

*One Step Ahead
with Sustainable
Agriculture*

Hof ten Bosch – Belgium



*Bayer
Forward ►►
Farming*

Why we are Forward Farmers

“Farming is a challenging job. We work to produce food, seven days a week, 365 days a year. On 140 hectares we grow potatoes for the potato crisp industry along with wheat, corn, sugar beets and rapeseed. We also cultivate pears on another three hectares, a portion of which we sell directly at the farm. We could not handle all of this if farming was not so close to our hearts.

We have been running the Hof ten Bosch farm since 1980 but our family has owned this farm since 1890. Farming is in our genes. When we compare how we grow food to how our father and grandfather did, it is obvious that running a farm has changed in many ways. The various processes on our farm need to interact much more closely now, so time becomes a crucial factor.

After the harvest, the process begins over again with soil cultivation, sowing, fertilization, crop protection and then harvesting again. We have to cope with a strict regulatory framework and are obliged to keep records of everything we do.

All in all, farming has become more complex. Today, we are not just farmers; we are agripreneurs.

For us, farming is not only about earning a living. The challenge we face is to raise productivity and at the same time to maintain the fertility of our fields. This is how we understand sustainable farming. You may ask yourself why we decided to become ForwardFarmers in 2011. The answer is quite simple: Bayer supports us by providing innovative solutions, valuable services and cutting-edge technology for our farm, Hof ten Bosch, so that we can comply with the needs of the environment and nature and the demands of society and consumers and at the same time keep our farm profitable.”

Jan and Josse Peeters,
Hof ten Bosch



Sustainable Farming at Hof ten Bosch



Farm Profile



Location:
Huldenberg, near Brussels.



History:
Farmed by the Peeters family since 1890, owned by Jan and Josse Peeters since 1980.



Farming Land:
100 hectares of own land + 40 hectares leased. Hilly area with a well drained and fertile sandy loam soil.



Crops:
Potatoes, wheat, sugar beet, corn, rapeseed and pears.



Partners:
Fruitful collaborations with both public institutions (University of Ghent, Vogelbescherming Vlaanderen) and private companies (PepsiCo, Beutech).

Key Elements

1 Seeds

High-quality, certified seeds are the basis for healthy and productive crops and support Integrated Pest Management practices.

2 Crop protection

Chemical and biological crop protection products, as well as mechanical measures, are combined for sustainable production of healthy food.

3 Bayer SeedGrowth®

The fully integrated and comprehensive system for on-seed applications helps seeds to thrive and boosts yields.

4 Precision farming

Precise application using GPS and Variable Rate Application (VRA) ensures sustainable and efficient use of crop protection products.

5 Decision support tools

Information regarding weather and soil conditions, as well as pest and disease warnings, are used to optimize the timing of crop protection product application.

6 Soil erosion

Buffer strips and micro dams in potatoes prevent soil erosion and washing off of fertilizers and crop protection products to the surface water.

7 Functional biodiversity

Biodiversity is stimulated with flower strips at the field margins. The creation of a bee friendly garden and nesting places for wild bees and birds enhances pollination and natural pest control.

8 easyFlow®

Thanks to the development of the closed filling system easyFlow® the exposure of users and the environment is limited to an absolute minimum.

9 Phytobac®

An adapted farmyard infrastructure with a special filling and rinsing place and a Phytobac® prevents runoff into the environment.

10 Personal protection equipment

Operator safety can be ensured by using correct personal protective clothing (dresscode.bayer.com).

11 Bee hotel

Supporting bee health through pest and varroa control, pollen and nectar offerings as well as the correct use of crop protection products.

12 Partnerships

Bayer ForwardFarming brings together the competencies of mutually beneficial partnerships into a single holistic system.

■ Tailored Solutions ■ Proactive Stewardship ■ Partnerships

What it takes

to grow a #1 potato

At Hof ten Bosch, premium potatoes for the crisp industry are grown. To meet the requirements of the processing industry, the Peeters brothers have to keep a close eye on many factors, such as soil fertility, water management and quality seed selection – in addition to smart weed, disease and pest control, the optimal use of fertilizers and best handling practices for harvest and storage.

Nowadays, consumers want a clean-looking potato, yellow on the inside, with flawless skin and an even shape. Moreover, the crisp industry requires potatoes that contain a high proportion of starch and low proportions of free sugars for optimal processing.

Fertile soils with high water-holding capacity provide the basis for premium potatoes. Soil fertility is maintained through a four-year crop rotation and the use of yellow mustard as a green manure crop to add and fix nutrients to the rooting zone.

However, numerous external factors affect the crops' health not only in the fields but also during storage, which can take up to eight months, not to mention pests and diseases such as aphids, Rhizoctonia or Phytophthora that pose a threat to yield performance in terms of quantity and quality.

The Peeters brothers have implemented a bundle of measures to minimize the risk of harvest losses. This begins with giving the crops a healthy start by protecting them from pests and diseases. However, this process does not end with harvesting. Best storage practices are critical in order to minimize losses.

Precision farming – decision support

There are myriad tools on the market, but which ones are really effective? Precision farming is not just about collecting as much data as possible, it is about using the right data at the right time. Therefore, Jan and Josse Peeters have to find tools that really improve their decision making. The Peeters brothers installed GPS on two tractors and set up a weather station on the farm, which sends out warning signals if weather conditions imply an increased risk for disease. As a result, they do not miss upcoming threats and spray against infectious agents only when truly necessary.

The results speak for themselves. GPS-supported spraying and planting has enabled the The Peeters brothers to reduce the overlap by almost three percent which equals 44 fewer hectares of crop protection application during one year. The GPS-supported spraying also considerably reduces the amount of fertilizer, seed and fuel used.

“We have to master a lot of challenges: changing weather conditions, yield killers like pests and diseases and soil erosion. Moreover, consumers are becoming more and more concerned about food security and the environment. But yes, in conjunction with Bayer ForwardFarming, we seek to address these concerns”!

Josse Peeters, Hof ten Bosch

“We are blessed with good soil”

“...and we want to keep it that way,” Josse Peeters says. “Therefore, we have to manage our sandy loam soil with care, especially in the hilly areas of our farm.”

Normally, rainfall at Hof ten Bosch is quite moderate. But heavy downpours occur more and more frequently. The Peeters brothers noticed with concern that this rain caused significant runoffs of sediment and loss of yields in the potato crops. Since 2012, they have started to tackle the challenge of erosion by setting up in-field trials with the installation of perpendicular micro-dams as anti-erosion barriers.

Tangible results

Since using this method, the Peeters brothers have seen increased water retention and a 90 percent reduction in surface erosion compared to untreated fields. The farm has also achieved an additional yield of about three tons per hectare – a 5–6 percent increase. As a result of this success, the Peeters brothers have decided to apply the micro-dam system across their entire potato acreage.



Water The source of all life

Water is one of our most valuable resources. In fact, only three percent of the earth’s water is fresh. Using and preserving it in a responsible manner is in the farmer’s and the environment’s best interest.

Water is used on farms in many ways. In many regions, irrigation is essential to grow crops. Water is also used in other farm activities such as the cleaning of sprayers and other machinery.

Sprayers have a number of sensitive parts that need to be well maintained. Washing the spraying equipment after use is therefore important. While doing so, traces of crop protection products can contaminate the rinsing water. But how do we keep the rinsing water from getting into the drainage?

In 2012, the Peeters brothers installed a bioremediation system called Phytobac® to purify rinsing and washing water from treatment equipment.

Phytobac® is a simple way to prevent contamination of water bodies with washing water. For that the machinery is washed on a concrete platform where the waste water is collected in a waste water tank. It is then distributed via nozzles over a basin filled with a soil-straw substrate. Microorganisms in this soil-straw substrate biodegrade the residues, then clean water evaporates.

“Water is vital to agriculture. And it is limited. That is why we have to handle it with great care”

Jan Peeters, Hof ten Bosch



A B&B for bees

Wherever new agricultural land is created, natural habitats are lost. The area of arable land today covers about three percent of earth's surface. However, this arable land is urgently needed to feed the growing world population. At Hof ten Bosch, the Peeters brothers try to provide as much natural habitat as possible.

It goes without saying that Jan and Josse Peeters follow the EU-guidance by dedicating five percent of their arable land to ecologically beneficial elements, also called ecological focus areas. According to Belgian legislation, a minimum of two measures are required to be carried out on each farm to increase biodiversity.

But Jan and Josse Peeters go beyond that:

- Mixed plant hedges act as a windshield for fruit crops and help prevent spray drift.
- Flowering strips and mixed hedges ensure that bee pollinators and beneficial insects have food throughout the year.
- Nesting boxes are provided for small birds and resting places for predatory birds.

- Insect traps are used to facilitate monitoring of pest levels.
- Pheromone dispensers are installed to confuse breeding of fruit moths.
- Bee hotels are established along the edges of the fields.

As a result, biodiversity on the farm is increased and pest control is optimized through integrated pest management. The bee hotels are very well accepted by the pollinators.

The Peeters brothers also established three bee hives and were able to harvest 105 kilograms of blossom honey in 2019. They filled it into little glasses and gave one as a gift to each visitor of their farm.

"We are so pleased with our bees. They work hard on our farm!"

Josse Peeters, Hof ten Bosch



Safety first

Farming that is safe for farmers, their employees and the environment is at the heart of sustainable agriculture. Ensuring the responsible handling and application of products is an essential part of farming safety. By partnering with Bayer, farmers are able to learn and adopt best practices to keep themselves safe and continue to produce healthy food.

The Peeters brothers have always been very aware of their responsibility for the safety of their produce as well as for the well-being of the operator. So of course they follow the label instructions for the use of plant protection products meticulously.

Additionally, wearing the proper personal protective clothing is an essential part of good agricultural practice. For farmer support, Bayer provides an online tool called BAYER DRESSCODE with information about personal protection.

Bayer has also developed a new closed system device called easyFlow® that is being used on the farm. This device allows operators to measure and translocate crop protection products without being exposed to them.



Partnering to move farming forward

Bayer ForwardFarms are connected to a network of international and local cooperation partners. The importance of these partnerships is highlighted through our work with the University of Ghent in Belgium. Its scientists and Bayer have jointly launched the ForwardFarming Lecture Chair with two major focuses: precision farming and biodiversity.

Weather, soil, plant variety, diseases, crop protection products – numerous factors affect the quality of the harvest and biodiversity. The chair aims to help farmers make the right choices for themselves and the environment by converting the latest scientific evidence into tangible recommendations.



Dean Prof. Marc Van Meirvenne

Why does the University of Ghent join such a collaboration? What are the benefits?

The collaboration gives Ghent University the possibility to implement its ground-breaking findings on an operational farm. This means that our proposals for sustainable solutions must be ready for use and have an economical benefit. It will be a great learning opportunity for the farmer, but also for our scientists and students.

What do you think about an initiative like Bayer ForwardFarming?

Bayer ForwardFarming aims to increase the exchange of agricultural know-how, highlights improvements in sustainable agriculture and facilitates communication between farmers and other stakeholders. Ghent University supports that initiative and is pleased to contribute in settings where dialogue and independence of research is imperative.

What is the partnership between you and Bayer ForwardFarming about?

This endowed chair supports the common goal of Ghent University and Bayer to make innovative research directly accessible for the farmer. Delivering knowledge in a proactive and constructive manner will increase the uptake of new sustainable alternatives by the farmer which will help him to meet the economical, ecological and social challenges of today's agriculture.

What is the University's vision on sustainable agriculture? How do you see agriculture in 2050?

Meeting the global demand for food, fibre and fuel is a key challenge for agriculture in the twenty-first century. The Ghent Faculty of Bioscience Engineering investigates how to address this challenge by developing an understanding of the complex biological, physical and social-economic factors that shape agricultural systems. Research includes soil science, genetics, cropping systems, environmental interaction, livestock production and economics applied to agriculture. We provide modern agricultural tools and technologies that help farmers to feed a growing population, and to look after our planet.

Moving forward with innovation

As long as there's been agriculture, there's been agricultural innovation. From crop rotations and field terracing to the invention of the tractor, innovations big and small have brought agriculture to where it is today. ForwardFarms like Hof ten Bosch are places where the best of modern, regional agricultural innovations are combined to ensure that a farm is positioned to thrive for generations to come. Through a combination of holistic, innovative farming practices, the Peeters brothers have consistently produced impressive yields of 45–50 tons/ha of high quality potatoes year over year, while keeping on-farm storage losses to a minimum each month.

Among others, the Peeters brothers rely on the following cutting edge and time-tested practices, to drive Hof ten Bosch forward:

- Crop protection and integrated solutions that combine chemical and biological products to protect crop yield and quality.
- Decision support tools that make use of the latest information on weather conditions, research findings, as well as disease and pest management to ensure that important decisions are met with all available data.
- Cross-border techniques like planting and ridging, as well as new tools like anti-drift nozzles, which reduce surface erosion and drift.
- GPS navigation in tractors which enable planting, fertilizing and spraying activities to realize a four percent savings in the use of fertilizers and crop protection products.

These practices, in addition to other innovative developments like Phytobac® technology (see page 9), represent significant steps toward driving agriculture forward. Taken together, these developments position farms like Hof ten Bosch as forerunners in sustainable, modern agriculture. The United Nation's 2030 Sustainable Development Goals specifically target sustainable food production as a goal for the coming years. Farms like Hof ten Bosch will be essential to meet this ambitious, but feasible goal.

Bayer ForwardFarming is proud to partner with farms like Hof ten Bosch, which remain at the forefront of agricultural innovation.



Sustainable Agriculture in practice

Bayer ForwardFarming provides an up-close look at how farmers are practicing modern and climate-smart sustainable agriculture around the world. Unique in its global reach the Bayer ForwardFarming network serves as platform for knowledge sharing and dialogue. ForwardFarmers deploy technologies and best practices to improve productivity, reduce agriculture-related greenhouse gas emissions, decrease the environmental impact of crop protection, promote biodiversity and conserve natural resources.

On the ForwardFarms, progress towards the Crop Science sustainability commitments truly comes to life.

Bayer ForwardFarming demonstrates solutions that support sustainability in agriculture across the following three components:

// **Care for Crops** – Every farm is different, and every field within a successful farming operation is unique. **Tailored Solutions** are needed to meet the needs of the individual farmer and their specific field – from the right seeds and traits to the correct type and amount of crop protection, to the digital tools and services that allow for good decision making and precision.

// **Care for the Planet and People** – Bayer ForwardFarming promotes and demonstrates **Proactive Stewardship** to protect human health and preserve the environment. Examples include addressing the safe and responsible use of crop protection products; soil health, biodiversity, and water conservation; and offering training in all of these areas.

// **Care for Partnerships** – Bayer ForwardFarming fosters **Partnerships** with value chain actors, research centers, universities, and other institutions to strengthen sustainable farming development.

For further information, visit our website:

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SBS-19-1047

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