

Organic vegetable crop production needs careful interpretation of nitrogen recommendations

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Introduction

In conventional vegetable crop production nitrogen (N) advice systems based on N measurements during the growing season are more and more used or even obliged by legislation. We wanted to test whether these advice systems are also convenient for organic vegetable crop production.

Trial and field conditions

Sandy loam

6-year organic crop rotation

2011: grass-clover

23rd of May 2012: grass-clover mowed and mechanically destroyed

13th of June 2012: manure or compost applied

26th of June 2012: leek (Antiope) planted

19th of Sept 2012: commercial organic fertilizer applied based on KNS advice

22nd of Nov 2012: harvest



Treatments

Table 1: (Total (N_{tot}) and effective (N_{eff}) N supply for the different fertilization treatmentst

Fertilization	Advice KNS		N supply		Total N supply	
	kg N ha ⁻¹	kg N ha ⁻¹	kg N ha ⁻¹	kg Ntot ha ⁻¹	kg Neff ha ⁻¹	
	25 ton ha ⁻¹	114	19/sep			
1		0	-	153	53	
2	Manure	114	KNS	253	148	
3			KNS-organic	203	98	
4		0	-	280	28	
5	Compost	132	KNS	380	118	
6			KNS-organic	330	73	

Results

Table 2: Yield, crop quality and N residue in leek (Anova, Duncan)

Fertilization	Yield		Crop quality		N residue	
	kg ha ⁻¹		21-nov		0-90 cm	
					22-nov	
Effect of base fertilization						
Manure	28993	a	7,12	a	71,7	
Compost	26890	b	6,08	b	66,1	
Effect of fertilization during growth						
0	27045	b	6,69		44,48	c
KNS	28267	a	6,62		91,19	a
KNS-organic	28513	a	6,50		71,02	b
pfe	<0.01**		<0.01**		0,47	
pgr	<0.05*		0,75		<0.01**	
pfe*gr	0,80		0,43		0,99	

A control plot (in 4 replications) without any fertilization realized a yield of 27359 kg ha⁻¹

Conclusion

KNS advice is not always reliable in organic crop production.

Adapted (lower) N advice can assure a similar yield level and a lower N residue.

Advice should be based on soil N measurements and a good knowledge of the crop rotation and the actual field and crop conditions.

Grass-clover has an underestimated fertilizing value