients available to farmers globally. This amounts to a 500% increase in the number of active substances since 1960, and brings enormous environmental consequences.

Pesticides destabilize the complex balance between predator (birds, mice, insects) and prey species (worms, insects) that is the natural occurring pest control system. The extensive use of pesticides also includes the loss of biodiversity and thus an erosion of soil quality, threatening long term food security.

Pesticides also have a severe impact on the enjoyment of human rights which includes the right to work and live in a safe environment, and the right to health.

Agroecology aims to replace chemicals with biological materials found naturally within the environment. In this sense it promotes agricultural practices that is suited to local environments. Such localised practices allow for a biological interaction between different crops and natural pests, and at the same time builds up the long-term fertility of the soil. Agroecology combines traditional knowledge with the findings and methods of modern science. Unlike the agro-industrial model which promotes the growing of crops often unsuited to the local environment and which attracts pests that normally do not occur in such environments. In moving away from pesticide production, agroecology reintroduces crop diversity as an alternative to monoculture - the cultivation of a single crop on vast tracts of land.

## Recommendations

1. The South African government needs to pass a law prohibiting the import of active ingredients and pesticide products that are not approved in the EU or other countries.
2. The South African government must extend the mandate of Product Export Control Board (PPECB) to include local fresh produce in its quality inspection of pesticide residues.
3. The Department of Agriculture, Forestry and Fisheries (DAFF) needs to open for public review the dated Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act No. 36 of 1947 in order to bring it in line with the South African constitution and bill of rights.
4. DAFF, the Department of Health and the National Institute for Occupational Health must establish a comprehensive system to assess, monitor and report on the health of farmworkers on an annual basis.
5. The DAFF needs to set up adequate evaluation and monitoring systems to record the extent of acute and chronic poisonings in South Africa.
6. DAFF should review the registration and approval of glyphosate in South Africa and implement a ban in 2021.
7. DAFF must take responsibility in the provision of information services related to pesticides (active ingredients and maximum residue levels) to farmers.
8. DAFF should convert some of the state farms to experiment with the agroecological model of farming.

## Key terms

The **active ingredient**, usually the only component of the formulation listed on the pesticide label, is by nature biologically and chemically active against a target pest, be it an insect, weed or fungus. By definition these chemicals kill living things.

**Endocrine disruptors**, sometimes also referred to as hormonally active agents, are chemicals that can interfere with endocrine systems. These disruptions can cause cancerous tumors, birth defects, and other developmental disorders

**Fungicide** is any toxic substance that destroys fungi or inhibits their growth.

**Herbicides**, also commonly known as weed killers, are substances used for killing or inhibiting the growth of unwanted plants, such as residential or agricultural weeds and invasive species.

**Maximum residue level** (MRL) is the legal limit for pesticide residues in food for human consumption and animal feeds. Each foodstuff has its own limit

**Pesticide**, is any substance or mixture of substances intended for preventing, destroying, repelling or mitigating any pest. Though often misunderstood to refer only to insecticides, the term pesticide also applies to herbicides, fungicides, and various other substances used to control pests

# NOTES


Farmworkers researching pesticides, February 2020, Gqeberha