KEEP WHAT WORKS WORKING

What is resistance?

What is pesticide resistance?

Pesticide resistance is defined as the ability of crop pests (e.g. insects, pathogens, weeds) to withstand the effects of pesticides (e.g. insecticides, fungicides, herbicides).

Resistance results from a pest population losing its sensitivity or susceptibility to a pesticide. This is reflected in the repeated failure of a pesticide to achieve an acceptable level of control. Under normal circumstances, a pest is not expected to survive when the pesticide is applied at the recommended rate.

How does resistance develop?

The mechanism for resistance development is similar for most pests, including insect pests, pathogens (fungi, bacteria and viruses) and weeds (plant pests).

When a pesticide is applied, it controls most of the pests in a population, however those which have resistant genes will survive and reproduce. The frequent, repeated or improper use of pesticides with the same chemical mode of action group enables the resistant individuals in a population to survive and multiply causing a build-up of resistance in the pest population (Figure 1).

The outcome is the pest population has genetically changed to be less sensitive or susceptible to a pesticide, or to a class of pesticides.

Resistance develops over time and depends on several factors, including how fast the pest reproduces (the reproductive rate), mobility of the pest and host range, the persistence and mode of action of a pesticide, and the rate, timing and number of applications.

Resistance develops fastest in situations such as greenhouses, where pests reproduce quickly, little or no immigration of susceptible individuals occurs, and spraying is frequent.

How can resistance be mitigated?

To reduce the risk of resistance developing, best practice resistance management should be followed (refer to the companion factsheet **Mode of Action**) and an integrated approach to crop protection taken (see factsheet **Role of IPM in supporting resistance management**).

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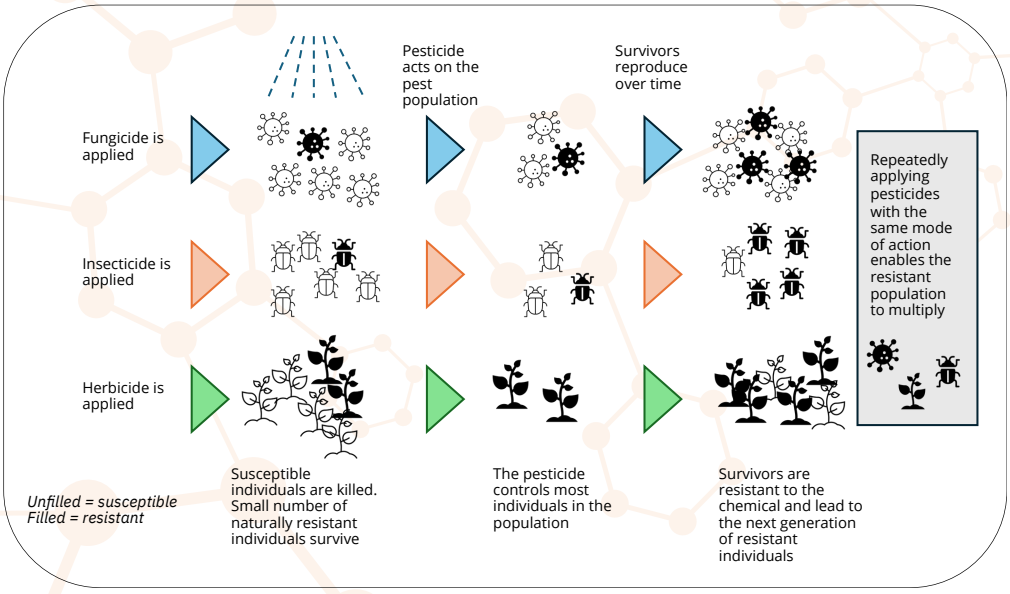


Figure 1. How resistance develops after a pesticide is applied to a pest population.