

Practice PF n° 7

USE OF THE ONLINE INFORMATION PLATFORM WATCHITGROW TO GENERATE TASK MAPS FOR VARIABLE FERTILISER APPLICATIONS

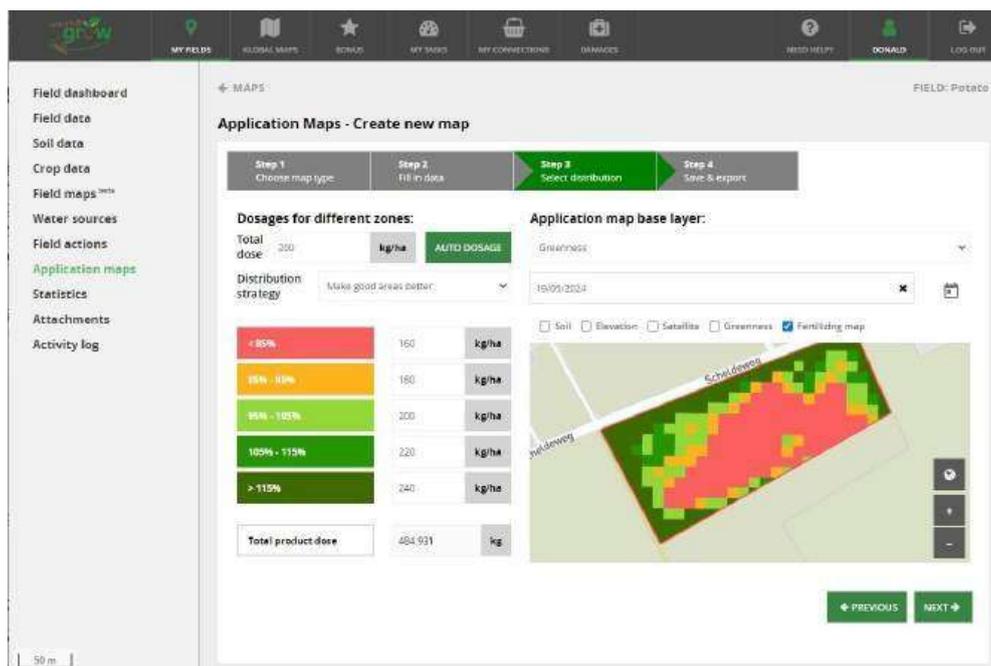
Introduction

Category: Good Practice (GP)

Practice identity card

#Online data platform, variable rate fertilizer maps

#PF, Food, Feed, Fibre, Oil, Industrial, GP, Belgium



Short description

- ➔ WatchItGrow is an online platform to support farmers in monitoring arable crops and vegetables more efficiently in view of increasing yields, both qualitatively and quantitatively. It is a collaboration platform for everyone in the sector, from growers, contractors and advisors to buyers.
- ➔ WatchItGrow uses various types of data starting with satellite data combined with e.g. weather data, soil data, IoT data and field data provided by the farmer. These data are combined using new technologies such as big data analytics and machine learning to provide farmers with more timely and personalized advice. The platform offers numerous functions. It can be used to store field data: general information such as the variety, planting date, harvest date or more specific information on

application of fertilizers, pesticides, irrigation...As a farmer you decide whether or not you share these data with your advisor, contractor, buyer...

- ➔ WatchITgrow provides information on crop growth and development as observed from satellite images. From the greenness maps you can easily detect variability within your field and compare crops growing on different fields. By monitoring the weather data (temperature and rainfall) you can better assess the risk for production or quality losses at your fields. WatchITgrow also provides yield forecasts for 2 potato varieties, Bintje and Fontane, at field level. Finally, application maps for variable rate planting, irrigation, haulm killing and variable fertilization can be created.
- ➔ To create an application map for variable rate fertilization, different steps are followed. In the first step, the farmer selects the machine that will be used for fertilizing, the type of fertilizer (mineral, organic, compost) and the product(s) that will be applied. You can select one or more products from the list of existing (mineral) fertilizers or you can create your own product. If you choose the latter option, you can add minerals one by one. When adding the product, you are also asked to add the normal dose you would apply to the field, in kg/ha or l/ha. In step 2, by clicking on “Auto dosage”, the normal product dose is distributed over the different zones within the field according to the selected strategy. “Make bad areas better” applies a higher dose of fertilizer to zones with a low greenness index. When you select “Make good areas better” a higher dose will be applied to zones with a high greenness index. If needed, you can still change the dose.
- ➔ To define the zones WatchITgrow uses greenness (fAPAR) images derived from Sentinel-2 satellite images. The Fraction of Absorbed Photosynthetically Active Radiation (fAPAR) is a vegetation indicator that quantifies the fraction of the solar radiation absorbed by live leaves for the photosynthesis activity. It measures only to the green and alive elements of the canopy.
- ➔ The greenness of each pixel in the field is compared with the median greenness of the field and attributed to one of the following 5 classes: <85%, 85-95%, 95-105%, 105-115%, >115% of the median value. In the last step you can enter the name of the application map and, optionally, an advice date for fertilizing. You can download the polygons and the respective fertilizer dose to be applied as a shapefile by clicking on the download button below or you can just save the map you created. These application maps can then be uploaded in the variable rate fertiliser technology.

Implementation process

Which practice is considered as the standard in this region? A uniform quantity of fertilizer is applied to the field, usually based on a soil sample analysis and advice at parcel level. Variation in soil quality/fertilizer need within the parcel is not taken into account.

What was the on-farm issue/challenge/opportunity that led to the implementation of the practice? In most agricultural fields, a natural variation in soil quality is observed, which is linked to the yield potential. If the farmer applies a uniform dose of fertilizer on the field, zones with an overdose or underdose will occur. This leads to a low efficiency in fertilizer use. The evolution towards precision agriculture allows this variation to be mapped and managed accordingly. WatchITgrow provides information on crop growth and development as observed from satellite images. From the greenness maps you can easily detect variability within your field and create application maps for variable rate.

How long did it take to implement the practice and which are the measures needed to monitor: The first version of the WatchITgrow platform was developed within the iPot research project in the period 2014-2016 and was launched in 2016 focusing the field and yield data in potato production. Since then and till today, the tool was continuously improved and expanded with additional crops and modules

including variable fertilization. To promote the use of the platform, Belgian potato farmers could receive a financial bonus from their buyer in 2019 and 2020 when they actively use the WatchITgrow platform to submit field data and actual yields. The platform can be used to monitor fields in Belgium and surrounding countries.

Logistics

- **Logistic aspects to consider:** It concerns a web-based tool that is freely accessible after registration. Internet access is required to use the platform. A connection with other data sources (e.g. weather stations, yield sensors on harvesters...) is possible, but not required. Applying fertilizer using task maps requires the use of machinery supporting variable rate application.
- **Other specific tools involved/included:** To apply the task maps, the farmer should have access to machines that support variable dosing. Or alternatively, a contractor can be called in for this purpose. Currently, most of the machinery fleet is not yet equipped with this technology. In addition, a learning curve will have to be gone through in order to start working with the task maps. For example, when loading the task maps, the correct file format and folder structure must be used, which can vary greatly from manufacturer to manufacturer.
- **Additional requirements for application:** Free account on WatchITgrow platform.
- **Skill/education level required:** rather high

Agronomical traits

- **Can the practice be applied to a multitude of cultivation techniques?** All types of manure and fertilizer in arable crops and vegetables.
- **Targeted crop categories:** feed, food, fibre, oil, industrial
- **Influence on soil quality:** Fertilisation is adjusted to differences in soil quality, so over-or under-fertilisation will be limited.
- **Suitable soil types:** peaty, sandy, clay, loamy, chalky, silty
- **Expected effect on crop yield:** increase
- **Expected effect on crop yield variation:** decrease
- **Expected effect on crop quality:** increase
- **Expected effect on crop quality variation:** decrease
- **Which costs may increase due to the practice?** skilled labour, equipment, internet / data subscription costs
- **Which costs may decrease due to the practice?** fertilizers
- **Expected long-term/indirect economic benefits of the practice:** Higher sustainability of the crop production due to higher yields/lower input of fertilizer.
- **Expected effect on the leaching of nutrients:** Nitrogen: decrease
 - Phosphate: decrease
 - Potassium: decrease
- **Specific materials applicated through the practice:** animal manure, compost

Administrative context

- **Does the practice qualify for subsidies?** No
- **Are there any policy barriers complicating the practice's application?** Data privacy and ownership policy.
- **Does the practice involve the use of hazardous substances?** No
- **Is the practice supported by Eco-schemes?** No
- **Are there any gaseous emissions to be considered upon application of the practice?** No

- **Greenhouse gas (GHG) reduction potential of the practice:** little or none
- **Expected effects from the practice on the time occupation of the farmer?** substantial increase
- **May the practice contribute to a better public image of agriculture?** Higher yield with lower input of fertilizer is expected, which will lead to a lower environmental footprint of the products. This sustainability is getting more attention from the consumer.
- **May the practice improve the farmer's self-image?** Farmers are proud to work with innovative technologies which contribute to a more sustainable agriculture.

Contact

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Eu member state: Belgium

Find out more

Source of information WatchITgrow platform (<https://watchitgrow.be/en>)