

# One Step Ahead with Sustainable Agriculture

Wasmayr Hof – Germany



Bayer  
Forward ►►  
Farming



## We have *deep roots in the region*

The history of farmers working the land in the valley of the Pfettrach river can be traced back to the fifteenth century. Even today, historical buildings still bear witness to a lively milling industry along the banks of the Pfettrach, which points to a long history of farming in this area. The Wasmayr Hof was first documentarily mentioned in 1465.

A good 40 years ago, the Gebendorfer family took over the Wasmayr Hof. Josef Gebendorfer initially focused on dairy farming, but the family gave up their livestock in 2011. Today, Josef Gebendorfer and his son Martin farm 40 hectares as a sideline business. Thanks to the machinery cooperative they have with their neighbors, they can make optimum use of their resources. The Hotel Wasmayr Hof provides an additional and important source of income. Guests appreciate the special atmosphere which has been created by tastefully combining old and con-

temporary elements. Today, the sideline farming business and the hotel provide a livelihood for four generations.

“Our biggest asset is still our soil. By farming our land sustainably, we can safeguard our yields and protect the overall profitability of our business,” says Josef Gebendorfer, the senior manager of the farm. However, he is also aware of public concerns about modern agriculture. “Nowadays, very few people really understand agriculture,” adds his son Martin. Consequently, the father-and-son team and the entire family want to invite interested individuals onto their farm and show them how agriculture works.

For more than 15 years now, farmers from the region have been visiting Wasmayr Hof in Aich on a regular basis, and the farm has made some of its land available for the Bayer Advice Center. “This has given rise to collaboration

based on trust,” explains Josef Gebendorfer. “We really liked the idea of working together with Bayer to put future-oriented sustainable concepts into practice in every respect as part of the ‘ForwardFarming’ initiative.” Martin, who will one day take over the farm, is ready to play his part in continuing to shape this future.



*“Our biggest asset is still our soil. By farming our land sustainably, we can safeguard our yields and protect the overall profitability of our business.”*

Josef Gebendorfer, Senior Manager, Wasmayr Hof



# Sustainable farming at Wasmayr Hof



## Farm profile



### Location:

Altdorf, Aich, Lower Bavaria. In the valley of the Pfettrach, a tributary of the Isar river.



### History:

The farm, with first official mention in 1465, was taken over by the Gebendorfer family in 1982. Traditional dairy farming activities were given up in 2011 and in 2013, a hotel arose in the former stables.



### Farming Land:

Tertiary hilly area with sandy loam and loess in the lower regions and rather poor soil quality in the higher regions, with a rating between 60 and 80.



### Crops:

Winter wheat, winter barley, winter canola, grain maize.



### Partners:

Collaboration with other farms, beekeepers, local agricultural trader and weather service.

## Key elements



### Seeds

High-quality, certified seed forms the foundation for optimal yield.



### Bayer SeedGrowth®

Protecting seeds from diseases and improving stress tolerance.



### Integrated crop protection

Targeted crop protection based on the economic threshold principle protects crops from pests and diseases.



### Weather station

Detailed weather forecast information enables optimized and targeted use of crop protection products.



### Digital solutions

Assisting the farmer in making the right decisions to optimize cultivation methods and protect resources.



### Soil health and erosion prevention

For years, the farm has been using cover crops and tillage methods to minimize soil erosion and maximize water protection.



### Flower strips and flower meadows

Flower strips are planted in favorable locations and boost native flora and fauna, especially as a source of food and habitat for insects and birds.



### Bee houses, beetle banks and earth piles

These measures offer vital breeding grounds for wild bees in particular, but also for other pollinators and insects.



### Skylark plots and nesting boxes

Strategically placed open plots in crop fields provide skylarks safe places to land and nest. It also benefits hares.



### Phytobac® and water protection

Areas covered with grass all year round along the course of the river protect against undesirable runoff of crop protection products. The installation of a Phytobac® is planned to prevent point source pollution.



### Safe storage and safe use of crop protection products

Crop protection products are stored safely in a suitable storage facility. The correct personal protective equipment and closed transfer system easyFlow M provide protection for both the user and the environment.



### Partnerships

Combining the expertise of various players to jointly master the challenges of sustainable agriculture.



## Key focus on *integrated farming*

Wasmayr Hof uses a five-field crop rotation system, with grain maize, baking-quality wheat, winter barley, oilseed rape and cover crops. Together with relevant crop cultivation measures, the crops complement one another in terms of both soil fertility and crop protection. To ensure the crops receive a balanced supply of nutrients, fertilization takes place on a needs-driven basis. These needs are identified by analyzing the soil and its nutrients to prevent nutrient loss and provide the crops with exactly the nutrition they need while simultaneously protecting the ecosystem. Liquid manure is also used as a natural, organic fertilizer. As well as providing the crops with nutrients, liquid manure also promotes soil life and, along with the cover crops, supports the formation of humus.

### *Regionally produced, certified seeds as the basis of successful cultivation*

Regardless of whether the harvest is destined for animal feed or for the production of foodstuffs for human consumption, the farm managers consider top-quality seeds to be an absolute priority. Breeding progress with a wide range of varieties enables site-specific variety selection adapted to climate change. The Gebendorfers attach particular importance to sturdy varieties with healthy leaves and a high yield. When it comes to wheat, they also prefer protein-rich varieties, as these will produce baked goods of excellent quality.

“Treated Z-certified seeds are the best you can get. The quality and health of a harvest starts right at the sowing stage.” As far as Josef Gebendorfer is concerned, there is simply no other option. “When choosing the varieties we want, we also look for resilience. Good soils call for more sophisticated varieties. Precipitation is usually not a limiting factor for us, so we always

go for optimum yield when selecting seeds. Seeds that have been propagated in the region meet our requirements perfectly, since they are ‘accustomed’ to cultivation under local conditions. Seeds are selected in close cooperation with agricultural suppliers and based on the insights provided by trials of different varieties. However, seed companies such as Bayer also provide valuable recommendations. There is a difference between the varieties planted in poorer soil and those sown in good-quality soil.”

It is important to protect high-quality seed against diseases from the very beginning by treating it. Seed treatment has the advantage of requiring only small amounts of active ingredient and fewer large-scale spray treatments.

### *Seed treatment*

“As far as I’m concerned, seed treatment is quite simply the most effective and at the same time the safest protection available for the environment. Year after year, the biggest investment we make is in our seed, so treating it to protect it is really important to ensure the investment pays off. However, the profitability of canola crops has been in jeopardy ever since we have been unable to use neonicotinoid seed treatment. We are now trying to protect these crops with targeted applications, but with limited success.”

Innovative biostimulants that stimulate root activity may help to offset this. Canola is a very effective forecrop, so it needs to keep its established place in the cultivation plan, especially since it also provides a wonderful feeding ground for bees when it is in bloom. “If canola loses out, then we all lose out,” he concludes.

*“When choosing the varieties we want, we also look for resilience. Good soils call for more sophisticated varieties.”*

Josef Gebendorfer, Senior Manager, Wasmayr Hof



Sown maize



## Crop protection in moderation – for the sake of the environment

Integrated crop protection is the approach taken at Wasmayr Hof. Crop rotation, soil cultivation measures and cover crop cultivation all have an important role to play by minimizing weed pressure. When using herbicides, care is taken to use a range of products with different mechanisms of action, as this helps to prevent resistance from developing.

Thanks to new technologies, it will soon be possible to treat fields in a more variable way, with the treatment being specifically adapted to weed density, thus further optimizing use of these products.



Rape blossom beetle



Ears of wheat affected by fungus (*Fusarium* spp.)

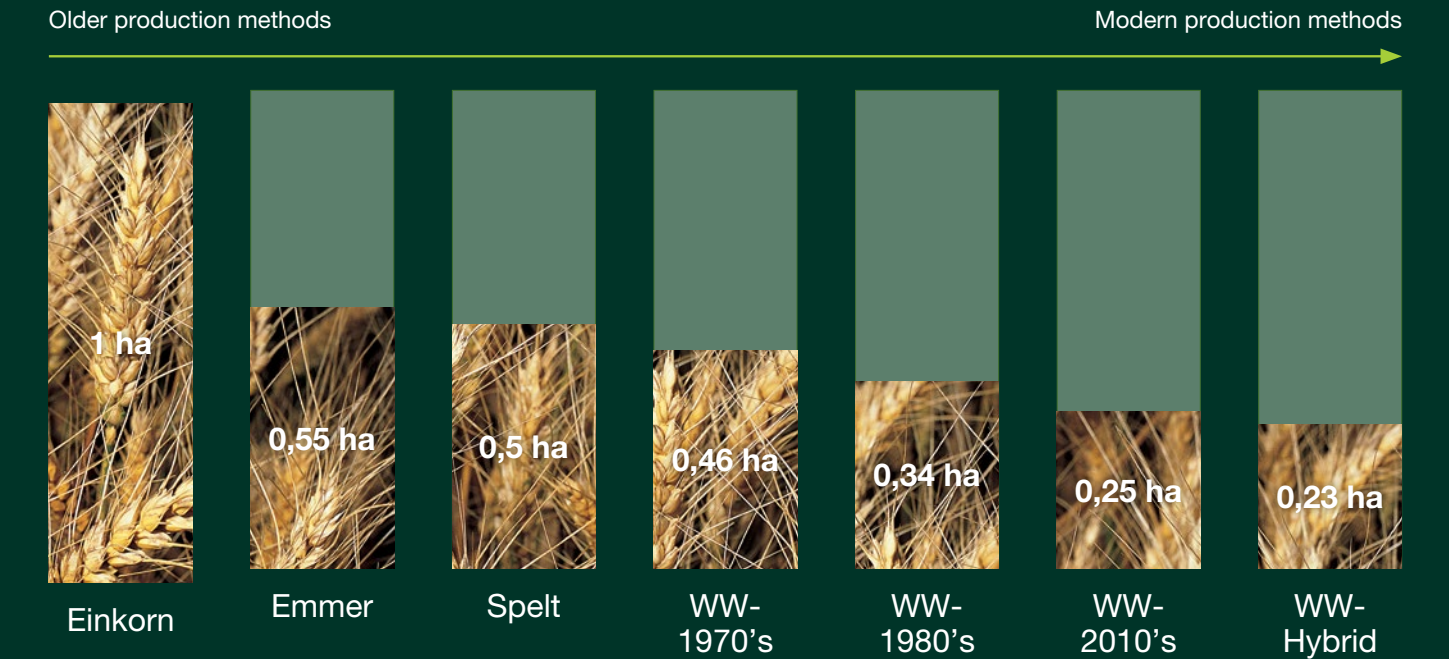
Integrated protection against plant diseases and pests also involves incorporating advice from the official crop protection organization and infestation forecasts into the crop protection strategies. The Bayer advice service is also consulted. Insecticides and fungicides are only applied in accordance with the damage threshold principle. The selection of varieties supports the crop protection measures, since the crop protection product outlay can be optimized by choosing varieties that are resistant to diseases and stress, without putting either yields or quality at risk. Nevertheless, the most important measure for securing yield and ensuring quality, especially in the case of cereals, is still the final treatment of the ears of the crop against serious fungal infections such as rust or *Fusarium* fungi.

Continuous observation, e.g. by using digital traps, also continues to be important, as this enables the early detection of pest infestations so that measures to combat them can be put in place in good time. This is a common occurrence in case of canola, for example, which is often put at risk by pests such as the rape winter stem weevil or the rape blossom beetle. In the case of corn, weed control is the most important measure for securing yields.



## Cereal production Past versus present

Arable land required for approx. 4,500 kg\* of bread  
Depending on cereal variety/breeding progress/modern/sustainable production



Area required for production of 4.5t bread (2.5t grain)

Area freed up for other crops or to encourage biodiversity

\*Assumption: 1 kg of wheat bread requires 0.550 kg of wheat (*Food Monitor, information service for nutrition*)

Thanks to progress in breeding and the use of modern resources, the same amount of "bread" can be "grown" or "produced" on less and less land.





### Working with the weather – not against it

Detailed findings gleaned from weather data enable targeted crop protection with optimum effect. Wasmayr Hof acquires these data from its own weather station. The weather data recorded, collected and analyzed here is available to the farm managers in real time. This location-based weather monitoring enables reliable infestation forecasts, and these forecasts can then be used to plan crop protection measures. The farmers also use the weather service provided by the hail insurer Vereinigte Hagel in conjunction with the weather forecaster Kachelmann-Wetter. This provides the farm managers with detailed insights into all weather conditions, meaning they can make well-informed decisions about weather-dependent measures at all times.

“Data relating to air humidity, wind speeds or temperatures are a huge help to us when we are planning our crop protection measures within the context of integrated crop protection and deciding exactly when we are going to put these measures into place. If, for example, air humidity is too high or the wind is too strong, our sprayer remains in the yard.” Martin Gebendorfer also finds the tool useful when he is out working in the fields, as it allows him to monitor changes in the microclimate in real time and respond to them as needed.

### Spot on

The farm managers attach huge importance to innovative technology in their sideline business. They have invested in a cutting-edge crop protection sprayer with permanent internal cleaning and an automatic cleaning system. Moreover, the equipment features the very latest technology – the full range of the latest nozzle technology is available, meaning that the crop protection product can be applied exactly where it is needed and drift can be avoided. The Dropleg system – an extra-long set of nozzles – can be retrofitted and insecticides can then be applied to the crop in a way that helps to protect beneficial insects.



Anti-Drift nozzles



Dropleg nozzle





## Reducing greenhouse gases

Agriculture can play an important role in curbing greenhouse gas emissions such as carbon dioxide, methane and nitrogen oxide. Less tillage and less use of vehicles on the fields, i.e. thanks in part to better solutions for weed control, reduce the use of fossil fuels. If soil is tilled as little as possible, it can store carbon, nutrients and water longer. Digital methods and precision agriculture help farmers to use crop protection products and fertilizers more efficiently. Satellites and drones supply real-time images of the current vegetation and play a part in the implementation of smart solutions. The use of microbes to improve the availability of nutrients and water is also being pioneered. These solutions make it possible to improve yield without having to further expand the areas of cultivated land in response to increasing demand. This means that other parts of the land are available as protected areas for pollinators or other animals. In short, considerable value is added. Bayer's commitment to work closely with growers to reduce field greenhouse gas emissions by 30 % in the most emitting cropping systems by 2030 places a heavy emphasis on these developments. With this target in mind, Bayer launched its decarbonization program in Europe in 2021. The aim of the program is to systematically reduce and offset CO<sub>2</sub> emissions in

the agricultural value chain by establishing carbon farming, thereby helping to fight climate change.



## Only the best for the soil

**For years, the farm has relied on cover crops and soil-conserving tillage methods to protect against erosion and to protect water.**

The farm managers implement measures to protect against erosion, both as part of the greening strategy and for other reasons too. The five-field crop rotation system is key here. This rotation is designed to ensure that almost all arable land is protected against erosion with a vegetation cover at all times of the year. Three of four crops – namely wheat, barley and canola – are winter crops and thus ensure vegetation from autumn to the following summer. Before the summer crop maize (after the winter barley), a cover crop is always sown without plowing. The farm managers also use compact disc and rotary harrows to prepare the maize seedbed. Plowing only takes place once the maize has been harvested. This is primarily for phytosanitary reasons, as it means that crop residues, to which pathogens may be attached, are not left lying on the surface of the field and rot more quickly. Tractors are also fitted with Terra tires to protect the soil. Last but not least, moderate use of liquid manure as a fertilizer has a positive impact on soil life.

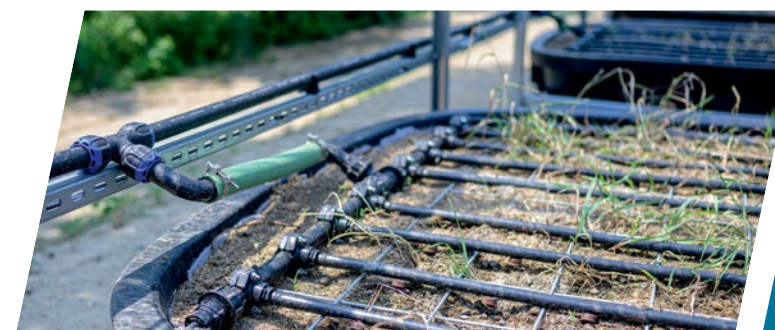
Increased humus formation and reduced greenhouse gas emissions have become much more important in recent years as global warming has increased. It is with this in mind that the team at Wasmayr Hof has introduced all these measures and has therefore already taken important steps in the right direction.



## Grassland protects against water pollution

At Wasmayr Hof, protection against water pollution is not left to chance. The dedicated farm managers employ a sophisticated grassland management strategy that makes use of the natural conditions. For example, grasslands close to the river acts as buffer strips and these play an important role in water protection. The grasslands are mowed by another farmer, who uses the silaged grass to feed his cattle. All in all, the extensively used grassland also contributes to the biodiversity of the entire farm.

Point source pollution, which can occur when cleaning spraying equipment, is to be greatly reduced in the future by using a Phytobac® system. This solution, which was developed by the Dutch company Beutech Agro, ensures that crop protection product residues are degraded biologically. The Phytobac® system uses the same microorganisms that are found in the fields directly in the farm-yard, where the sprayer is cleaned with a high-pressure washer.



### How the Phytobac® system works

First of all, the cleaning water runs from the washing platform into a collecting tank. From there, it trickles in carefully metered quantities into basins filled with arable soil and chopped straw. Here, the natural organisms in the soil break down residues of fungicides, herbicides and insecticides, while the cleaned water evaporates. The chopped straw promotes microbial degradation.





# Biodiversity

Climate change and the decline of species are two of the major challenges of our age. Although the agricultural industry causes problems, it is to a much greater extent a problem solver. ForwardFarming provides practical examples of how modern agriculture and biodiversity can be excellently combined.

## A paradise for insects

Protecting pollinators on agricultural land is a major challenge. At Wasmayr Hof, insects are given the habitat they need to settle permanently at the farm. For example, annual and perennial flower strips are incorporated into the individual crops and crop rotations. They serve as a habitat and source of food, not just for insects but also for birds. Beekeepers and their bee colonies value the diversity of flower species as an important source of honey yield.

## Space for rare species

Not only hardworking honey bees or colorful butterflies are supported on the Wasmayr Hof. Bee hotels, earth piles and beetle banks provide the protection particularly needed by more inconspicuous members of their species. Wild bees and other rare pollinators and insects, as well as beetles and spiders, are provided with vital breeding grounds and places to overwinter. Conservation experts monitor the measures being taken and evaluate their success.

*“For us, for example, the bird protection association Landesbund für Vogelschutz or the Beekeepers Association are indispensable contacts.”*

**Josef Gebendorfer,  
Senior Manager, Wasmayr Hof**



## Places to land and nest

Some of the bird species native to areas being farmed are endangered. On the one hand, they need the farmed areas for their nesting grounds but, on the other hand, farmed land offers little in the way of small-scale habitats. A skylark plot is the easiest way to provide refuge to rare ground-nesting birds.

Strategically placed seed gaps help skylarks and other species such as partridges to land safely and nest in the fields. Even hares benefit from skylark plots. Perches for birds of prey are often already an integral part of ecologically enhanced areas. This way, regular nesting grounds can be established, even in intensively used agricultural areas.



Beetle bank







# Protection you can rely on

Martin and Josef Gebendorfer attach great importance to user protection and to looking after their own health too. Bayer supports operations by providing personal protective equipment. In cooperation with the insurance association responsible for agriculture (Social Insurance for Agriculture, Forestry and Horticulture, SVLFG), for example, Bayer has developed a special back-fastening protective suit. It is made from a material that meets all the requirements applicable to protective suits for working with crop protection products. However, it is much more comfortable to wear than conventional products and is also very easy to put on and take off. This is just one of the solutions showcased in the Bayer advice center, where other assistance relating to user protection is provided.

## Safe use

Nowadays, there are already strict rules in place for all farms to ensure that crop protection products are stored safely. These rules are designed to prevent environmental pollution. At Wasmayr Hof, further improvements are being made to the existing storage facility for crop protection products.

As far as the technical side is concerned, the closed easyFlow M system is used. Thanks to this closed system for transferring liquid crop protection products out of sealed or open canisters, products can be wholly or partly transferred safely and the device can be cleaned in the closed system. Not a single drop is lost.

The farm managers dispose of the empty canisters at special collection points provided by the industry and agricultural suppliers.

*“Bayer takes a holistic approach to protection. Next to environmental and water protection, user protection also plays an important role.”*

**Karl Eschenbacher,  
Head of Bayer ForwardFarming**

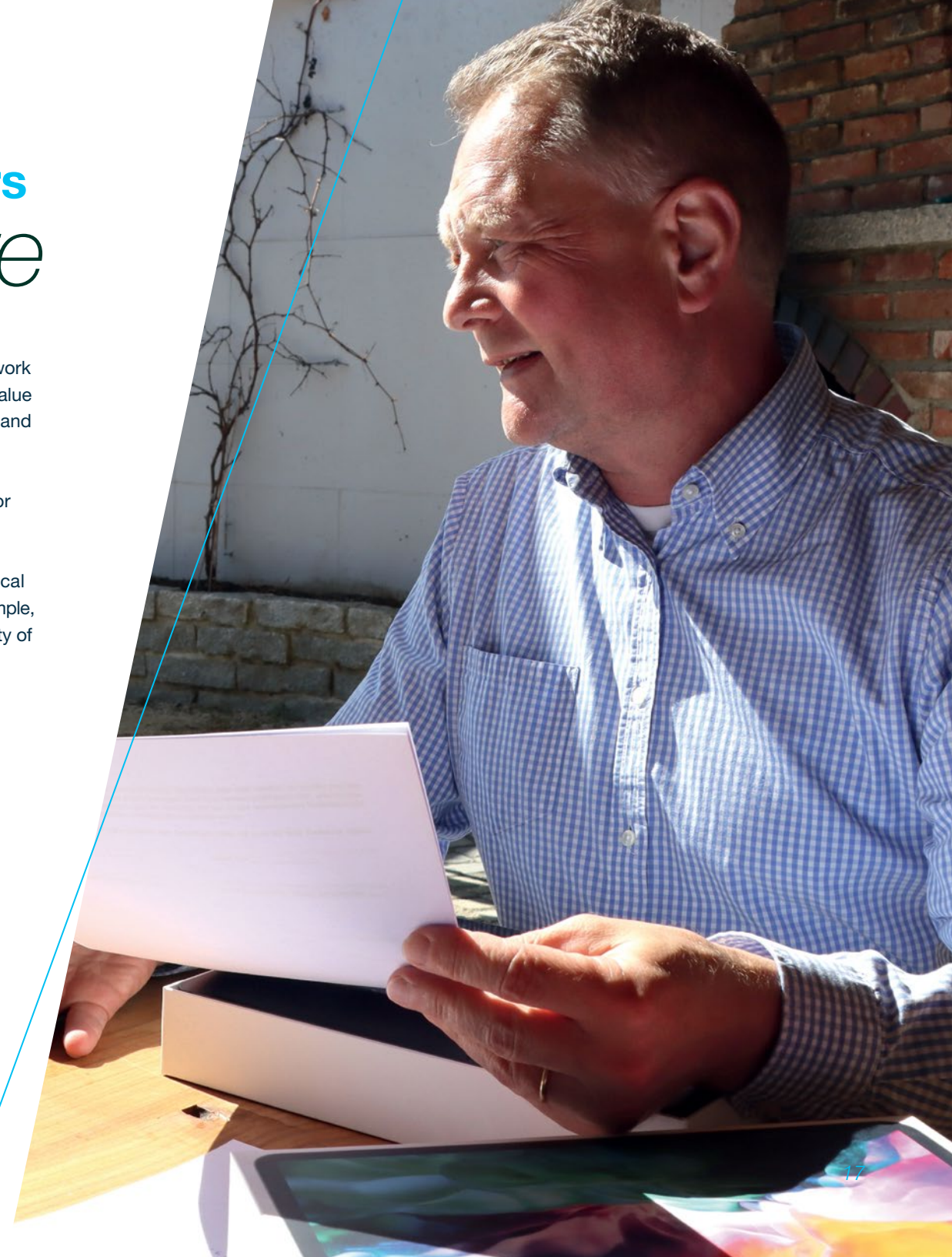


# Working with strong partners to shape the future

Like all other ForwardFarms, ForwardFarm Wasmayr Hof is part of a network of competent partners. The network includes experts from science, the value chain and civil society, who all have an interest in sustainable agriculture and contribute to it in their individual way.

Bayer, with its advice center which has been located at Wasmayr Hof for 15 years now, is a strong partner in this regard.

“However, it is really important to us that we work in partnership with local associations and organizations too,” the farm managers point out. “For example, the Landesbund für Vogelschutz (Bird Protection Association) or the Society of Beekeepers are vital contacts for us.”



## Reducing environmental impact

Adopting a responsible approach and developing innovative technologies such as digital agriculture, new crop protection tools, precision applications and crop cultivation tools ensures that crop protection products are used with complete precision, thus reducing their impact on the environment. In close cooperation with growers, Bayer is committed to reducing the environmental impact of crop protection products.







## The digital view of *the field*

The digital age has reached Aich too. “Even though we are sideline farmers, we still attach great importance to precision,” says Martin Gebendorfer. “Around half of all German farms are run as sideline businesses. Together, they cultivate almost 18 percent of agricultural land in Germany and it is really important that innovative developments do not pass them by.”

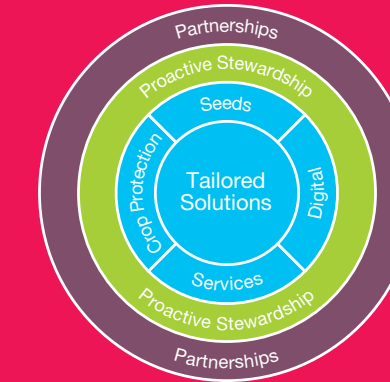
At Wasmayr Hof, two tractors and the cutting-edge crop protection sprayer are fitted with GPS and special nozzles for applying the crop protection products in a way that minimizes drift. This represents the first important step towards precision agriculture. The field records are currently being digitized, as this is a prerequisite for using Climate FieldView™ applications.

FieldView™ helps farmers to gain a deeper understanding of their fields at all times of the year, and to make more objective, data-driven decisions, which have a direct impact on both the agricultural and economic yield.

FieldView™ analyzes the yield performance of the crops and farmers have faster access to technical findings regarding their crops. This provides direct insight into the processes being carried out on every field. FieldView™ also supplies satellite images and these, together with the field data, form

the basis for smart decisions and future crop management. This means that each farm can create its own, customized crop management plan that takes field variability, such as in relation to seed management with variable seeding charts, into account. These detailed field insights also mean that resources can be put to optimum use, including in the areas of fertilization and crop protection.

“FieldView™ means that, in principle, each farmer can establish their customized demo with corresponding experimental set-ups on their own fields. What’s more, this is not just related to crops or varieties, but is also based on differentiation in the management of a field tramline, partial area or soil type.”  
*Tilman H. Puls – Climate Field Product Specialist.*



## Bayer ForwardFarming makes sustainability tangible

*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:

[www.forwardfarming.com](http://www.forwardfarming.com)

Follow us on social media:



Bayer CropScience Deutschland  
#ForwardFarming



Bayer4Crops  
#ForwardFarming



bayercropscience\_deutschland  
#ForwardFarming



#### Contact

*Bayer CropScience  
Deutschland GmbH*  
Alfred-Nobel-Str. 50  
40789 Monheim am Rhein  
Germany

*Julia Köbele*  
Bayer ForwardFarming  
+49 (0) 175 30 17 992  
[julia.koebele@bayer.com](mailto:julia.koebele@bayer.com)

[www.agrar.bayer.de](http://www.agrar.bayer.de)  
[www.forwardfarming.com](http://www.forwardfarming.com)

© 2022 Bayer AG  
SBS-21-1115

#### Farm

*Wasmayr Hof  
Martin and Josef  
Gebendorfer*  
Aich 4  
84032 Altdorf  
Germany