

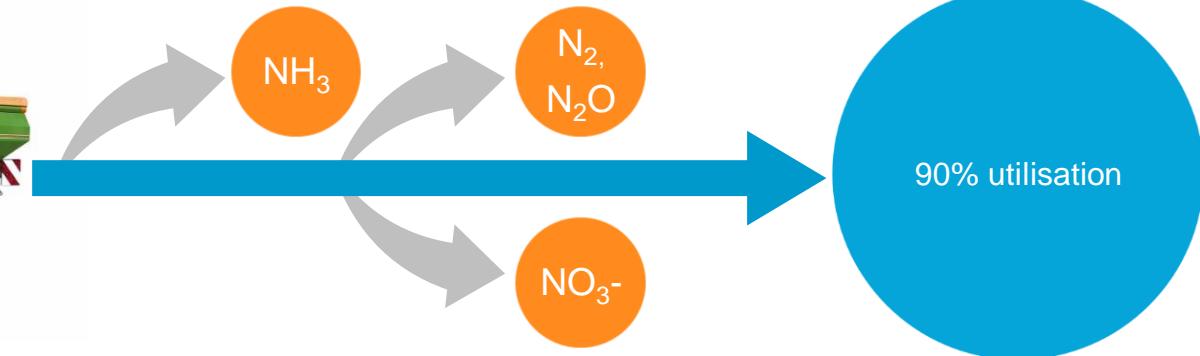


PIADIN®

The liquid manure refiner

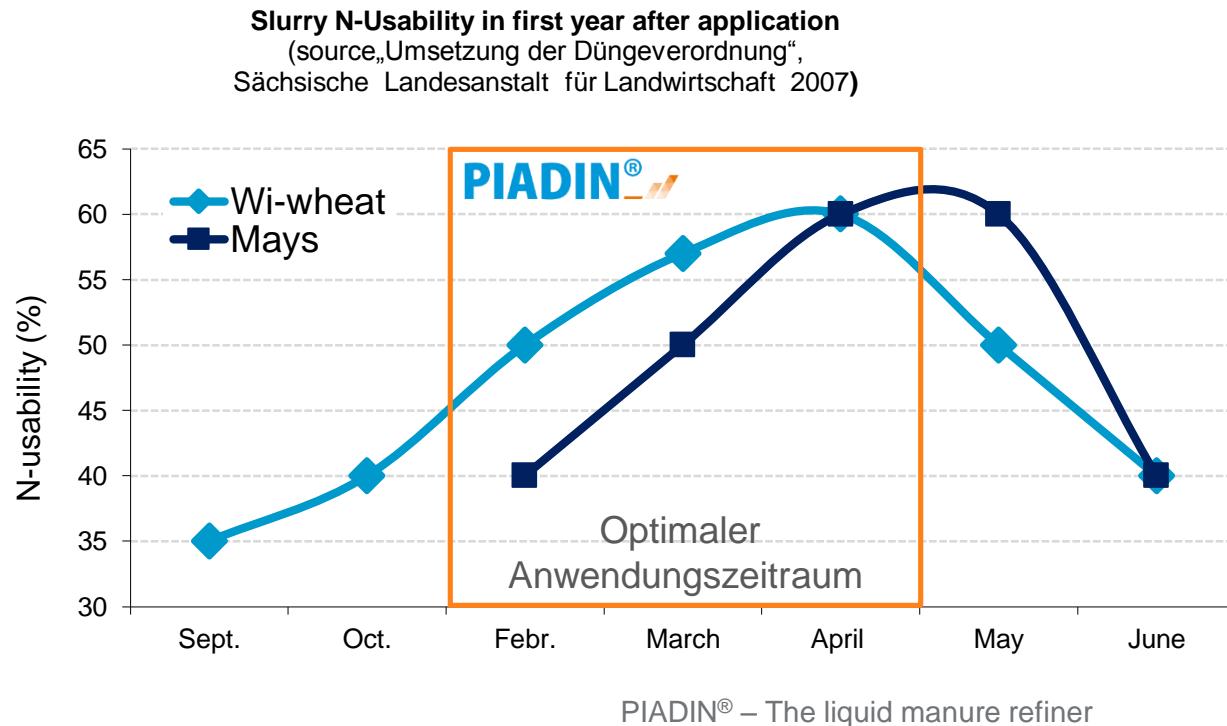
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Long-term utilization by plants



Verändert nach: Ebertseder und Gutser 2002

N-efficacy of manure and fermentation substrate





Adjusting the nitrogen fertilization to a realistic yield

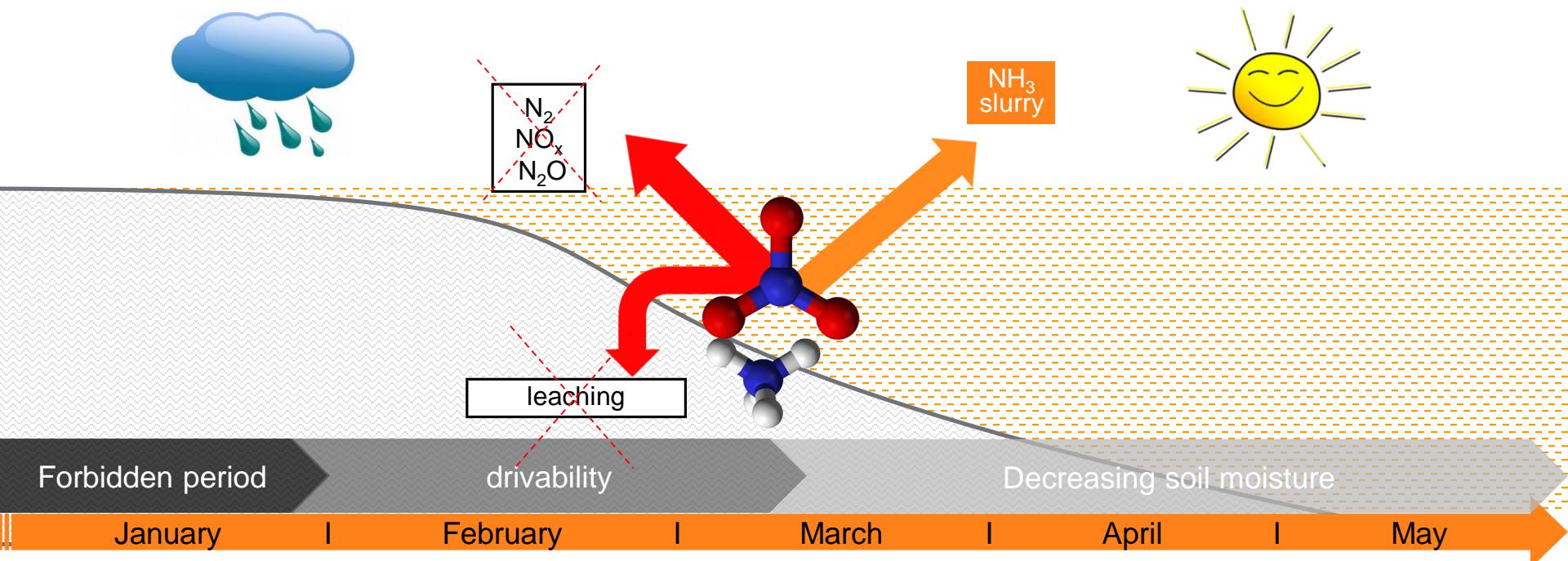
- Fertilization planning - specific to every field
- Fertilization “in the mouth of the plant”
- Ammonia nutrition
- Use of N-sensor and Precision-Farming

Optimized manure management

- Analyse manure on it's nutrients
- If possible, fertilize early - low temperature, often cloud cover and relatively high probability of precipitation
- Use of nitrification inhibitors - PIADIN®
- Mineral complementary fertilization

Bild: Kotte

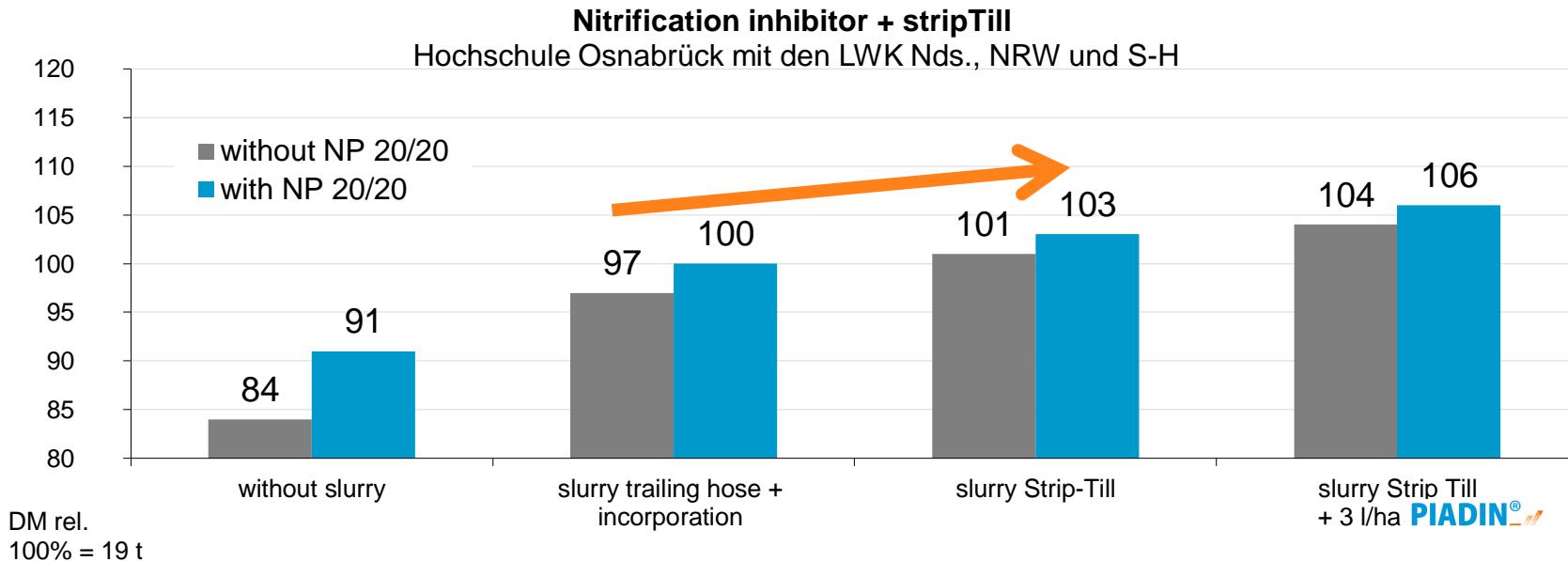
Influences on manure fertilization in cereals



StripTillage in Maize

- Best possibility to reduce ammonia emissions
- High level of acceptance among the population because it does not smell
- No problems with respect to incorporation within 4 hours
- Improved N and P efficiency erosion control
- Ammonium nutrition





Nitrification inhibitor (NI) – reduced N₂O losses



Digestate +/- nitrification inhibitor

treatment	N ₂ O-emissions	Standard-deviation	Reduced N ₂ O losses with nitrification inhibitor
	kg N/ha		
digestate in slit	0,90	0,25	
digestate in slit + NI	0,22	0,06	75 %

PIADIN® in the stabilised fertilisation system for winter wheat

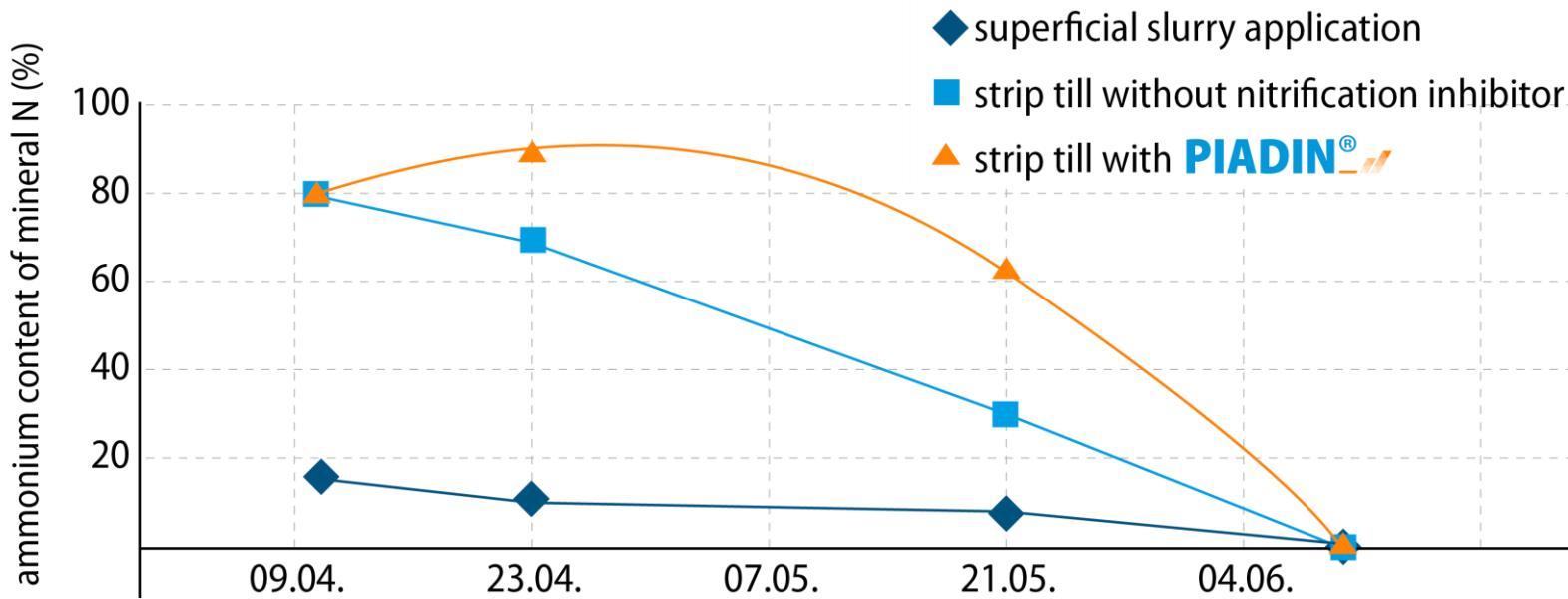
Liquid manure + PIAMON® 33-S

101.60 dt/ha

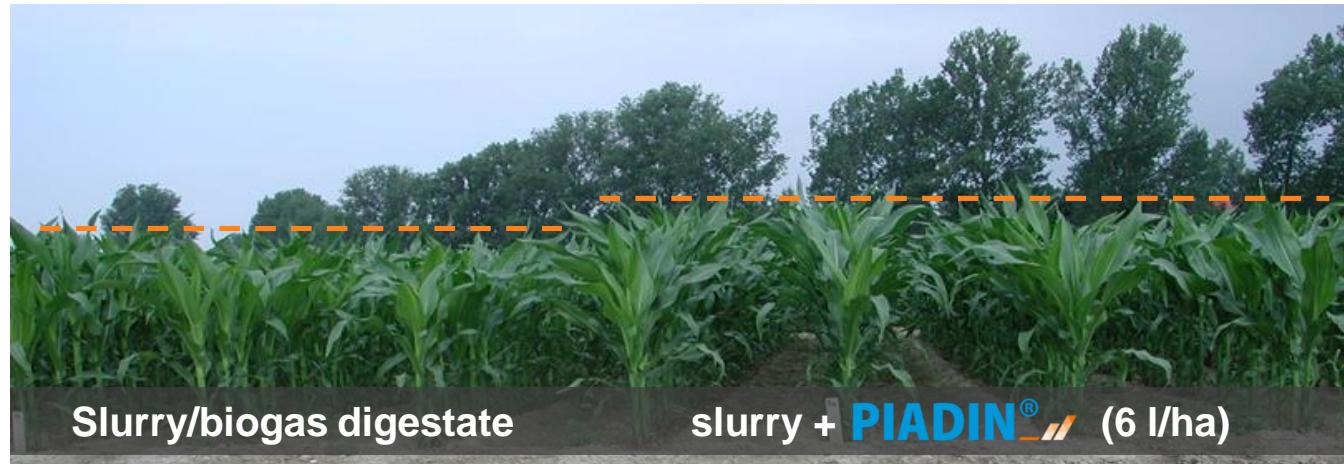
Liquid manure + PIADIN® (5 to 6 l/ha) + PIAMON® 33-S

104.65 dt/l

Test results LAF Cunnersdorf 2012 to 2016; n = 14; liquid manure or digestate fertilisation +/- PIADIN®; 40m³/l or 90 to 140 kg N/ha; mineral additional fertilisation; with PIAMON® 33-S or cereals-power® 60 to 120 kg N/ha total average N-quantity 210 kg N/ha



Source Schliephake 2015



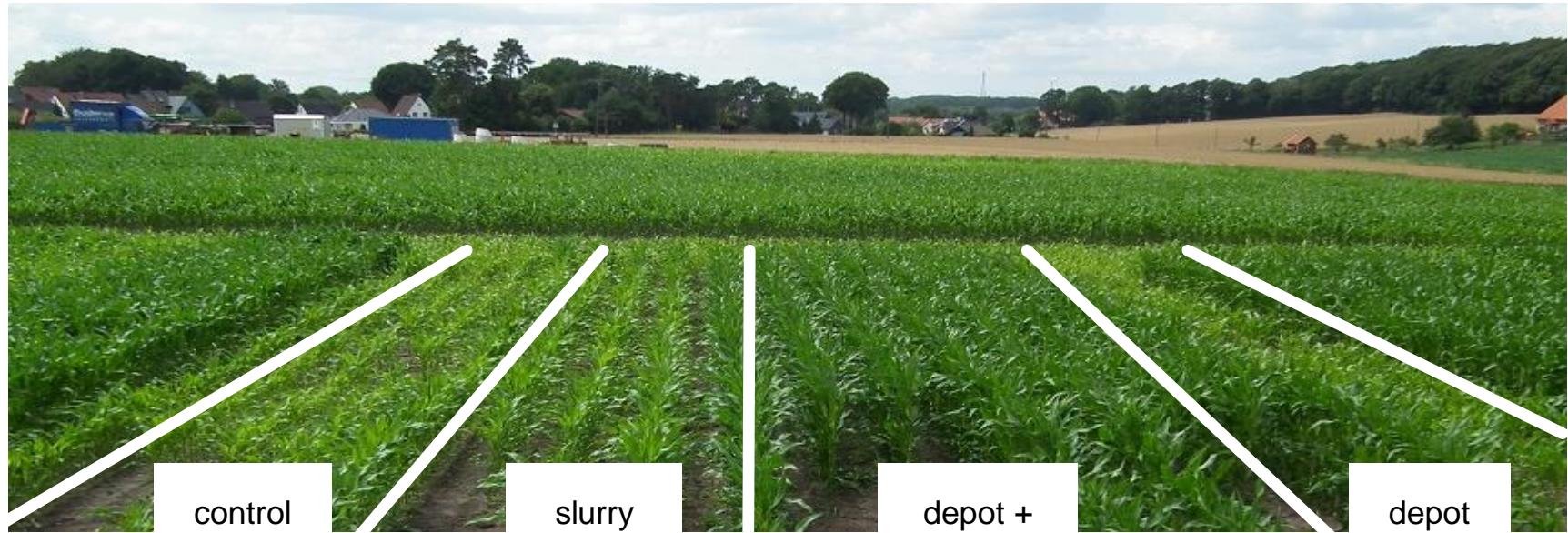
yield (corn):

slurry	8,83 t/ha	9,76 t/ha
Biogas digestate	9,40 t/ha	10,00 t/ha

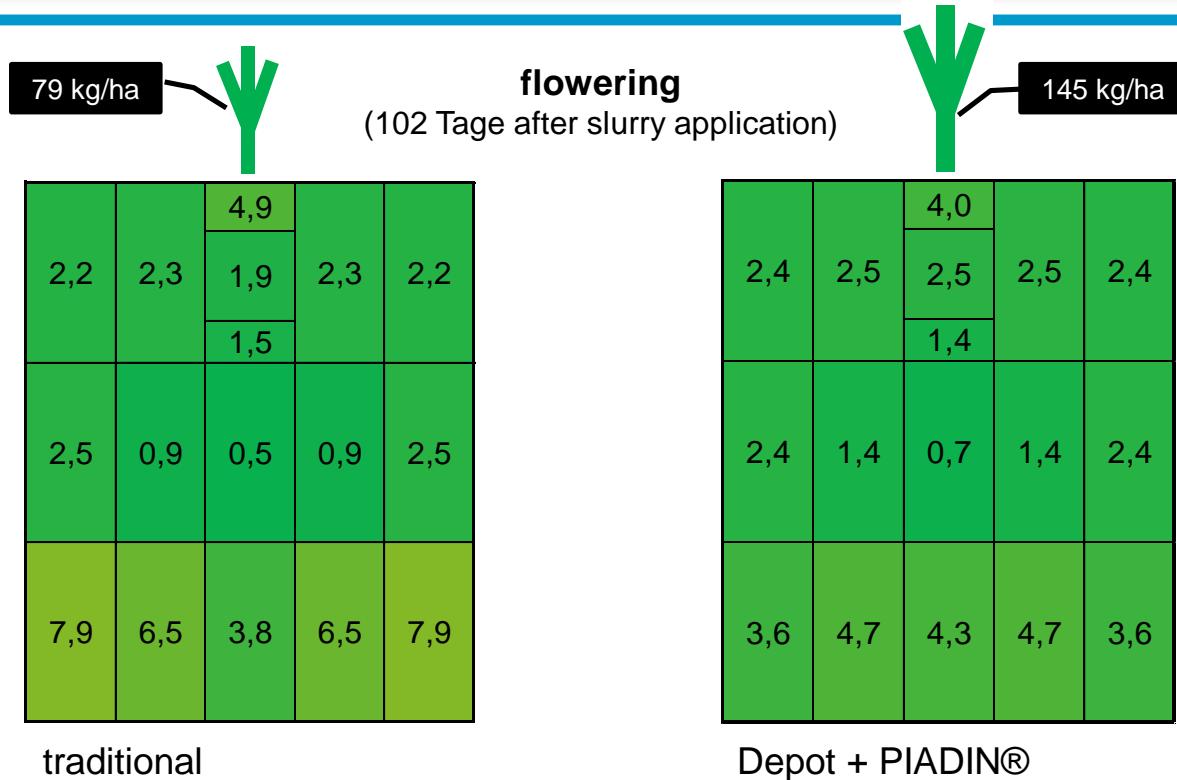
fertilisation: 19.03.2009, 160 kg N/ha ($\text{NH}_4\text{-N}$), Mays sowing 22.04.2009

PIADIN® application on field

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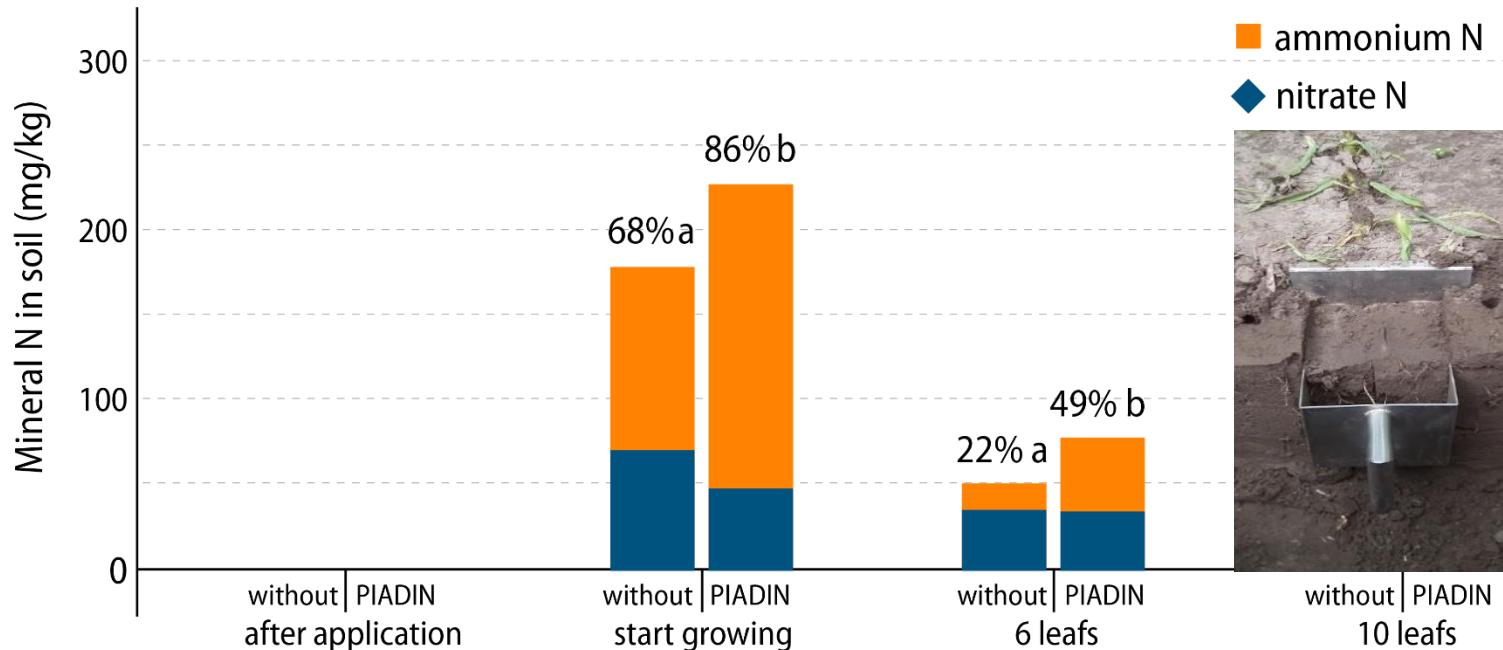


02.07.2014

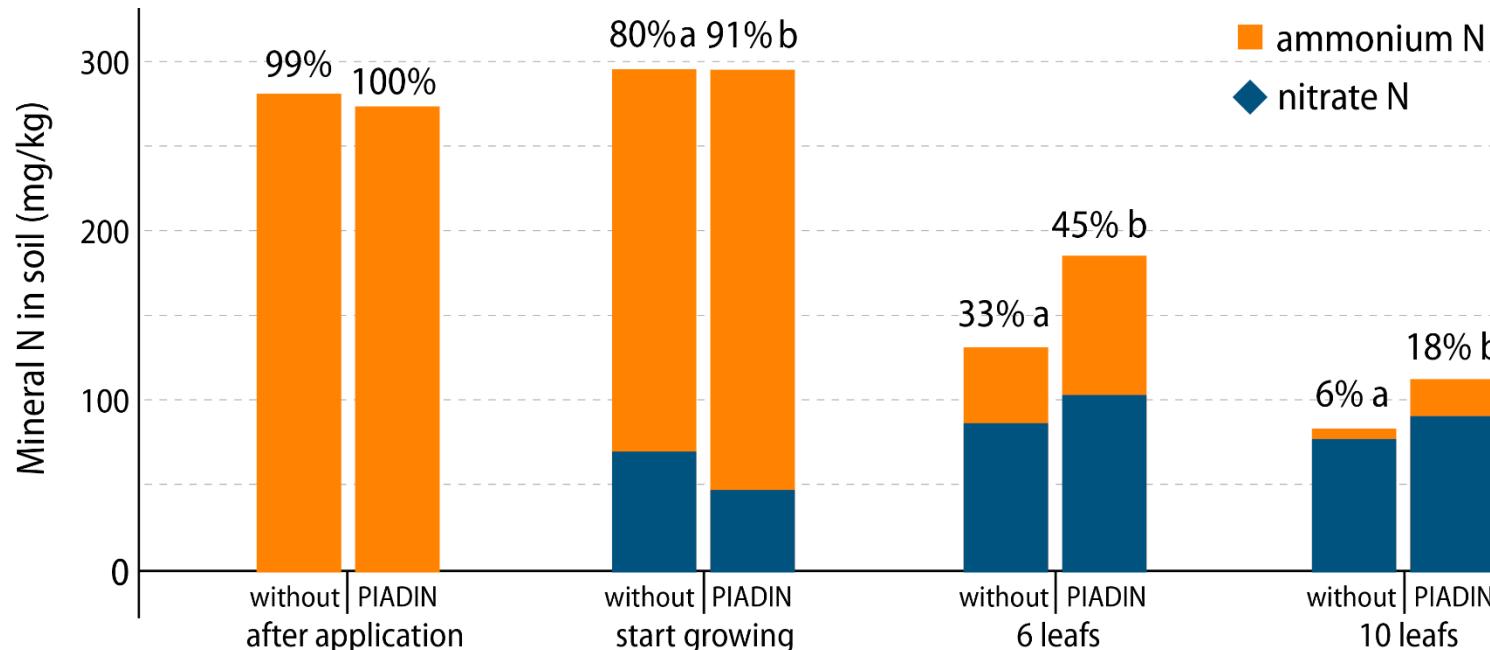


NH₄-N-stabilisation 2014

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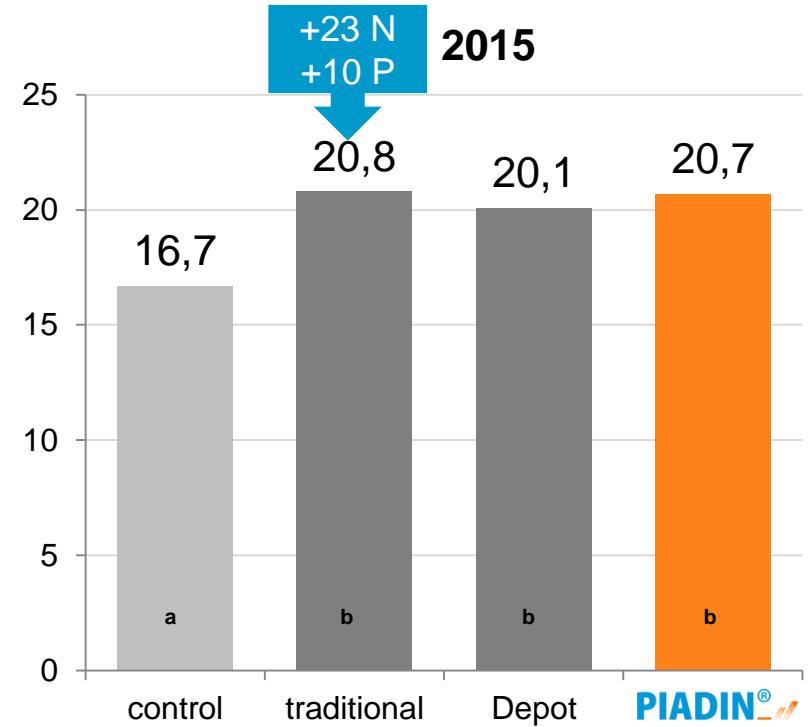
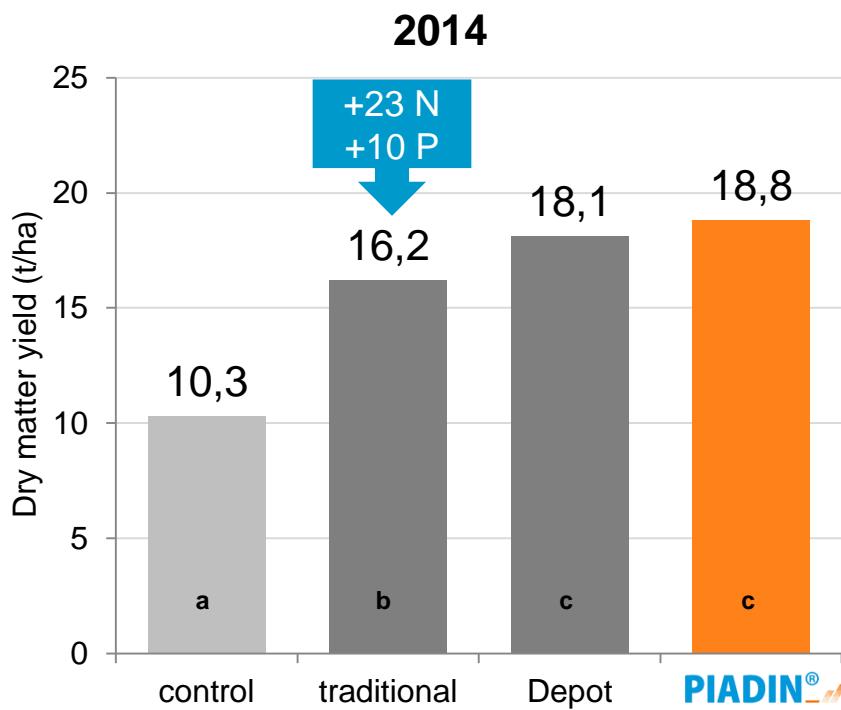


NH₄-N-stabilisation 2015



LSD; $\alpha = 5\%$; ANOVA

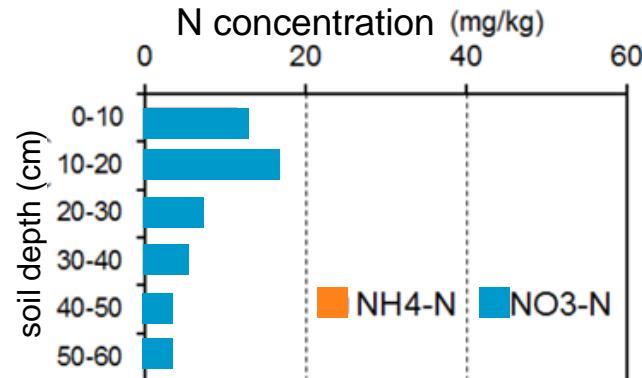
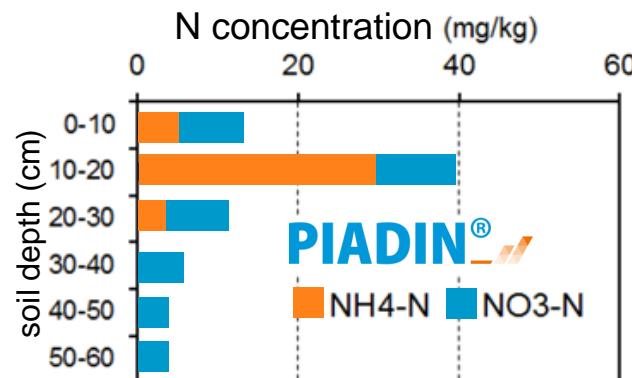
Dry matter yield



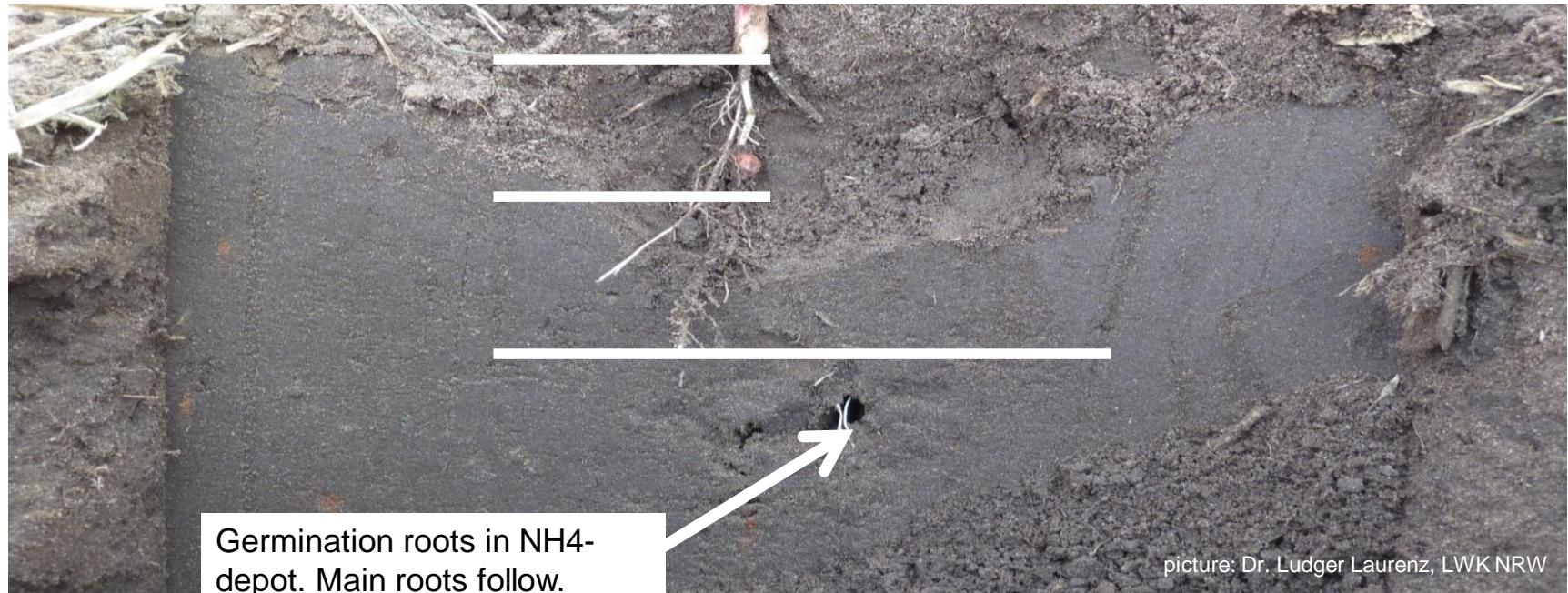
LSD; $\alpha = 5\%$; ANOVA

StripTill with digestate + **PIADIN®** (loamy sand, Kamenz 2013)

- StripTill on 15.05.2013
- 30 m³/ha digestate (63 kg/ha N, containing 36 kg/ha NH₄-N)
- Soil sampling on 10.03.2013, 26 days after application
- 130 mm rainfall 28.05 – 03.06.2013



Injection depth



Injection depth



Bild: Dr. Ludger Laurenz, LWK NRW

Root growth by ammonia nutrition



Ammonium nutrition



Results PIADIN® + StripTill

skw.
PIESTERITZ

Modified by LWK NRW, Dr. Laurenz, Coesfeld



Without PIADIN®

30 m³/ha pig slurry applied with trailing hose
+ incorporation in 15 cm. Addition of mineral
fertilizers (20 kg/ha N, 10 kg/ha P₂O₅)

With 3 l/ha PIADIN®

30 m³/ha pig slurry injected
in 12 cm. 3 l/ha PIADIN® were
added to the slurry.

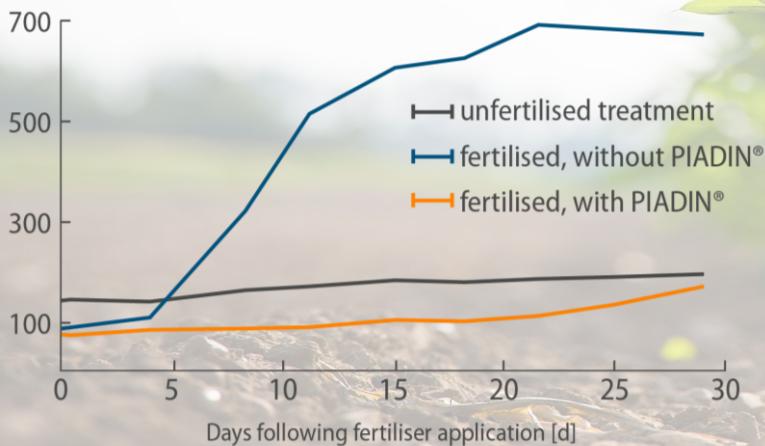
Results PIADIN® + StripTill



Modified by LWK NRW, Dr. Laurenz, Coesfeld

organic fertilisation

PIADIN® delays the conversion from ammonium to nitrate considerably

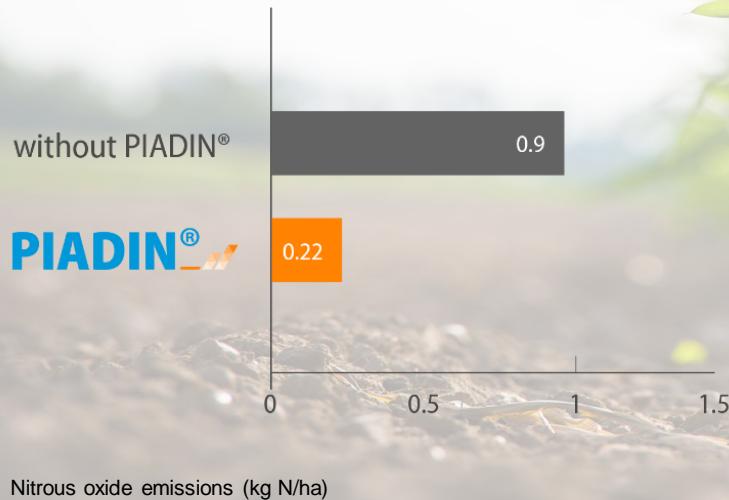


Laboratory experiment with slurry deposit (measurement in soil solution,
5 cm below slurry deposit)



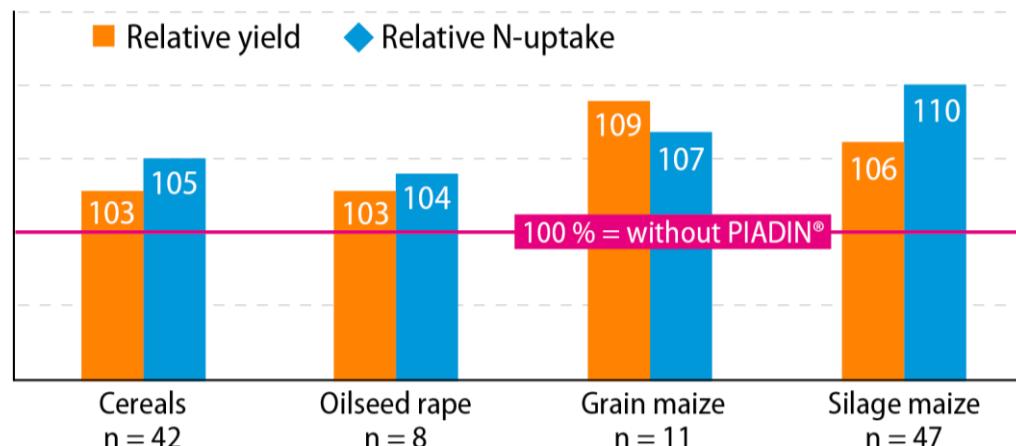
Organic fertilisation

PIADIN® reduces N₂O emissions by up to 75 %



PIADIN® = Higher yield and N-uptake

PIADIN® increases the yield and improves the N-uptake (relative)



Average of the years 2003 to 2016, N-uptake cereals/oilseed rape through corn, silage maize dry matter yield; liquid manure application in early spring 120 – 150 kg N/ha (30 – 50 m³); test results from various locations



Dosing and application times*:

Quantity in l/ha	February	March	April
Maize, sugar beet, potatoes	–	6 **	5 **
Grassland	5	4	–
Winter rye, winter barley, rapeseed	6	5	4
Winter wheat	7	6	5

The smaller the time gap between the application and the main N-uptake time of the plants, the lower the necessary PIADIN® application quantity.

* With all PIADIN® applications the time of fertilisation must be matched to the plant requirement in line with good professional practice.

** with Strip Till in the maize, only 3 l/ha of PIADIN® are needed

Effect of PIADIN® on N uptake/N efficiency



Effect of residues of biogas digestate with PIADIN® on N uptake and N efficiency in silage maize
(University of Munich, LPE Weihenstephan, 2007)

Biogas digestate*	N uptake (kg N/ha)	N efficiency(%)
Without fertilization	131,7	-
Superficial	166,4	31
Injection	218,6	78
Injection + PIADIN®	227,3	86
ALZON® 46	222,7	82

*dm: 6,95 %, N_t: 6 kg/m³, NH₄-N: 3,1 kg/m³
N-fertilisation: 111 kg N/ha (digestate NH₄-N)

Plant nutrition as needed



without

- » Reduce Nitrate, N₂O and N₂ by PIADIN®
- » More security for a higher yield and higher N uptake



Thank you for your attention

