



An Overview: Chemical Crop Protection

Much like human medicines, crop protection chemicals – pesticides – are well-tested to keep crops healthy and our food safe while also helping to preserve our vital natural resources.

The Basics

- // **What:** The broad class of chemicals that protect crops are called pesticides. Pesticides include herbicides (protect plants from weeds that compete for sunlight, space, nutrients and water), fungicides/bactericides (protect plants from fungus and bacteria that cause diseases in plants) and insecticides (protect plants from insects that like to feed on a particular crop).
- // **Why:** Without effective crop protection tools, much of the food that is grown on a farm would be consumed by pests, destroyed by diseases or overcome by weeds.
- // **How:** Crop protection chemicals help farmers produce enough food on less land to help meet rising demand while preserving vital natural resources.

The Background

Protecting crops from pests is as old as what we now know as farming itself. The Sumerians, credited as the “inventors of agriculture” around 5,500 BC, were known to have used sulfur compounds to protect their crops from insects.¹ In the 20th century, our understanding of chemistry improved and allowed scientists to develop more precise crop protection targeted at specific pests. This understanding allowed scientists to create increasingly safer and more effective products including products like seed treatments that could protect individual plants without broad spray applications. Much like human medicines, crop protection products are well-tested so they can keep plants healthy without harming people, wildlife or the environment. As a part of modern agricultural practices, crop protection products help preserve vital natural resources to make farming more sustainable.

The Highlights

Though there are few crops, there are many threats.

- // A farmer’s crop may compete with up to 30,000 different weeds, 10,000 species of insects, 3,000 types of nematodes and 50,000 diseases caused by bacteria, fungi and viruses.²
- // Each year, 20-40% of crops are lost even *with* the use of crop protection products. Without crop protection, these losses could be at least 50% more.^{3,4}
- // Even after being successfully harvested, our food can still be impacted by pests. Many insects and diseases can ruin stored food before it can even be distributed.

Crop protection products help make our food abundant, healthy and safe.

- // Most of today’s crops aren’t naturally resistant to the many weeds, pests and diseases that attack them so farmers use crop protection tools to keep them healthy.
- // Studies show that using crop protection tools can save around \$60 billion USD on crops that would otherwise be lost to pests.⁵
- // By using crop protection products when needed, farmers can increase the odds that their crops will be successfully grown, harvested and delivered to consumers.
- // Chemical crop protection tools may not be the only solution, but they are a key component of nearly every successful integrated management program used throughout the world.

References

1. CropLife International: <https://croplife.org/news/4500-years-of-crop-protection/>
2. CropLife International: <https://croplife.org/news/why-we-need-crop-protection-products/>
3. OECD-FAO: https://www.oecd-ilibrary.org/agriculture-and-food/oecd-fao-agricultural-outlook-2012_agr_outlook-2012-en
4. FAO: <http://www.fao.org/plant-health-2020/about/en/>
5. FAO (p. 8): <http://www.fao.org/3/i8168en/i8168EN.pdf>



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The Highlights

Crop protection chemicals are safe to use.

- // Crop protection chemicals undergo years of rigorous testing before they are sold so that they can be safely used without harming people or having unacceptable effects on the environment.
- // Before a pesticide is submitted to an authority to be registered, it undergoes up to 10 years of testing and safety evaluation by Bayer.
- // Finding chemical residues on foods does not mean they are unsafe. Government regulators establish levels of crop protection chemical residues that can be safely eaten on our food. A product is generally considered safe for use when likely exposure is at least 100 times lower than the dose that causes no adverse effects.⁶
- // After use of plant protection products according to the product label, residue levels on food - if any - are far below any level of concern for consumers. At the levels typically found on food, people would have to eat hundreds of servings per day before being at risk of harm from pesticides.

Crop protection chemicals help make farming more sustainable.

- // Without crop protection chemicals, more farmland would be required to make up for the crop losses that would occur. These products enable enough food to be grown on less land.
- // Modern farming practices use crop protection chemicals to help reduce the need for ploughing, which conserves water, reduces soil erosion and absorbs greenhouse gases.
- // Crop protection chemicals keep plants healthy and help farmers make a living – a key aspect of sustainability. In many rural areas, farming is the primary engine of economic growth.
- // Crop protection chemicals are a win-win for society. They help make farming more profitable for producers and make food more abundant and affordable for consumers, while also decreasing harmful microorganisms and naturally occurring toxins on crops, preventing food-related illnesses.
- // Digital tools and precision agriculture techniques are enabling farmers to get the most out of their fields while using less land and fewer inputs: helping farmers apply the right product in the right place, at the right time and in the right amount.

Key Things to Remember

- // Most of today's crops aren't naturally resistant to the many weeds, pests and diseases that attack them, so farmers use crop protection tools to keep them healthy.
- // Crop protection chemicals undergo years of rigorous testing before they are sold so that they can be safely used without harming people, wildlife or the environment.
- // Crop protection chemicals are a win-win for society. They help make farming more profitable for producers and make food more abundant and affordable for consumers.