

OVERVIEW OF NEW CROP PROTECTION PRODUCTS



Tim Belleville, E.E. Muir & Sons

Protecting valuable crops is obviously a top priority for growers. However, there are a number of major trends occurring, both in terms of where products come from and what is available.

COMPANY CONSOLIDATIONS

This is a process driven by increasing costs of R&D, declining profits and shareholder expectations. Whereas there were 10 major agrochemical companies in the US and Europe in 1990, mergers and acquisitions have halved this number, leaving Bayer, Corteva (DowAgro), BASF, Sumitomo, Syngenta Group (now part of China National Chemical Corporation) and FMC corporation (previously part of DuPont)¹.

Larger companies are better able to invest in expensive research, so this may potentially increase, not decrease, products available.

OLDER CHEMISTRY OUT!

The number of chemical groups used in crop protection products has skyrocketed since the 1960s. Whereas, in 1960, farmers had available around 100 active ingredients from 15 chemical groups, today there are

at least 600 active ingredients from more than 40 different groups².

However, despite continuing high levels of investment in R&D, the rate of new products coming onto the market has slowed considerably. Only 39 new actives came onto the market between 2010 and 2020, compared to more than 100 in each of the previous five decades (Figure 11).

Moreover, concerns about worker safety, food safety and, importantly, environmental safety have seen many products banned. For example, six of the top 10 agrochemicals used in the US in 1968 are now banned. In Europe, changes in regulations have removed more than half (293 of 499) of the crop protection active ingredients previously available².

In some cases, companies have voluntarily withdrawn chemicals from sale; there can be substantial legal risks from application, even for registered products demonstrated to be safe, which can be difficult or impossible to insure against (M. Eberius, CropZone, pers. com.). In other cases, a shrinking market, together with increased registration costs, has made sale no longer viable.

BIOLOGICALS IN

There has been a major increase in research on biological options over the last few years, not only by the larger companies but also by small companies and start-ups. Development has been encouraged by easier regulatory processes (at least in the US and the EU), increased

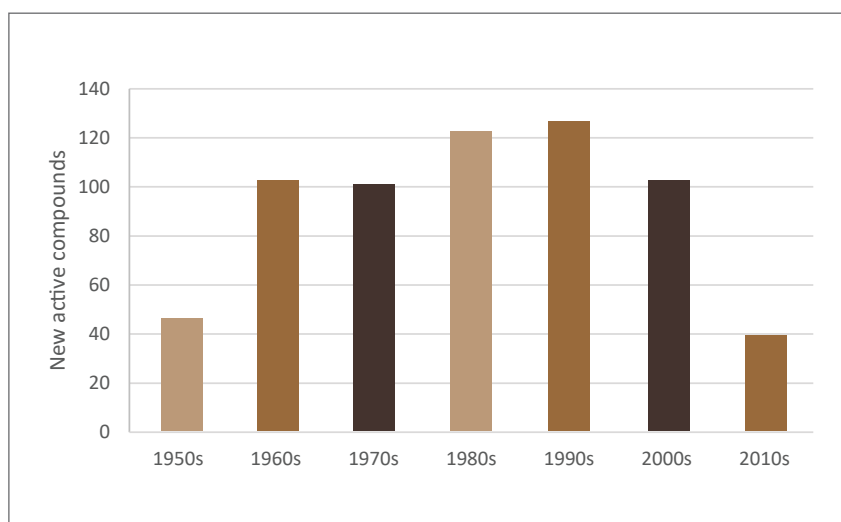


Figure 11. Number of new active ingredients introduced per decade. Derived from Phillips McDougall, 2018

¹ Nishimoto R. 2019. Global trends in the crop protection industry. J. Pesticide Sci., 44:141-147

² Phillips McDougall. 2018. Evolution of the crop protection industry since 1960. Report for Crop Life International, 20pp

adoption of IPM and demand for reduced chemical residues by farmers, regulators, customers and consumers.

The number of new biological products now exceeds the development of conventional chemicals, a trend that seems likely to continue.

But what is a 'biological'? They include fertilisers (e.g. rhizobia), stimulants, biochemicals such as plant extracts and pheromones as well as various fungi, bacteria, viruses and predatory organisms that target specific pests or diseases (Figure 12).

According to Tim, "In the past we might have been cautious, but biologicals do seem to be getting more reliable, and we need to look at how we can fit them into our crop protection programs. Changing to biologicals does create challenges. It's not as easy as just see a pest, spray a pest, it requires a broader scope of thinking."

One of the biological products E.E. Muirs has seen good results for is EndoPrime by Sumitomo. EndoPrime contains beneficial mycorrhizal fungi. Mycorrhizal fungi can enhance uptake of nutrients from the soil, as well as buffering plants from stress.

"We've been seeing some really good results with EndoPrime in the field," said Tim, "as well as Serenade Prime. Bayer are continuing to invest in Serenade, and new upgraded products are on their way, so that's one to watch."

"More on the conventional side, we have recently found the new Miravis by Syngenta to be really good against Target Spot. Syngenta have now launched Miravis Prime, a blend of Pydiflumetofen (Group 7) and Fludioxonil (Group 12), so that broadens the spectrum to include diseases such as *Sclerotinia*," commented Tim.

"Another newer fungicide is Amishield by NuFarm. This is a Group 12 with good action against both pink rot and powdery scab. It is a protectant, not a systemic, so it's really important that it's applied at planting and in the right spot."

SIVANTO prime is still waiting for APVMA approval but, all going well, will be released later this year. The product targets silverleaf whitefly and green peach aphid. "It's Group 4D, and appears to be the only product in this class, so that's a really new chemistry," said Tim. "Like many of the newer insecticides, this is a soft chemical that should be compatible with IPM programs."

The performance of biological products is affected by conditions in the field, and they don't have the long shelf life of conventional chemicals. There can also be problems with availability; it's hard to suddenly increase or decrease production.

However, with a huge research effort behind them, they may well be the way of the future.

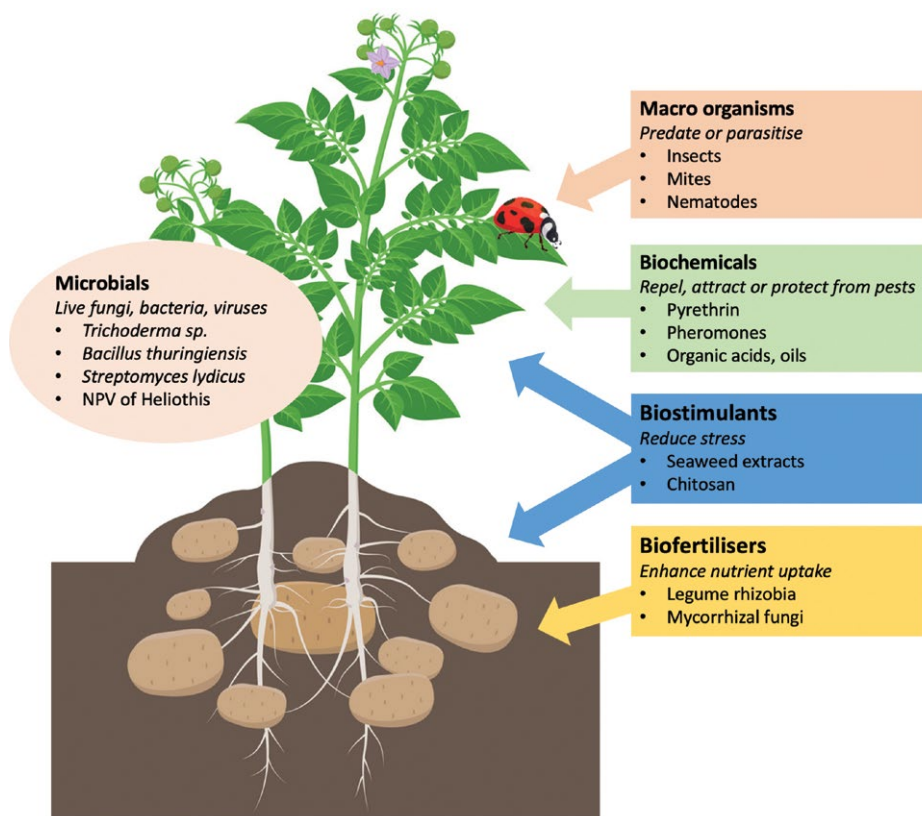


Figure 12. Types of biopesticides