

# Pesticide residues and food safety

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**P**esticides are essential in assisting potato producers to combat pests, diseases and weeds. It is almost inconceivable to produce the expected tonnage of potatoes used by South Africans, either fresh or in processed form such as chips, without using pesticides.

Potatoes are an essential nutritional source of carbohydrates, especially for children, and therefore this food source needs to be protected against agricultural pests, diseases and weeds. The pertinent question these days is whether the food we consume daily is riddled with pesticides?

## Levels of concentration in food

The simple answer is that all food contains pesticide residues, but the concentration levels are not necessarily harmful to people's long-term health. Two government entities, the Department of Agriculture, Land Reform and Rural Development and the Department of Health, published a mandate to regulate pesticide residues in food to ensure food that is safe for human and animal consumption. This is done via regulations that determine the maximum residue levels (MRLs) of pesticides for all crops.

The social media 'experts' who vent about pesticide residues in food usually have no inkling of the intense and lengthy studies conducted to determine the safe concentrations of pesticide residues in food crops.

If the MRL of a well-known pesticide such as chlorantraniliprole in potatoes in South Africa was set at 0.05 mg/kg, the consumer can rest assured that that concentration poses no risk to human health. The MRL is therefore the highest permissible level of concentration of pesticide residue in or on food. Any food product with a value below the MRL

can be safely consumed by humans and animals.

## Monitoring systems

In South Africa, many establishments such as food processors, fresh produce retailers and food retailers manage their own residue monitoring systems and analyse or have their fresh products analysed regularly for the presence of pesticide residues. The producer might be caught unawares when several potatoes at the processor's plant test positive for excessive pesticide MRL limits.

Following such an analysis, there are several options available to the new owner of the potatoes:

- The new owner may reject all the potatoes and refuse to pay the producer.
- The potatoes can be stored in quarantine to allow the pesticide to metabolise sufficiently or be broken down physically until it is below the maximum MRL concentration.
- The potatoes can simply be disposed of, and compensation can be claimed from the producer.

So where can potato producers obtain information on pesticide residues and their associated MRLs? CropLife SA's Agri-Intel database contains comprehensive information on more than 95% of the registered pesticides in South Africa. Among other things, it contains a subset of data on MRLs that apply to crops such as potatoes.

The database contains a range of MRLs for every pesticide registered for every crop – and this includes import tolerances to foreign destinations. Import tolerances are set by the export destination. The foreign country sets its own MRL which a producer must comply with in order to export the crop to that destination.

Seeing as most potatoes are consumed locally, producers mostly have to focus on the South African data set. The MRL of a pesticide is always accompanied by the pre-harvest interval. This indicates up to which growth phase of the crop a pesticide can be applied before harvesting takes place. This is to prevent the MRL from being exceeded. All the information is available on [www.agri-intel.com](http://www.agri-intel.com).

Producers can also have their potatoes analysed by analytical laboratories. For information about these laboratories, contact CropLife SA by emailing [gerhard@croplife.co.za](mailto:gerhard@croplife.co.za).

## Take the right measures

CropLife SA implores producers to apply pesticides strictly according to the label instructions. These instructions are not mere recommendations; these are legal requirements set by the *Fertilizers, Farm Feeds, Seeds and Remedies Act, 1947 (Act 36 of 1947)*.

Any deviation from the label instructions may affect the producer negatively. In the context of pesticide residues, there is a risk of the active ingredient being exceeded and the producer's potatoes being unmarketable.

Producers should note the following when considering pesticides in their potato production plan:

- Is the pesticide registered for use on potatoes to combat a pest, plant disease or weed? If so, continue to apply it according to the label instructions. If not, steer clear of the product because there is no reason to believe that it can be safely applied to potatoes.
- How frequently must it be applied? In other words, how many times can the pesticide

be applied during a production season? The label instructions might for example indicate that only two applications are allowed per season. If the number of applications is exceeded, there is the risk of resistance developing and exceeding the MRL of the pesticide. Pesticides always have a well-established degradation curve, but it is accompanied by the dose and number of applications per season. If more than the permitted number of applications per season were administered, then the normal degradation curve does not apply because the amount of pesticide on the crop was more than the research on the degradation curve took into account.

- The dosage applied is an important factor in the outcome of residue levels during the harvesting of the crop. Overdosing (administering more than stated on the label instructions) inevitably leads to

higher terminal pesticides residues.

- The pre-harvest interval plays a very important role in terminal pesticide residues – the shorter the pre-harvest interval, the higher the terminal pesticide residues in the crop.
- Tank-mixed pesticide can also play a role in breaking down the pesticide's active ingredient. It is therefore undesirable to simply apply tank-mixed pesticides that have not been mixed according to label instructions.

### The impossible is indeed possible


In rare cases, it has happened that producers apply pesticides to potatoes strictly according to label instructions and that MRLs were exceeded. This occurred years ago after cyromazine, an insect growth regulator, was applied.

Research by registration holders proved that the proposed pre-harvest interval was too short to reach the regulated MRL and an

application was therefore submitted to adjust the MRL upwards following a health risk assessment by toxicologists. If potato producers are faced with similar situations, they must contact the pesticide registration holder to investigate and resolve the issue.

### Take responsibility

The onus is on potato producers themselves to read and follow label instructions. One of the biggest mistakes one can make is listening to someone who says: "Let's try ...". This kind of advice and recommendations are rarely based on label instructions and will be to the detriment of the producer.

Also, do not accept advice claiming that two different brands are identical. Stick to the principle that if a specific product is not registered for use on potatoes it will not work, even if a similar product with the same active ingredient is registered for potatoes. 

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