

Resistance Management – A Global Problem

By Mark Ross

A major global challenge for the agricultural industry is pesticide resistance. A resulting loss of pesticide options can have significant economic and environmental consequences.

Pesticide resistance occurs when there is a shift in the genetics of a pest population that allows individuals to survive. It develops in all agricultural pest groups, and initiates when a very low number of pests survive a pesticide and become resistant.

Fortunately, resistance is not yet a significant problem for the majority of New Zealand growers. Although there are pockets of resistant species in some sectors, a wide range of products are effective against pests.

Having a range of pesticides available is crucial to managing resistance. Keeping a variety of products available requires manufacturing companies to navigate through a number of hurdles.

One major hurdle is the high cost of developing new products, along with high re-registration costs for older pesticides.

In New Zealand the process is compounded by the low level of data protection for new application registrations, making it difficult for companies to gain a profitable financial return. To overcome this, Agcarm is advocating for a legislative amendment that will provide greater data protection, thus encouraging new product registrations and greater investment into new technologies by crop protection companies.

Another challenge is that, in most cases, it is difficult and expensive to assess the level of resistance. For example, an extensive process of trial and error is needed to identify the cause of resistance in weeds that are resistant to more than one product. This can be expensive and time-consuming for the crop producer.

Weeds are adaptable to many environments. For example, when repeatedly mowing lawns close to the ground, weeds can overcome the lawn. So, it is not surprising that weeds can adapt to certain herbicide programmes. Weeds are also highly reproductive, with seeds that can survive for long periods and disperse over wide distances.

Managing resistance requires an understanding of the factors that influence its development, and slowing or preventing the resistance from happening. This involves having strategies to overcome resistance.

Before assuming pest resistance, a number of factors need to be ruled out. This includes misapplication of the pesticide, unfavourable weather conditions, improper timing of the application and poor crop management.

When using fungicides, insecticides or herbicides, follow the label instructions, especially when it comes to the rate of application. An experienced advisor will be able to assist with developing a spray strategy, but if the manufacturer's instructions are not followed, then resistance is more likely.

A good resistance strategy includes rotating pesticides, crop rotation as well as other management practices such as good hygiene and combining pesticide applications.

Follow these five steps to manage pest resistance:

1. Apply pesticides according to the label – every time
2. Expect some level of resistance
3. Have a strategy to address resistance
4. Identify the root cause by trial and error
5. Get the right advice – talk to your supplier or distributor

Evolution and nature cannot be stopped, so keeping on top of resistance by using an integrated pest management strategy will mean one less problem for agricultural producers in the mix of farming challenges.

Dealing with resistance is part of life, whether it is to a child's tantrum, a change in workplace, or nature getting the better of mankind. No matter what sort of resistance we encounter, there are ways of navigating through it to make sure that it is effectively managed.

- Mark Ross is the chief executive of Agcarm, the industry association for companies which manufacture, distribute and sell crop protection products.