BMS MICRO-NUTRIENTS
CHELATED MICRO-NUTRIENTS & FOLIAR FERTILIZERS

Italy

Hazelnuts: ECOMETHOD in young orchard

Aim of the trial

This report shows the results of 3 years of trials (2018-2020) in which only foliar fertilizers (NTF) were applied to a young hazelnut orchard.

General information

Conditions of the trial:

Trial location:	Italy – Toscana	Plant density:	555 trees/ha, 4.5 m x 4 m
Age of the trees:	Second leaf in 2018	Variety:	Tonda di Giffoni
Soil type:	Clayey loam, slightly alkaline - neutral, OM = 0.7 – 1.68%: (average – low)		
In cooperation with:	Università degli Studi della Tuscia		

Treatments

2 modalities (fields of 1 ha):

⇨ T0: Control (only soil fertilization)

	Year	Product	Quantity	Date
1	2018	Urea (N - 46)	100 kg/ha	End of March
2	2019	15-9-15	100 kg/ha	End of March
3	2020	15-9-15	100 kg/ha	End of March

⇨ T1: BMS MN applications (without soil fertilization, identical program for the 3 years). Volume of water: 400 L/ha

	Product	Quantity	Date
1	Kappa M	5 kg/ha	Medio May
2	Fructol NF	2.5 kg/ha	Early June
3	Fructol NF	2.5 kg/ha	Early July
4	Fructol NF	3 kg/ha	Early August

Results

For each modality, 12 plants (two replicates of 6) were selected for the measurements. Leaf measurements were performed on the first two mature leaves for all plants of the different modalities.

Leaf surface (cm^2, average values of 20 leaves per plant)

	2018		2019		2020		Mean of 3 years
	25/06	30/07	20/06	27/07	24/06	28/07	
Control	69.33	62.99	86.31	77.11	64.74	57.28	69.63
BMS MN	82.41	66.84	86.01	83.31	62.28	67.31	74.69

⇨ The leaf surface showed no significant differences between the foliar fertilization and traditional fertilization.

Chlorophyll (Chl), flavonols (Flav), anthocyanins (Anth) and NBI index (nitrogen balance index) measured with the DUALEX PLUS device – mean values of 3 years

	Modality	Chl	Flav	Anth	NBI
June	**Control**	33.40 ± 4.44	1.96 ± 0.28	0.05 ± 0.03	17.51 ± 3.41
	BMS MN	35.48 ± 3.14	2.12 ± 0.20	0.04 ± 0.02	16.84 ± 1.91
July	**Control**	37.08 ± 4.12	2.12 ± 0.19	0.06 ± 0.02	17.65 ± 2.45
	BMS MN	39.60 ± 5.70	2.14 ± 0.25	0.05 ± 0.03	18.68 ± 2.89
Mean	**Control**	35.24 ± 4.64	2.04 ± 0.25 B	0.05 ± 0.03	17.58 ± 2.95
	BMS MN	37.54 ± 5.70	2.13 ± 0.23 A	0.05 ± 0.02	17.76 ± 2.60

⇨ Significantly higher flavonol content in the BMS MN thesis ($p < 0.05$).

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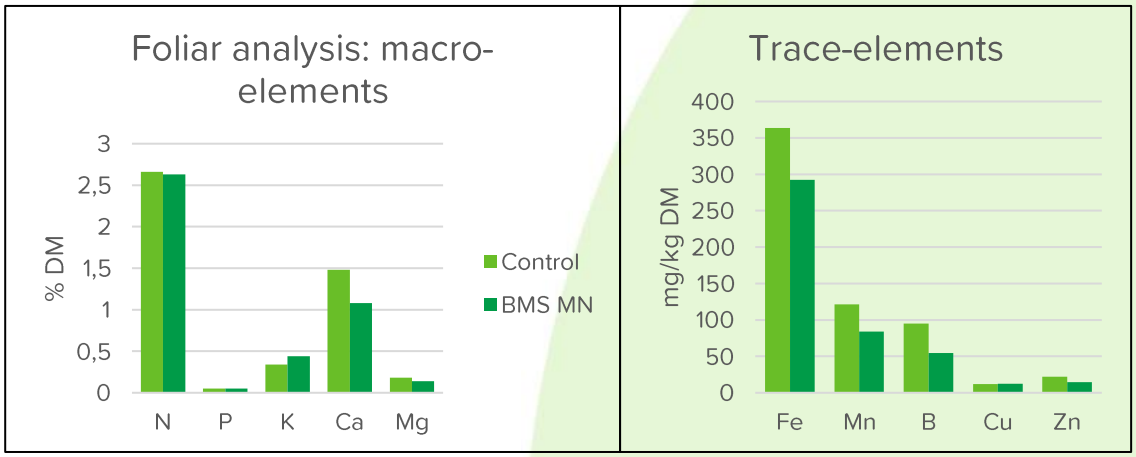
Trial reference: 2018-058
2019-096
2020-009

Foliar analysis (mean of 3 years and of the 2 sampling moments: June and July)



⇨ No significant differences in macro and trace elements.

Yield and diameter of the trunk – data from 2020

Modality	Mean number of fruit clusters with nuts/plant	Mean number of hazelnuts/plant	AST - calculation of the diameter of the trunk at 20 cm height (cm^2)
Control	0	0	10.30
BMS MN	2	3.75	10.76

⇨ The plants of the BMS MN modality showed a greater production of hazelnuts, indicating earlier production of the trees.

Calculation of the carbon footprint of Ecomethod

Calculation for 1 ha and for the 3 years of the trial.

Quantity CO_2 eq. ECOMETHOD	Quantity CO_2 eq. TRADITIONAL FERTILIZATION (Control)
95.4 kg/ha	422.6 kg/ha

~~CO_2~~	327.2	The reduction of CO_2 eq. expressed in kg/ha
~~%CO_2~~	77.4%	The saving percentage of CO_2 eq.