

## Article

# Optimizing Sustainability in Malting Barley: A practical Approach to Nitrogen Management for Enhanced Environmental, Agronomic, and Economic benefits

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**Table S1.** Chemical and physical soil properties at the beginning of the experiments in Livadia and Larissa (2021).

Soil Properties	Livadia		Larissa	
	0-20cm	20-40cm	0-20cm	20-40cm
Sand, %	77.5	75.1	28.56	28.6
Silt, %	6.1	8.3	33.44	33.4
Clay, %	16.4	16.6	38.00	38.0
pH	8.4	8.4	7.5	7.5
Organic matter, %	1.8	1.4	1.10	1.10
EC <sub>1:1</sub> , $\mu\text{S cm}^{-1}$	100	140	672.50	362.5
P (Olsen), mg kg <sup>-1</sup>	23	16	37.50	35.5
Exchangeable K, mg kg <sup>-1</sup>	110	71	160	160

**Table S2.** Field plot operations throughout the malt barley growing season in Livadia and Larissa.

Farm Operation	Fuel Consumption (L ha <sup>-1</sup> )	Comments
<b>Livadia</b>		
Tillage		
Moldboard plough	42.0	
Chisel plough	12.0	
Cultivator	10.0	
Sowing+fertilisation	11.1	
Fertilisation (topdressing)	1.7	
Herbicide+fungicide spraying	2.0	Tank-mix 2 herbicides (Axial 60EC: a.i. pinoxaden, rate 0.8 kg ha <sup>-1</sup> ; Mustang 306SE: a.i. 2,4D + florasulam, rate 0.8 kg ha <sup>-1</sup> ) and 1 fungicide (Zakeo extra SC: a.i. azoxystrobin + cyproconazole, rate 1.0 kg ha <sup>-1</sup> )
Harvest	25.0	
Straw baling	10.0	
<b>Total consumption</b>	<b>119.8</b>	
<b>Larissa</b>		
Tillage		
Disc harrow	20.0	
Tooth harrow	20.0	
Sowing+fertilisation	6.3	
Fertilisation (topdressing)	1.7	
Herbicide spraying	2.0	Tank-mix 2 herbicides (Axial 60EC: a.i. pinoxaden, rate 0.7 kg ha <sup>-1</sup> ; Colorado SE: a.i. 2,4D + florasulam, rate 0.8 kg ha <sup>-1</sup> )
Harvest	25.0	

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Straw baling	10.0
<i>Total consumption</i>	<b>85.0</b>

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