However, the use of hazard-based assessments, which are mandated under the European Union’s new plant protection Regulation EC 1107/2009, could put the EU’s crops, and especially cereals, at risk without benefiting human health or the environment. While it is important not to underestimate the potential risks inherent in any artificial crop protection technology, it is also true that these products, which have been demonstrated safe for use over decades, continue to play a vital role in increasing and sustaining EU farm incomes and the supply of many food crops.

What would an EU wide ban of triazole fungicides achieve?

It would greatly reduce the farmers’ ability to effectively combat important crop diseases such as Septoria. This would result in higher costs for farmers, who only have few possibilities to control potentially devastating crop diseases already. It was recently estimated that this could cost EU up to € 4.6 billion, the cost of which would ultimately be borne by both producers and consumers. Such a ban would significantly reduce yields, changing the EU from a net wheat exporter of 8.7 million tonnes, to a net importer of 9.6 million tonnes.

Consequences for world population

With the global population predicted to reach 9 billion people by 2050, the threat of losing access to triazole fungicides represents a real threat to the EU’s agricultural productivity. Demand for wheat within the EU is expected to rise by 21% and it cannot be supported by the currently expected 7% rise in production. Thus, any measures that would further reduce EU crop yields and increase dependence on imported food should be considered very carefully before implementation.

New and emerging infectious crop diseases seldom reach the news, but can nonetheless represent a real threat to agricultural productivity. The re-emergence of UG99 provides a good example. It is a devastating strain of rust fungus which has spread the length and breadth of Africa in less than a decade and now sits at the gateway to Asia and Europe.

Triazole fungicides represent a vital component of modern conventional farming systems, as part of a diversified mix that helps protect crops and European food supplies. While their use may be associated with a certain level of risk, a sensible and pragmatic interpretation of EU regulations could ensure that they can continue to be used safely, helping to ensure a supply of healthy and affordable food, while complying with the highest degree of environment protection.


Are azoles a threat to human health and the environment?
Are azoles a threat to human health and the environment?

Fungal diseases such as Septoria are extremely difficult to control in agriculture without the use of fungicides. Like other authorised crop protection products, fungicides can be used safely and effectively under practical agricultural conditions, when used according to the label instructions and applied by professionals. Among the most effective ingredients in fungicides is the azoles family of compounds.

Effects on human health

Over the last decade, many older fungicides and crop protection products were removed from the market. Fungicides which are still approved for use in the EU meet the most stringent human health and environmental safety standards in the world. When tested under laboratory conditions at excessively high concentrations, in some cases at concentrations which would be the equivalent doses many thousands of times higher than those used under practical farm conditions, triazole fungicides can be toxic. However, use of these fungicides does not represent a danger for human health or the environment.

Extensive official testing has demonstrated that levels at which farmers and consumers could be exposed would never reach the extremely high concentrations which would be required to cause toxic effects.

Fungicides as endocrine disruptors

The endocrine system uses naturally produced chemicals called hormones to regulate many functions in our bodies. These hormones also have a capacity to influence other aspects of life, including growth and development, regulation of the body’s internal environment, and development from foetus to adulthood.

In November 2009, a workshop of international experts met in Brussels to discuss the effects of dietary exposure to endocrine-active pesticide residues on food, recognising that these chemicals are increasingly being accused of being endocrine disruptors. Interestingly, no substantial evidence was identified linking currently authorised fungicides to harmful endocrine effects in humans.

There is, however, much controversy and debate over what constitutes a harmful endocrine disruptor, and which characteristics should be used to identify these substances. The European Commission is obliged to address this question and to adopt a definition for endocrine disruption by the spring of 2013.

Effects on the environment

Crops must be healthy to produce sufficient quantities of safe, high-quality food with an attractive appearance and good shelf life. Plant protection products improve the health of crops, increasing their vitality by protecting them from pests and diseases and allowing them to use water more efficiently.

The use of the azoles in fungicides under normal farming conditions helps prevent the spread of fungal crop diseases. If left untreated, these diseases drastically reduce quality and yields, severely reducing farm incomes and food supplies. Triazole fungicides are also used to promote low-tillage agricultural systems, which reduce carbon footprint, loss of soil nutrients, and help to prevent soil erosion.
Argentina, Brazil, Canada, China, India, Russia, and the Ukraine would be beneficiaries of such an EU ban on the use of azoles. The already high global prices for these products would increase, creating further difficulty for net importing countries already struggling to finance high food import bills.

As yields would decrease in existing farmland, more land would have to be cultivated to feed a growing global population. This would threaten natural habitats.

It is calculated that total annual EU losses in case of a ban of azoles could be as much as $5.6 billion, with much of the cost being borne by farmers and consumers.

EU consumers would be adversely impacted by increased prices for the vast selection of products that depend on wheat for their manufacture. Not only would directly related products such as bread become more expensive, but also poultry and cattle, which are fed partly on wheat. The estimated loss to EU consumers and taxpayers would amount to an additional $173 million.

Resistance: the great danger for European agriculture

It is critical for farmers to retain access to a diversity of different azole fungicides, in order to prevent or delay resistance.

Important cereal fungal diseases, including Septoria and rust, have developed resistance to certain fungicides. The azole class of fungicides, and particularly triazoles, however, can still be used to fight these diseases. However, experience has demonstrated that, just like antibiotics, it is critical for farmers to have access to a range of different types of fungicides and also different triazoles, to avoid resistance. Farmers fear that further regulation could reduce the diversity of this important resistance management tool box.

Credible options for farmers are limited.

To develop new fungicides requires high investments and a long development cycle; greater than 200 million euros over a period of 10 years. In the past 30 years only two new classes of fungicide have been developed, which can control the most important cereal disease, Septoria. As a result, today, farmers only have few remaining options available to fight against these important cereal diseases and to sustain EU agricultural productivity.

Should the European Union decide to ban use of azole fungicides, due to use of its new hazard classification regulation, the sustainability of Europe’s cereal harvest would be put at risk. While it is important not to underestimate potential hazards associated with modern farming, it is equally important to avoid overcompensation of well-managed risks, such as the responsible and professional use of azole fungicides.

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European Cereals Under Threat

The European agriculture sector is worth €625 billion a year and employs more than 11.2 million people. Cereals are the most widely grown crops grown in the European Union, and wheat is Europe’s most important commodity crop. Farmers fear the risks their crops face from not just weather, but also from the ever present threat of weeds, pests and disease. Fungal diseases have always threatened arable crops, with potentially devastating consequences. If left untreated, they can destroy up to 40% of the total harvest

What are azoles?

Azoles fungicides are one of the most powerful weapons used against fungal diseases which threaten wheat production. These chemical substances are highly effective for controlling Septoria and rust pathogens, which represent the greatest disease threat to cereal production.

Fungicides considerably reduce yield losses and enable the cultivation of high yield varieties, which would otherwise be susceptible to disease. According to the UN FAO, fungicides prevent losses estimated to be between 15-30% of global wheat harvests. European wheat yields more than doubled between 1960, 20 years after the first appearance of fungicides, and 2008: from 1.25 to over 5 tons per hectare. This increase in yield supports the EU population and as the only major commodity crop where Europe is a net exporter, it also makes an important contribution to food security.

The Hazard vs. Risk approach in EU legislation

Further implementations of EU Regulation 1107/2009 will assess fungicides such as azoles on hazard rather than risk. Hazard is a term used to describe a source of potential damage, harm or adverse health effects. Risk is a term which is used to describe the chance or probability that a person or the environment could be harmed or experience adverse effects, if exposed to a hazard. So, for example, use of a car could represent a serious hazard, but when used correctly, the risk is acceptable and it is possible to benefit from its use.

Based on scientific risk assessment, currently used crop protection products, including azole fungicides, are approved for use because it has been scientifically demonstrated that they will not harm humans or the environment. However, the EU regulatory processes have recently moved from scientific risk assessment to regulation based on hazard. A potential consequence of this change could threaten or severely curtail continued use of the azole fungicides, upon which modern high yielding cereal production depends.

Risks faced if azoles were banned

Economic impact

If the use of azoles were to be banned in the EU, the short to medium term effects would change the EU from being a net exporter to being a net importer, not only of wheat but also of sugar and coarse grains. Furthermore, it would increase its net import position with regards to oilseeds and maize.