# Potato: ECOMETHOD

## Aim of the trial

Evaluation of the NTF and NPF (Total / Partial foliar nutrition) methods on potatoes.

## General information

Conditions of the trial:

| | | | |
|---|---|---|---|
| Trial location: | Belgium – Henegouwen | Variety: | Fontane |
| Soil type: | Loam | Previous crop: | Wheat |
| Planting date: | 07/05/2020 | Plant density: | 40 x 75 cm |
| In cooperation with: | Carah | | |

Material and methods:
Full randomized trial with microplots; 4 replicates. Each elementary plot was 3 m wide and 5.6 m long (4 rows of 15 plants, 16.8 $m^2$). At the end of the growing season, a sample of 10 plants was taken in each of the microplots for analysis of the yield, dry matter content and quality of the potatoes.

## Treatments

4 modalities. The fertilization in the control was calculated based on a soil analysis to cover the need for an expected yield of 50 t/ha. No phosphorus is given because there is more than enough present in the soil.
On 19-08-2019, cattle manure was spread over the entire field at 30 t/ha.

**Soil fertilization**:

| | **Nitrogen** (units N as liquid nitrogen 39%) – 29/04/20 | **Potassium** (units $K_2O$ as KCl60) – 06/04/20 |
|---|---|---|
| Control | 80 U | 60 U |
| Modality 1 (NPF) | 60 U | 60 U |
| Modality 2 (NPF) | 60 U | 60 U |
| Modality 3 (NTF) | 0 U | 0 U |

**Foliar nutrition:**

Modality 1 – foliar applications

| **10-15 cm height** | **20 cm height** | **30 cm height** | **30-40 cm height** | **End of vegetative cycle** |
|---|---|---|---|---|
| 10/06/20 | 17/06/20 | 26/06/20 | 06/07/20 | 13/07/20 |
| Fructol NF 1.5 kg/ha<br>Hyberol 1 L/ha | Fructol NF 2 kg/ha<br>Hyberol 1 L/ha<br>Kappa M 4 kg/ha | Fructol NF 2 kg/ha<br>Hyberol 1 L/ha<br>Kappa M 4 kg/ha | Kappa M 4 kg/ha | Kappa M 4 kg/ha |

Modality 2 – foliar applications

| **20 cm height** | **30 cm height** | **30-40 cm height** | **End of vegetative cycle** | |
|---|---|---|---|---|
| 17/06/20 | 30/06/20 | 13/07/20 | 28/07/20 | 12/08/20 |
| Fructol NF 1 kg/ha<br>Hyberol 1 L/ha<br>Kappa M 4 kg/ha | Fructol NF 1 kg/ha<br>Hyberol 1 L/ha<br>Kappa M 4 kg/ha | Kappa M 4 kg/ha | Kappa M 4 kg/ha | Kappa M 4 kg/ha |

Modality 3 – foliar applications

| **2-4 leaves along with post-emergence herbicide application** | **Pre – start of flowering** | **Beginning of tuber formation** | **Tubers of 2 cm** | **1 month before harvest** |
|---|---|---|---|---|
| 27/05/20 | 23/06/20 | 07/07/20 | 22/07/20 | 05/08/20 |
| Fructol NF 1.5 kg/ha<br>Chelal Zn 1.5 L/ha | Fructol NF 1.5 kg/ha<br>Kappa V 2 kg/ha<br>Chelal B 1 L/ha | Fructol NF 1.5 kg/ha<br>Kappa V 4 kg/ha<br>Chelal B 1.5 L/ha | Fructol NF 1.5 kg/ha<br>Kappa V 4 kg/ha | Fructol NF 1 kg/ha<br>Kappa V 3 kg/ha<br>Kappa G 3 kg/ha |

## Results

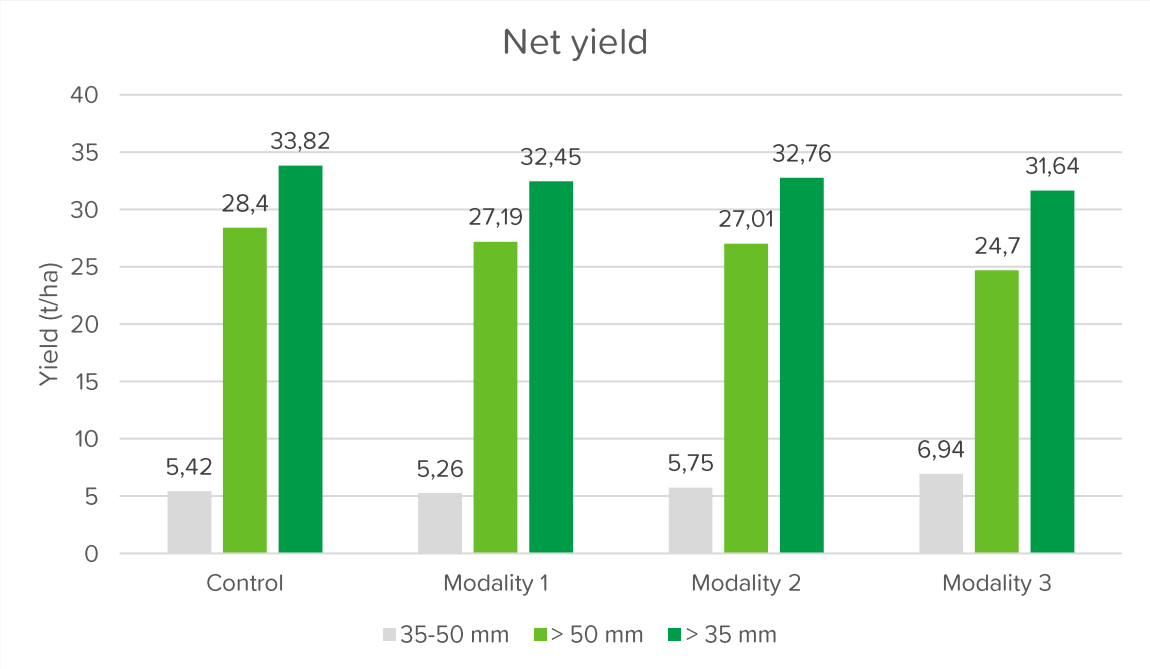
The end of July up to the end of August was marked by a pronounced drought, which even continued into September. Nevertheless, the rare rains fell at the right times in the season, which allowed good development of the tubers. Given the rapid progress through the phenological stages, senescence set in fairly quickly in the plots, partly due to the periods of heat.

**Yield:**

Net amount of tubers:

| | 35-50 mm | > 50 mm | > 35 mm |
|---|---|---|---|
| **Control** | 27.00 | 58.75 a | 85.75 |
| **Modality 1** | 27.75 | 54.50 ab | 82.25 |
| **Modality 2** | 29.00 | 54.25 ab | 83.25 |
| **Modality 3** | 36.25 | 52.00 b | 88.25 |

Net yield:




⇨ In terms of net yields, there is no significant difference between the different calibre classes.

**Tuber quality:**

| | Control | Modality 1 | Modality 2 | Modality 3 |
|---|---|---|---|---|
| **Underwater weight (g/5000g)*** | 427 | 408 | 424 | 424 |
| **Total tare = green, cracked, misshapen tubers (%)*** | 0.00 | 0.68 | 0.54 | 2.20 |
| **Floating potatoes (%)*** | 0.00 | 0.00 | 0.54 | 0.60 |
| **Brown discoloration index*** | 2.00 | 2.00 | 2.00 | 2.00 |

* No significant difference has been demonstrated.

- ⇨ The underwater weights are correct for this variety (according to industrial technical quality requirements).
- ⇨ The brown discoloration indices after baking (3 minutes in oil at 180°C) are excellent according to the VAVI index scale.

## Calculation of the carbon footprint of Ecomethod

| Quantity $CO_2$ eq. ECOMETHOD Modality 1 | Quantity $CO_2$ eq. ECOMETHOD Modality 2 | Quantity $CO_2$ eq. ECOMETHOD Modality 3 | Quantity $CO_2$ eq. TRADITIONAL FERTILIZATION (Control) |
|---|---|---|---|
| 423.74 kg/ha | 424.86 kg/ha | 62.70 kg/ha | 452.86 kg/ha |

| | | |
|---|---|---|
| ~~$CO_2$~~ | Modality 1: 29.12<br>Modality 2: 28.07<br>Modality 3: 390.16 | The reduction of $CO_2$ eq. expressed in kg/ha |
| ~~%$CO_2$~~ | Modality 1: 6.43%<br>Modality 2: 6.20%<br>Modality 3: 86.16% | The saving percentage of $CO_2$ eq. |