4,500 Years of Crop Protection

By Mark Ross

Like all agricultural innovations, crop protection products have evolved tremendously since their inception. From natural chemical elements, to plant and metal-based insecticides, to synthetic products, formulations have drastically changed for the better. Today's products are more sustainable, targeted, efficient and environmentally-friendly than their predecessors.

The first recorded use of an insecticide was about 4,500 years ago by the Sumarians, who used sulphur compounds to control insects and mites attacking their food sources. In the first century B.C., Romans made a compound from crushed olives, burnt sulphur and salt to control ants and weeds in their crops. In 800 A.D., the Chinese used arsenic mixed with water to control insects in their field crops and citrus orchards. Other pesticides, derived from natural sources such as pyrethrum from dried Chrysanthemum flowers and nicotine extract from tobacco plants, evolved over time.

From 1750 to about 1880, farmers began using crop protection products more widely and international trade promoted the use of plant and metal-based insecticides. Until the early 1900s, Europe and the U.S. used compounds made with sulphur, iron, copper, arsenic and sodium to control weeds in cereal crops and fungus in grapes. In the 1930s and 40s, effective and widely used fungicides were developed along with the first synthetic insecticides.

By the 1960s and 70s, farmers began to utilise Integrated Pest Management (IPM) to control pests. IPM is based on the idea that farmers can manage insect pests, using crop protection products only when needed. This practice paved the way for the development of more targeted and environmentally-friendly products, such as pyrethrum-based formulations.

With improved research, the plant science industry began developing more efficient products that were effective at lower rates, such as 10 mls of active ingredient per hectare rather than 180 mls used previously. Herbicides like glyphosate, which are still commonly used today, were developed in the 1970s and have continued to improve and become more efficient over time.

In the 1990s, scientists concentrated on finding active ingredients that better target pests. Through biotechnology, plant scientists also improved the IPM concept – using naturally occurring materials such as insect hormone or venom, microbes or plant material extracts like *Bacillus thuringiensis (Bt)* – to more accurately and selectively target pests. Finally, weed treatments, such as neonicotinoids, were developed during this time to protect emerging seedlings from pests while not impacting beneficial species like pollinators.

The plant science industry invests heavily in research to develop new products, ensuring that they do not pose unacceptable risks to humans or the environment. In fact, it now takes about $286 million USD and 11 years of research and development to bring a new crop protection product to market.

In New Zealand Agcarm and our member companies, along with the CropLife network, remain focused on stewardship and ensuring that there will continue to be a variety of new products in the future to offer pest control solutions for crop growers. Agrichemicals that are more environmentally-friendly, more effective and more targeted thus allowing farmers to better control target pests, while allowing beneficial flora and fauna to prosper.

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