



Knowledge grows

# Yara Water Solution

Installation Guide



## Product summary:

- Included components
- Tools for setup
- Installation overview

## Step by step installation guide:

- Mounting the Base Station
- Preparing the field set up
- Installing Transmitters and Yara Water-Sensors in the field
- Installing the other sensors in the field
- Connection to MyYara
- How to manage your irrigation by using the MyYara account

## Annex

# Product summary

## - Included components

The standard kit is aimed at preparing your farm for crop water management and it includes all sensors and components to start monitoring one irrigation sector. The installation consists of three steps: mounting of the Base Station, installing the Transmitters and Yara Water-Sensors in the field and finally, registration in MyYara and setup of your farm for online monitoring. The standard kit contains the following items:

### Material to mount the Base Station:

1 Base Station including AC transformer and fixation pieces.



1 ISM antenna for receiving the signals of the Transmitter, including fixation pieces. Cable length ca. 5m. (The look of the component may vary by country)



1 Internet antenna for sending the signals to your MyYara account.



1 SIM card for data transmission to your MyYara account. **SIM card is activated and already inserted into the Base Station.**



1 license for data acquisition and connection to MyYara, valid for a period of 1 year from first activation (first clamping of the Yara Water-Sensors).



Additional items to adapt to some specific needs in a farm installation and other devices to expand the capabilities of the system are available for purchase. Check with your local dealer for the options available or visit our web page [www.yara.com/water](http://www.yara.com/water)

Figures and illustrations in this User Manual are provided for reference only and may differ from actual product appearance. Product design and specifications may be changed without notice.

### Material to install in the field:

10 Yara Water-Sensors to measure leaf turgor. Cable length ca. 2m.



1 Temperature-Sensor (red).



1 Humidity-Sensor (blue).



1 Soil Moisture-Sensor.  
Cable length ca. 6m.



5 Transmitters (1 Transmitter for a set of 2 Yara Water-Sensors. Batteries are included. Remember to insert the batteries before use).



1 Installation Device (Batteries and Installation Cable are included. Remember to insert the batteries before use).



### User manual and documentation on specific items



Make sure that you have received all items before starting installation.

Remember to insert the batteries into the Installation Device and the Transmitters. Batteries are included.

# Product summary

## - Tools for setup

You may require some or all of the following tools to make an installation:



**Crosstip screwdriver, optimum size PH2** - to insert batteries in the Transmitters and for fixation of items onto a pole or a wall.



**Spade or similar** - to install Soil Moisture-Sensor in the field.



**Drill** - if fixing the Base Station or antennas onto a wall. Screws and other fixation materials are included.



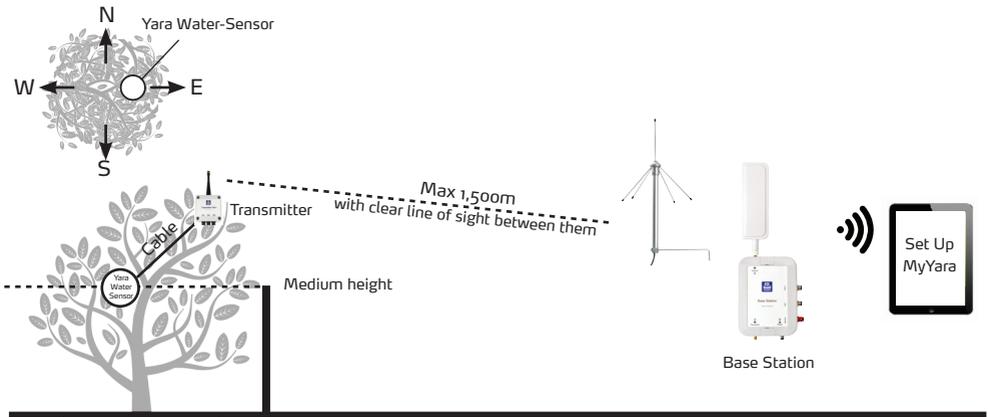
**Ladder** - may be needed to install the antennas and Transmitters if your trees are high. Fixation elements for antennas to a pole or onto a wall are included.



**Laptop or tablet** - to connect to MyYara.

# Product summary

## - Installation overview



The installation can be done at any time during the irrigation period, but preferably before high demand of water is required by the crop and early in the morning. In deciduous trees, leaves should be fully developed before installing the Yara Water-Sensors.

The standard kit is aimed at monitoring uniform irrigation plots up to 15 ha. Plots of bigger size may need extra equipment, please contact us for more details. If you want to monitor more plots you have to order an extension kit.

Choose 5 representative trees scattered all over the plot, these must be representative of the whole plot in size, vigor and health. Avoid:

- unhealthy trees
- trees bigger or smaller than the average of the plot
- the trees on the row sides

We recommend to plan your setup on a map of your field beforehand.

If your plot has different soils, install the Yara Water-Sensors in trees in the most representative areas.

Keep in mind that the distance from Transmitters to the Base Station should be maximum 1,500m (\*USA/Brazil version max. 500m) line of sight. Longer distances may be achieved by the use of a Repeater, not included in the standard kit. More information can be found in the Yara Water Solution User Manual.

2 Yara Water-Sensors will be connected per Transmitter in any of the 3 channels. The Temperature-Sensor, Humidity-Sensor and Soil Moisture-Sensor have to be connected in the free channel of 3 Transmitters (any channel and Transmitter are suitable).

# Step by step installation guide

## - Mounting the Base Station

The following instructions will guide you step-by-step to successfully install the Yara equipment. For further details on features of specific items, please review the User Manual.



A mobile network connection is needed - the system will not operate without a valid 2G or 3G mobile network connection. Make sure you have 2G or 3G available where you install the Base Station.



## Base Station

**The Base Station needs to be installed inside or outside, with a power supply nearby (solar energy system is available upon request), in a place with good 2G or 3G coverage, and so that the included ISM antenna has a clear line of sight to the Transmitters.**

- Fix the Base Station
  - with the included cable ties on a pole or



- remove the two pole mount brackets and the screws behind the lids to mount the device with the additional screws on a wall.



- Connect the Internet antenna to the connector on the top side of the Base Station.
- Connect the cable of the ISM antenna to the connector on the bottom side of the Base Station; mount the ISM antenna upright (instructions included in the bag with the antenna) with a clear line of sight to the Transmitters (max. 1,500m, version for Brazil/US max. 500m). Best performance is achieved when installing the ISM antenna for the Transmitters outside and without obstacles between them (like buildings, hills/mountains).

- Connect the Base Station with the power supply. The Base Station will automatically switch on. For information about alternative power supply (solar energy system or car battery) please check the User Manual.
- Check the LED lights after 20 seconds



If not: see the Troubleshooting section in User Manual.

For more information on the Base Station and how to operate the menus, please see the Base Station chapter in the User Manual.

Fix all cables properly once the installation is complete.

# Step by step installation guide

## - Preparing the field set up



### Installation Device

- Insert the batteries into the Installation Device. Remove the rubber cover, then remove the battery cover by shifting it in the direction of the arrow. Insert the batteries (pay attention to the polarity of the batteries), then insert the battery cover. Afterwards, put the rubber cover back on starting from the connector side.
- Select the menu language by using the up and down buttons (↓ and ↑). Confirm your selection by pressing the return button (↵).

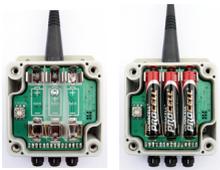
# Step by step installation guide

## - Preparing the field set up



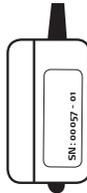
### Transmitter

- Insert the batteries into all Transmitters. Loosen the four screws on the top of the Transmitters and carefully open the covers. Insert the batteries as indicated and close the lids tightly with the screwdriver.



Please insert all three batteries in the right direction. If necessary, push battery contacts a little bit together.

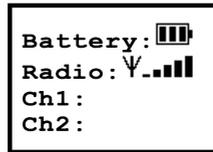
- Each Transmitter has a unique identification code that you can find on the label on the side. The code allows you to check that the Transmitter is activated and is sending data to the Base Station.



- Check the Transmitter status by connecting the Installation Device by using the Installation Cable to the "Ch3"-connector of the Transmitter.



- Installation Device shows Status screen:



- Check the battery status on the first line (  ). If there is no Status screen, please see section "Transmitter-Troubleshooting" in the User Manual.

- Once you have checked that all the Transmitters are working, the Installation Cable must be removed from the Installation Device.

For more information on the Base Station, Installation Device and Transmitters, please see the relevant chapters in the User Manual and the video tutorials available at [www.yara.com/water](http://www.yara.com/water).

**Now you are ready to do the installation in the field.**

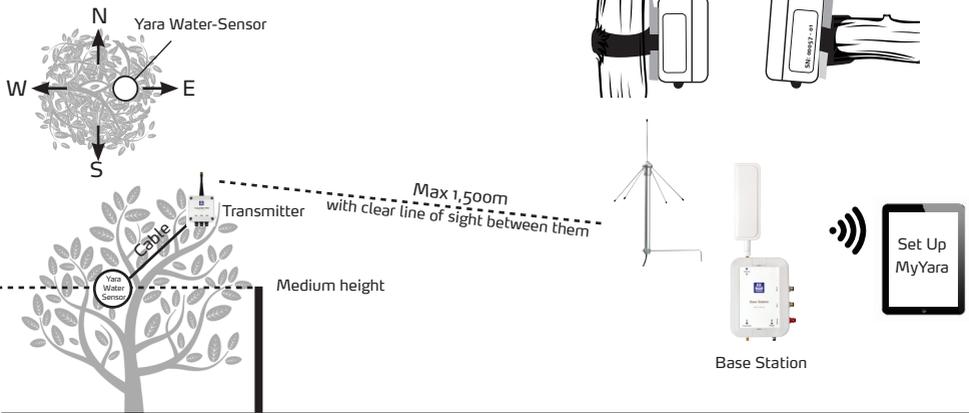
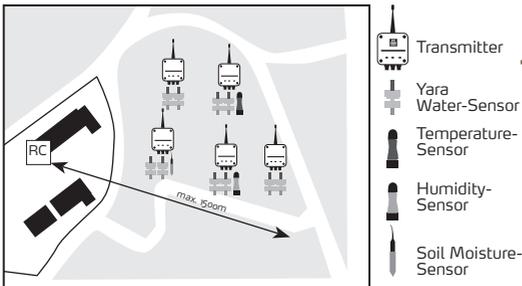
# Step by step installation guide

## - Installing Transmitters and Yara Water-Sensors in the field



Before you start please view the video tutorials available at [www.yara.com/water](http://www.yara.com/water)

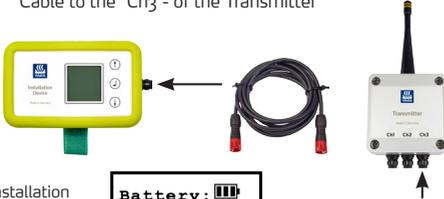
- Take the Transmitters, Yara Water-Sensors, microclimate sensors (Temperature-Sensor; Humidity-Sensor and Soil Moisture-Sensors) and the Installation Device including the Installation Cable and go to the plot which you want to monitor. Do not forget a spade and a ladder if needed.
- Choose 5 representative trees in your plot, scattered all over the plot.
- Keep in mind that the maximum distance to the Base Station is 1,500m (version for Brazil/US max. 500m) with clear view to the ISM-antenna that is connected to the Base Station.
- Yara Water-Sensors should be installed on the east side of the trees - and at medium height of the tree.
- Transmitters should be installed at the reach of the cable from the external part of the tree where the Yara Water-Sensors will be installed later on. You can plug any sensor into any Transmitter and any channel.
- Locate the Transmitter as high as possible in the tree with the antenna on the top to ensure the best connection to the Base Station.
  - Use a ladder where tree height does not allow safe installation.
  - Wires or poles used in trellis for the crops can also be used to hold Transmitters.



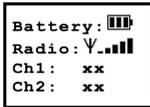
# Step by step installation guide

## - Installing Transmitters and Yara Water-Sensors in the field

- Check the radio connection to the Base Station by connecting the Installation Device with the Installation Cable to the "Ch3"- of the Transmitter



Installation Device shows status screen:



The connection quality is shown in bars. If there are less than three filled (e.g. ), try the following:

- remove leaves or other objects which are near the antenna
- check if the antenna is vertical
- select another position for the Transmitter (closer to the Base Station or above the plants)

The connection quality test can be repeated by pressing the down button. If problem persists, see section "Transmitter Troubleshooting"

- Install 2 Yara Water-Sensors on different leaves of the same tree, five trees in total. Put the Installation Device on your wrist by using the velcro strips.
- Select a healthy, not too young, fully developed leaf on the east side and at medium height of the tree.

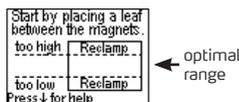


In perennial trees, it is important not to clamp on leaves older than two seasons as they may fall down during the present season. Leaves that are not fully developed may give incorrect values. Therefore, in deciduous species, leaves must be fully-grown before clamping the Yara Water-Sensors.

- Make sure you have clean and dry leaves to ensure full contact between the Yara Water-Sensor and the leaf.
- Start by connecting the Yara Water-Sensor to the Installation Device and separating both magnets of the Yara Water-Sensor.

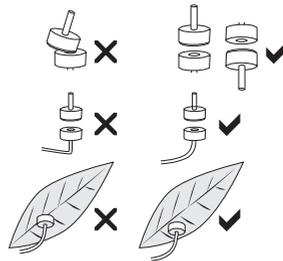


- After a few seconds, the Installation Device will show the following screen:



Before any attempt to clamp on a leaf it is recommended that you check magnetic pressure of the Yara Water-Sensor by bringing both magnets together. This will make you more aware of the magnetic force and help to avoid damages when clamping onto the leaf.

- Select a smooth leaf area without pronounced veins. Place the leaf between the two magnets of the Yara Water-Sensor and carefully bring the two magnets together. To avoid damaging the leaf keep the magnets parallel all the time.
- The pressure sensor part of the Yara Water-Sensor (blue part) can be placed on the adaxial (top) or abaxial (down) side of the leaf.

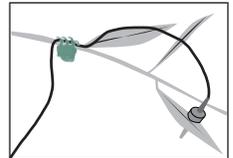


- The bar on the Installation device screen moves up when pressure is sensed by the Yara Water-Sensor (this can be tested by pressing with a thumb). If the bar is in the optimal range, the signal is evaluated, and after a short time the result is given:



- In case of several unsuccessful clamping attempts on the same leaf, you may try another leaf nearby.
- If a leaf is damaged during the clamping process, please change leaf.

- Fix the wire of the Yara Water-Sensor onto a branch nearby by using the clip (included). This is to prevent tension on the Yara Water-Sensor. This can be done after final clamping.



- Once a valid measurement is displayed, remove the connection to the Installation Device and insert the plug of the Yara Water-Sensor into the Transmitter. The channel is not relevant.



Repeat the above process for the second Yara Water-Sensor on this tree, check if other sensors need to be placed in the same tree (see next section) or move on to the next tree.

# Step by step installation guide

## - Installing the other sensors in the field

- Install the Temperature-Sensor, Humidity-Sensor and Soil Moisture-Sensor. If 2 sensors are installed per Transmitter, there is one channel available for an additional sensor. These are used for the Temperature-Sensor, Humidity-Sensor and Soil Moisture-Sensor.
- The Soil Moisture-Sensor is used for monitoring irrigation events. Shallow installation is recommended into one of the wetted bulbs (15-30 cm deep).
- Use a spade or similar tool to install the Soil Moisture-Sensor at the desired depth into a wetted area of one of the emitters at the selected tree.
  - In free, light soils with low compaction (like sandy soils) installation may be done by inserting the sensor directly down into the soil until desired distance is reached (shallow installation).
- Apply water directly on top of the place where the Soil Moisture-Sensor has been installed and wait until water moves down into the soil and reaches the device.
- Make sure that the sensor is in full contact with the soil. Successful installation can be checked by connection the Soil Moisture-Sensor to the Installation Device: If the soil the output should be above 0%.
- Once the Soil Moisture-Sensor is located in the right place, insert the plug into the free channel of the Transmitter at the selected tree.

For more information, please see the relevant chapter in the User Manual and the video tutorials available at [www.yara.com/water](http://www.yara.com/water).

## Checking the installation

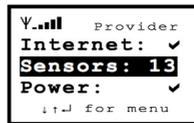
Once installation in the field is complete, all Transmitter signals must be received by the Base Station.

- Connect the Installation Device to the Base Station to check that all Transmitters are received. Use the Installation cable to connect the Installation Device to the service connector of the Base Station.

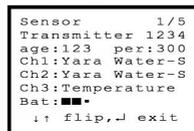


- The connected Installation Device shows you the Base Station Status screen with the number of all connected sensors. Check that all transmitters with sensors plugged in are received:

Activate the menu by pressing the return button (↵).



Go to the Sensor menu by pressing the return button again. Browse the Transmitters by using the up and down buttons (↓ and ↑).



**5 minutes after the field installation is finished, the identification codes of all five Transmitters should appear in the list.**

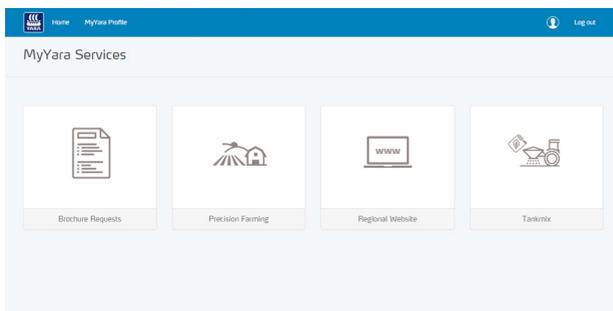
# Step by step installation guide

## - Connection to MyYara

Create your account and your farm, and define the installation you made in the field.

**1. Start creating your user account by logging in to MyYara using your web browser navigation panel: [www.myyara.com](http://www.myyara.com)**

- a. Click on "Register" and fill in all required information.
- b. After filling all the information you will receive an activation email. In the email, you will be prompted to click on a link. This link will activate your account and take you back to MyYara.
- c. Log into MyYara again using your credentials – the username and password as defined by you.
- d. After the login you should see the following landing page\* (\*the services that are available can vary depending on your personal settings):



- e. Before you can receive water recommendations and review the water status of your crop, you need to register the devices in your MyYara account, and give your farm details (see following steps).

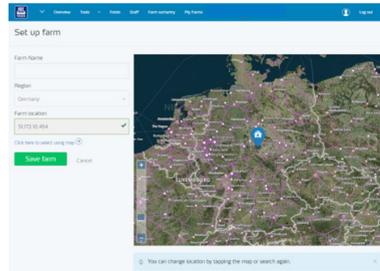
# Step by step installation guide

## - Connection to MyYara

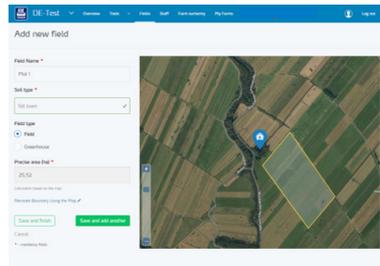
### 2. Create your Farm and Field

a. Click on "Precision Farming":

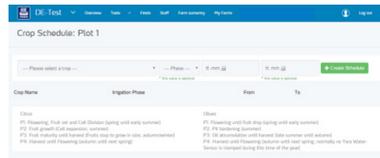
b. Follow the steps to create a new farm. Fill in all required entry fields. To mark your farm location on the map, press on "Click here to select using map" and place the blue dot on the position of your farm. Click on "Save farm" to finish the process.



c. Click on "Add a field" and fill in all required entry fields. The area and boundaries of the field can be selected by using the map. Click on "Recreate Boundary Using the Map" and then mark your field/irrigation plot where the Yara Water-Sensors are installed. Single click the left mouse button in the first corner of your field to start defining the area of the field. Continue marking each corner / angle with a single click of the left mouse button. Finish the marking of the area with a double-click (the area with a yellow boundary should appear on the map). Click on "Save and add another" to continue creating fields or "Save and finish" to finish the process.



d. On the "Fields" page, select "Crop Schedule". Fill in all required entry fields and confirm by pressing "+ Create Schedule".



# Step by step installation guide

## - Connection to MyYara

### 3. Describe the installation you have made in the field

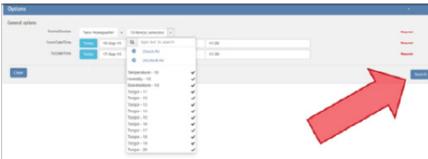
a. Go to "Tools / Water Solution".

b. **Assign devices** using the link on the "Water Status" page or by going to "Menu / Farm Management / Devices". Insert the Barcode delivered with your Yara Water Solution Set. Confirm by pressing "Apply code".

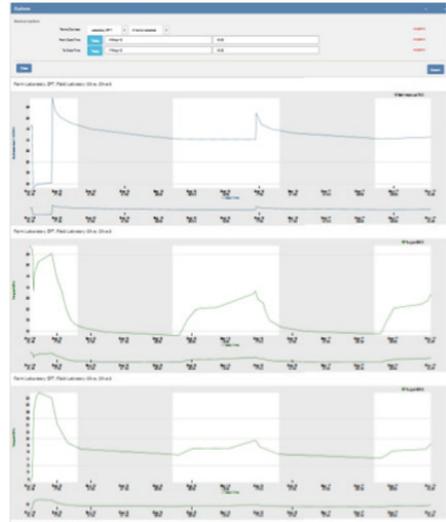
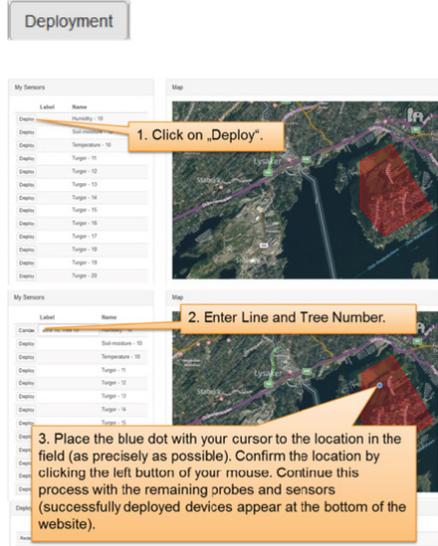
c. The next step is to **deploy** the Yara Water-Sensors and the microclimate sensors to the field where you made the installation. Use the installation scheme notes you took during installation.

Click on "Menu / Farm Management / Deployment" in order to deploy the Yara Water-Sensors and microclimate sensors. For detailed description on how to do it, see the graphic on the side. Please do not forget to enter the Line Number and Tree Number of the respective Yara Water-Sensor or microclimate sensor!

d. In the next step you can check if you receive all the data from the field. On the left-hand side menu go to "Menu/Graphs". From the drop down menu choose the devices you have installed and click on "Search". Your Yara Water-Sensor and sensor readings should appear.



e. After 24 h you will see the water status of your crop; see next chapter.



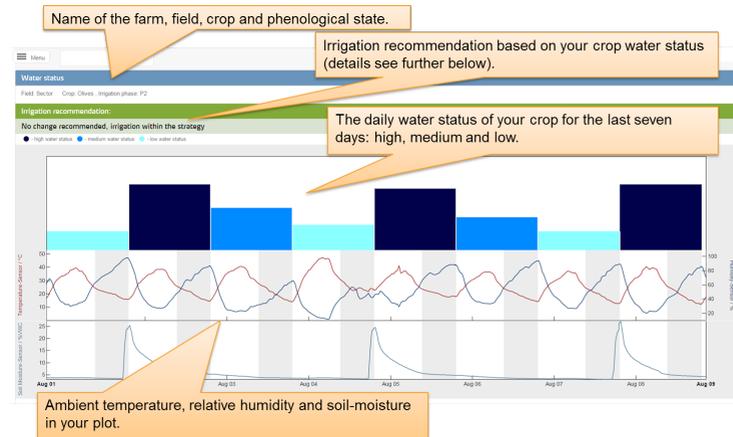
# Step by step installation guide

- How to manage your irrigation by using the MyYara account

## 1. Log into MyYara

2. Go to **WaterSolution.MyYara** by clicking on "Precision Farming/Menu/Tools/Water Solution".

3. **The irrigation recommendation and water status of your crop will be displayed** (if not click on "water status" on the left-hand side menu). Everything you will need for the daily management of your irrigation will be shown to you at this page:



## 4. Irrigation recommendation

A detailed description of how to use the irrigation recommendation is given in the User Manual. This recommendation is based on a predefined irrigation protocol developed by Yara and it is specific for the crop during the selected phenological stage. To get a valid recommendation your farm data must include the crop name and in which phenological stage it is at any given moment.

The system processes the individual Yara Water-Sensor values and other environmental data and assigns a daily classification of the plot water status. The water status classification leads to an irrigation recommendation. The main target is to optimize irrigation avoiding both over-irrigation and uncontrolled drought stress.



**Please Note:**

Whilst every care is taken to ensure that the results from the Yara Water-Sensor technology are as accurate as possible, it is important to note that the analyses and the recommendations relate to the trees measured by the Yara Water-Sensor, and are representative for those trees only. No warranty is given by Yara that results from analyses from certain trees relate to any other part of a field or growing area. It is important to ensure that trees chosen for analysis are representative of the area requiring analysis. Because of this and the multitude of different production systems, on various soils and under countless climatic conditions, Yara disclaims all warranties, express or implied, as to the accuracy of the information gathered by the tool and takes no liability for management decisions based on this information. When using the Yara Water Solution the user accepts that he will take full responsibility for all management decisions.

If you have any questions, please do not hesitate to contact us.

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