

PROJECT COMPASS

**THE SOCIO-ECONOMIC, TECHNOLOGICAL AND
ENVIRONMENTAL VALUE OF NEONICOTINOID SEED
TREATMENT IN THE EUROPEAN UNION**



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INTRODUCTION

A first comprehensive review of the value of neonicotinoid seed treatment, one of the most innovative forms of pesticide crop protection technologies within farmers' toolbox has been published by the Humboldt Forum for Food and Agriculture e.V. (HFFA). Supported by Copa-

Cogeca (European Farmers Union), ESA (European Seed Association) and ECPA (European Crop Protection Association) – in collaboration with Bayer Crop Science and Syngenta – the study team (Steffen Noleppa,

agripol; Thomas Hahn et al., a-connect) investigated the socioeconomic and environmental contribution made by this technology to the European Union across major

crops and key countries. This work highlights the game changing nature of neonicotinoid seed treatment, and the catalysing role it plays in modern agriculture, as well as demonstrates the impact should the technology no longer be available.

WHAT IS A SEED TREATMENT?

Seed treatment is one of the most advanced and targeted forms of crop protection. The chemical ingredient is applied to the seed as a coating prior to planting. In the case of Neonicotinoid seed treatments, the insecticide is absorbed and distributed within the plant as it grows. This

enables the plant to control pests that feed on it below or above ground. These threats to the plant can easily destroy the harvest, wasting huge amounts of natural resources (water, soil, nutrients), energy, and labour.

WHAT ARE THE ADVANTAGES OF NEONICOTINOID SEED TREATMENT?

Neonicotinoid seed treatment is highly specific, and one of the most efficient forms of crop protection technology because of its targeted action and low application dose, long lasting protection against pests that destroy crops especially when the plant is small and most vulnerable. It reduces or even eliminates the number of insecticide sprays, which are needed over the course of the growing season. Safe and targeted use of Neonicotinoid seed treatment therefore reduces the exposure to pesticide chemicals on large areas of farmland. Moreover, this innovative technology improves plant vigour, lowers

overall pest population, improves crop yield, and lowers farming costs. This enables farmers to improve their productivity and profitability, manage risks and adversities, reduce workload as well as operational complexity, and innovate and professionalize their businesses. The technology is thus a key tool in addressing pest resistance problems and it reduces overall pest pressure for all farmers, including organic growers. Seeds treated with Neonicotinoids include corn, cereals, sugar beet (SB), oilseed rape (OSR), sunflower (SF), and other crops.

WHAT IS THE EXACT ECONOMIC CONTRIBUTION OF NEONICOTINOID SEED TREATMENTS?

The study shows that, when assessed against existing second-best alternatives, Neonicotinoid seed treatment contributes more than €2bn annually to commodity crop revenues and reduces productivity costs by nearly €1bn across the EU. The true value of Neonicotinoid seed treatment to the grower, when compared to not using pesticides at all, exceeds €4bn per year. If this technology were no longer available to the farmers, these productivity benefits would be lost and prices of agricultural raw commodities would increase by up to 2% on top of the current commodity price rally. To put this in perspective, this price increase is of the same order of magnitude as one that would result from production losses of major grain producers like Russia or Australia due to harsh weather conditions, as has been reported for these countries this fall. The immediate damage to EU wealth would be as large as €4.5bn annually—similar to the value added by the agriculture of Member States such as Austria or Finland.

Taken over a 5-year period, the EU could lose up to €17bn, and in the long run face a significant increase in pest pressure on crops, which would no longer benefit from protection by this technology. In many crops, Neonicotinoid seed treatment has become so integrated into agricultural practice that there is no viable alternative to this form of insect control in the foreseeable future.

Over 1 million people are engaged in arable production and their livelihoods would suffer greatly if this technology were lost. On average, farmer income would decrease by 5%. However, in many areas and for many farmers the loss would be much more severe. Most worryingly, at least 50,000 farm jobs would also be lost across the EU, mainly in Eastern Europe.

WHICH CROPS AND COUNTRIES ARE AFFECTED?

Neonicotinoid seed treatment technology is embraced by many farmers across Europe for all the crops reviewed. For example, sugar beet farmers strongly depend on this technology, which has transformed their industry since it was introduced in the 1990s. The technology has the potential to also fully transform Oilseed Rape production and many key growing countries already rely on it.

Neonicotinoid seed treatment is also becoming invaluable for corn and forage maize and currently addresses severe

pest problems for approximately 40% of key European growing areas. Neonicotinoid seed treatment is used on approximately 60% of the Sunflower growing areas in the EU and increasingly on Wheat and Barley to help growers cope with damaging pest issues, primarily in Western Europe.

The study showcases many examples of regions and stakeholders that benefit from the use of Neonicotinoid seed treatments, some of which are outlined below:

IMPACT ON THE EUROPEAN CORN SEED INDUSTRY



Over 80% of corn seed production is concentrated in France, Hungary and Romania. Seed growers and multipliers rely on Neonicotinoid seed treatment to supply European corn farmers with the seeds they need. We already see declining corn seed stocks due to productivity volatility, which would be further exacerbated if Neonicotinoid seed treatment were no longer available. Without the use of seed treatment, the European corn seed supply would be threatened. Seed production is a complex and difficult procedure and yield losses could not be easily replaced by an immediate increase in production area. Neonicotinoids secure the profitability of the seed production industry and a French seed producer pointed to the real possibility of relocating seed R&D and production outside the EU to countries like the Ukraine and Russia. Up to €120 million of value to the EU corn seed value chain could be lost if Neonicotinoid seed treatment were suspended or banned.

In countries like Hungary, where seed multiplication industry contributes nearly €700 million to the national production, the impact on wealth, jobs, exports, and growth could be even more acute. Seed production in Hungary provides income for tens of thousands of farm workers and the social impact of a decline of the Hungarian seed industry would be severe.

WINTER WHEAT IN THE UNITED KINGDOM



Winter wheat farmers in the UK rely on Neonicotinoids to control severe fall pests while managing complex farming operations. Current farming practices for winter wheat therefore strongly depend on Neonicotinoid seed treatment and the loss of this technology could lead to a yield decline of up to 20%. Without Neonicotinoid seed treatment, the production of winter wheat would no longer be profitable for many farmers.

OILSEED RAPE AND SUGAR BEET IN GERMANY



Oilseed Rape (OSR) growers in Germany have no viable alternative to Neonicotinoid seed treatment to ensure competitive returns under potentially high pest pressure from Cabbage Root Fly and the Rape Flea Beetle. Without such protection, yields could be reduced by up to 20% in key areas such as Western Mecklenburg-Vorpommern under adverse conditions, and erode farmer margins by more than 60%. This could make OSR cultivation less competitive, increase the EU dependency in vegetable proteins, and reduce the food supply provided by OSR for bees. By making rotational crops more profitable, Neonicotinoid seed treatment contributes to the diversity of agricultural crops in some European regions.



For Sugar Beet, Neonicotinoids are now an integral part of modern European sugar production. Without Neonicotinoid seed treatment, overall pest pressure could dramatically increase, lower yields by 10-20%, significantly erode grower margins and undermine the efforts of the European sugar growers to be more competitive on the world market. Under these circumstances, and without the current subsidy, which the EU has committed to phase out, Sugar Beet production in Germany and other countries could become unsustainable.

Neonicotinoid seed treatment has also benefited organic growers of Sugar Beet even though they do not use the technology directly. This is because the general use of the Neonicotinoid seed treatment in key Sugar Beet production areas has managed to reduce the pest pressure for all types of production. Without it, organic growers would suffer from the rise in pest pressure impacting on yields and eroding margins by up to 35%.

SUNFLOWER EARLY PLANTING IN SPAIN



Neonicotinoid seed treatment has enabled many innovations in farming practices, including the planting of Sunflower in Andalucía as early as January as opposed to the normal practice of April. The seed treatment enables control of wireworms during the winter germination. Planting early also makes better use of soil moisture and water, and additional yields in Sunflower of 20-30% have been seen for a product that has been embraced by the public because of its health benefits. In time of a severe economic crisis in Spain this technology provides the opportunity for this region (Andalucía) to generate more than €50 million annually.

WHAT WOULD THE IMPACT BE ON GLOBAL FOOD PRODUCTION?

Europe plays a key role in maintaining and increasing the global food supply to feed an increasingly populous planet experiencing significant changes in dietary demands, while protecting natural resources. If Neonicotinoid seed treatment were no longer available in Europe, there would be a significant reduction of food production dramatically altering the commodities trade balance. The study shows **that the net exports** of barley and wheat would decline (where EU growers enjoy a clear competitive advantage) and the EU would need to **increase the net imports** of corn, raw sugar and vegetable protein sources such as soybeans to compensate for a shortage of protein feed

from OSR. Europe would also become a net importer of sunflower.

For some farmers, an immediate consequence of a reduction in feed production could be increased production costs of livestock. Pork producers, for example in France, have hitherto relied on a stable supply of local corn feed which accounts for up to 65% of their total production costs. Any threat to that local production arising from a loss of Neonicotinoid seed treatments, resulting in an increase in feed sourced globally, would erode their already very thin margins.

ARE THERE ANY ENVIRONMENTAL IMPLICATIONS?

Any reduction in agricultural productivity - due to Neonicotinoid seed treatment no longer being available to the farmer – would need to be compensated by making new arable land available outside of the EU. Today, Europe already virtually net imports approximately 29 million hectares of land to meet its food demand. According to the model developed by Humboldt University and agripol,

this virtual import would increase by a further 3.3 million hectares of (generally less productive) arable land outside the EU, which would have to be brought into production. The environmental cost of converting this land for arable use would be around 600 million tons of additional CO2 emissions, which is equivalent to up to €15 billion in emission certificate value.

IS THIS TECHNOLOGY SAFE TO USE?

If used correctly, Neonicotinoid seed treatment can be used safely for all major crops across Europe. The crop protection industry is engaging in active stewardship to ensure that this is the case. In addition, the seed, seed treatment, and crop protection industries have recently implemented quality assurance and user information measures to further improve safe use.

Still, the technology has come under pressure in recent years because of the alleged role it plays in the worrying decline in bee health as certain stakeholders and NGOs

have argued that pesticides, including Neonicotinoid seed treatment, are the primary cause of the problem.

While there is no scientific evidence that Neonicotinoid seed treatment is primarily responsible for the decline in bee populations and most experts agree that this decline is multifactorial and point to disease, viruses and loss of habitat, as the likely primary causes, The European Commission has charged the European Food Safety Authority (EFSA) with a review of the safety of Neonicotinoid seed treatment for bee health.

HOW WAS THIS STUDY CONDUCTED?

The study started in late Spring 2012 and is based on data that was collected at a country level from a broad base of experts and practitioners. It reflects the local pest pressure situation as well as current farming practices. This allowed the study team to assess “what would actually happen” if Neonicotinoid seed treatment technology were lost, and what current value contributions and opportunities the technology “brings to the table”. Based on this information, the authors deployed state of the art, academically proven market models to assess wealth, labour, price, trade-balance, and climate impacts.

In addition, the study team engaged and interviewed many farmers and industry experts across Europe to identify areas where Neonicotinoids play a particularly transformational and important role and where, consequentially, a loss of this technology would have the most severe impact. Together with these stakeholders and based on previous economic studies, the authors developed business cases that showcase the detailed value of Neonicotinoid seed treatment technology in the corresponding businesses.

WHAT SHOULD BE DONE?

This study shows that the socio-economic, technological, and environmental value contribution of Neonicotinoid seed treatment is extremely significant. The study also underlines the importance of looking at agriculture holistically. An action taken in one area, not fully considered, can have major unintended consequences elsewhere.

The study shows, perhaps surprisingly, that Neonicotinoid seed treatment has become an integral part of European agriculture and significantly contributes to European food production. If this technology were no longer available, food production would decline by an amount sufficient to feed many millions of people.

The supporters of this study wish to make clear that they strongly believe that agriculture in general as well as their individual businesses also strongly depend on

healthy and thriving bee populations. Nevertheless, they also argue that farmers and growers need access to a toolbox of safe and innovative technologies, which can be used to maintain and enhance their productivity and competitiveness. The supporters of the study therefore urge policy makers to focus on realistic agricultural practices and corresponding safety risks, to species such as bees, rather than theoretical ones, and to take account of the practical risk mitigation measures as means to assure that effective crop protection and (bee) safety go hand in hand.

The supporters of this study stand ready to play their full role in helping to achieve this objective.

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