Intelligent crop production

Active Farming

3C – the crop establishment concept

Hasbergen-Gaste trials site

Overview of the results

System techniques

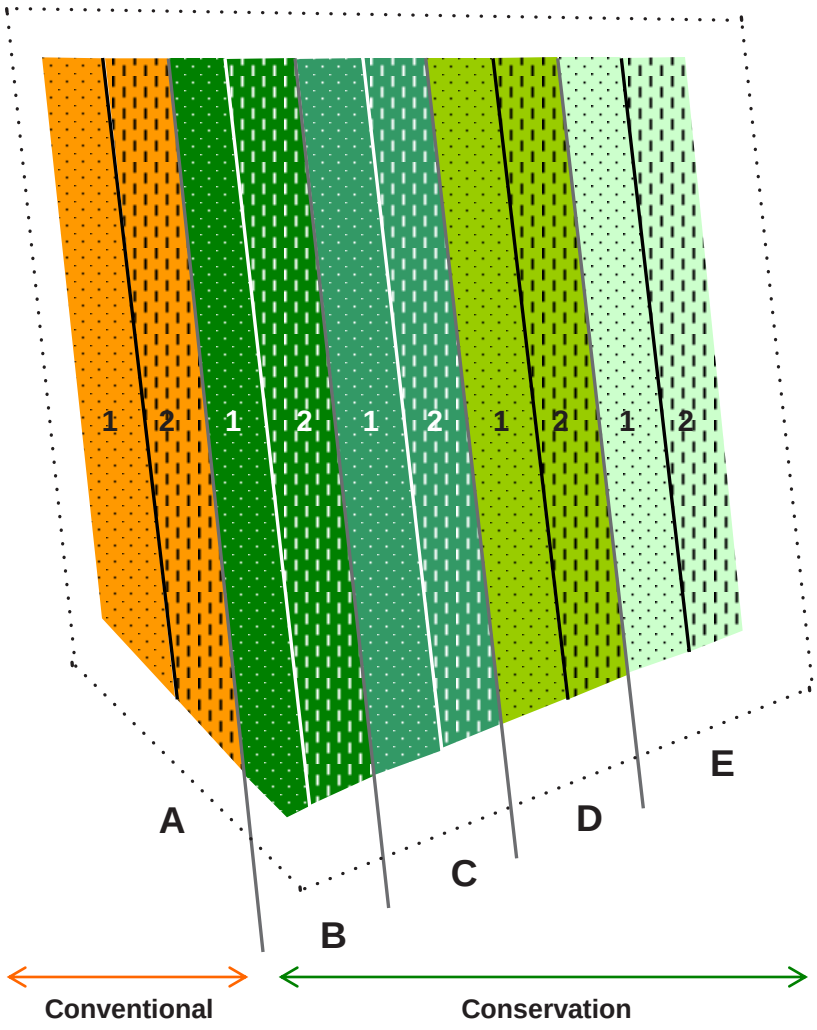
Details

Overview of the results: Hasbergen-Gaste tirals site

Aim of the trials:

Has conservation tillage, in sandy loam locations with improving soils, advantages over the plough?

Trials structure:



Drilling technology

KG-AD-P Super (active)

Cirrus (passive)

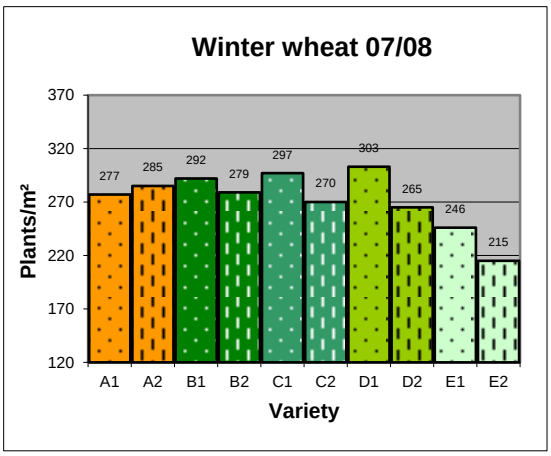
Plot A	Plot B	Plot C	Plot D	Plot E
Plough 25 cm	Mulch sowing 22 cm	Mulch sowing 15 cm	Mulch sowing 8 cm	Minimum mulch sowing

Initially, a stubble cultivation is carried out over all the plots with a compact disc harrow. Plot A is ploughed at a depth of 25 cm. In the min-till plots B and C, the soil tillage is carried out with a multi-row mulch cultivator at a depth of 22 cm and at 15 cm respectively. Plot D is worked again with the compact disc harrow at a depth of 8 cm. On plot E, only the initial stubble cultivation is carried out and then sowed straight after. Any further soil tillage is avoided on this plot.

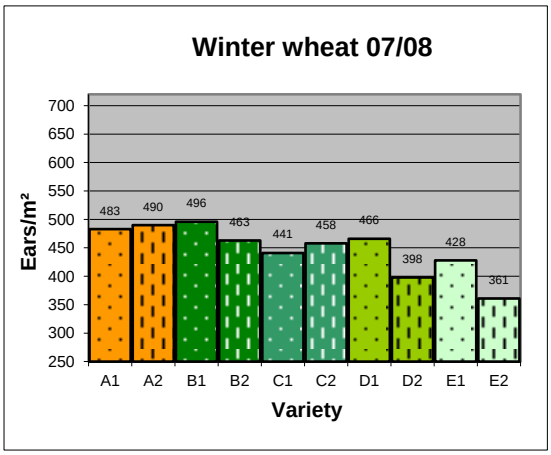
The different levels of intensity are also followed during drilling. In plots A1, B1, C1 and D1, an active seed drill combination is used whereas, in Plots A2, B2, C2 and D2, a passive seed drill is used.

Trials results 07/08:

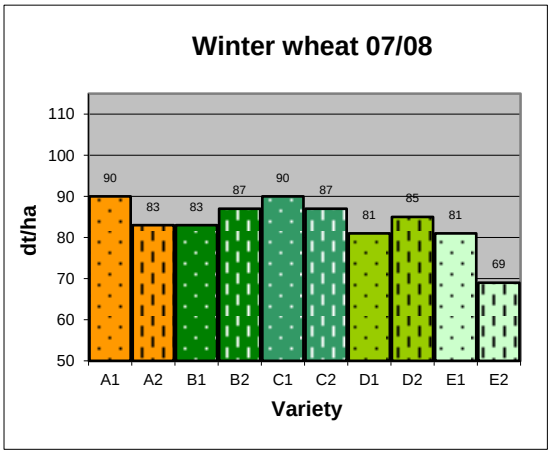
Plant emergence



Crop density

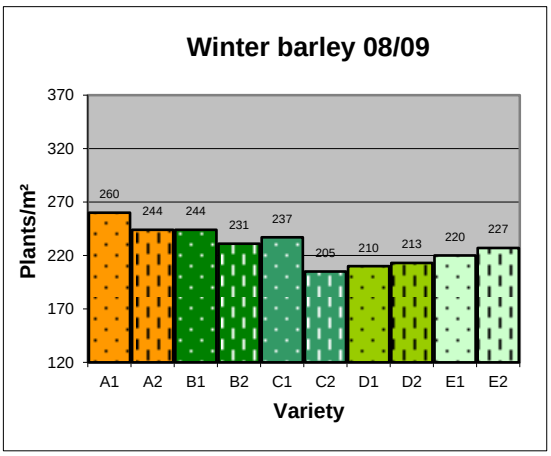


Yield

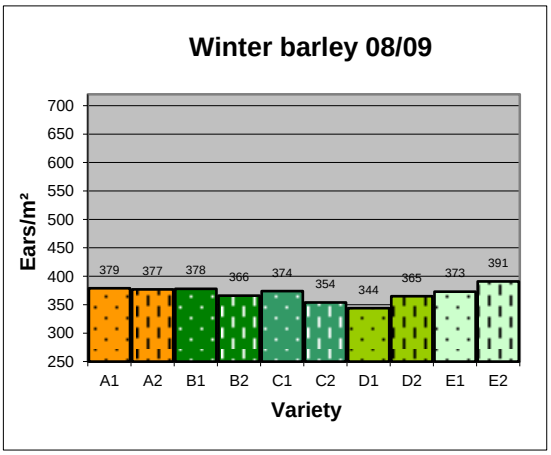


Trials results 08/09:

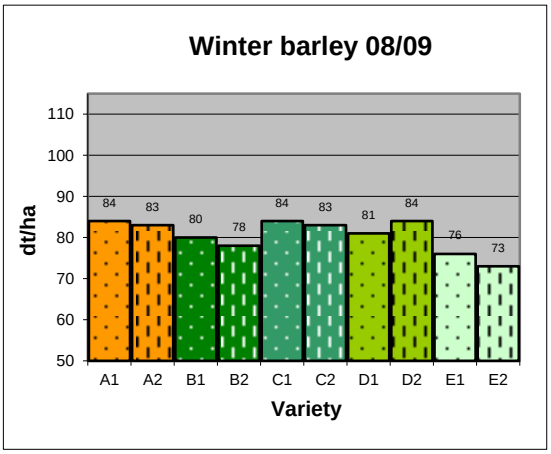
Plant emergence



Crop density



Yield



Trials results 2010:

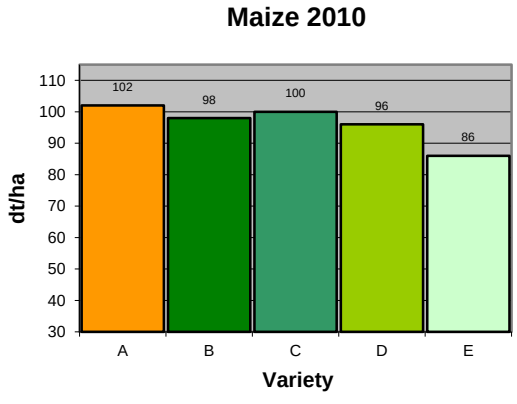
Plant emergence

Data not collected
in this trials year!

Crop density

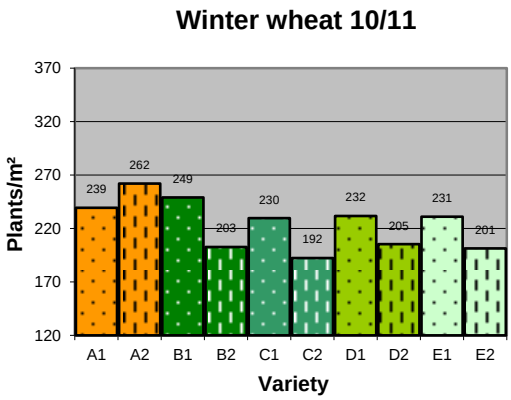
Data not collected
in this trials year!

Yield

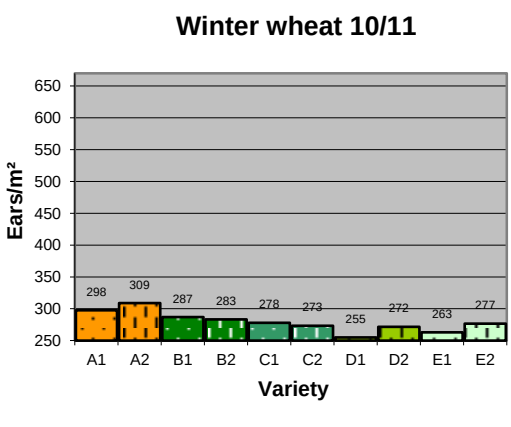


Trials results 10/11:

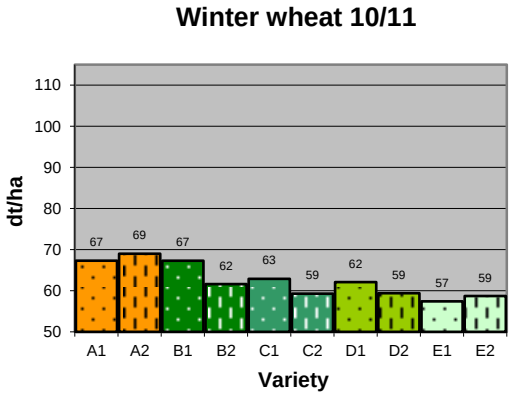
Plant emergence



Crop density



Yield



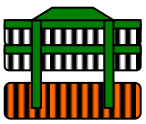
System techniques: Hasbergen-Gaste trials site

Trial plots for tillage, seedbed preparation and sowing

	Plot A Plough 25 cm		Plot B Mulch sowing 22 cm		Plot C Mulch sowing 15 cm		Plot D Mulch sowing 8 cm		Plot E Minimum mulch sowing	
	Plot A1	Plot A2	Plot B1	Plot B2	Plot C1	Plot C2	Plot D1	Plot D2	Plot E1	Plot E2
Mulching after maize	Flail mulching machine									
Stubble working	Catros, working depth 6 cm									
Tillage	Plough 25 cm Catros		Cenius 22 cm		Cenius 15 cm		Catros 8 cm		-	
Seedbed and seeding cereals	KG - AD-P Super	Cirrus	KG - AD-P Super	Cirrus	KG - AD-P Super	Cirrus	KG - AD-P Super	Cirrus	KG - AD-P Super	Cirrus
Seed maize	EDX									

decreasing tillage intensity

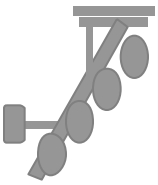
Stubble cultivation



Catros in A, B, C, D & E

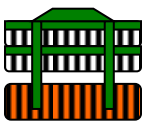
Mulched after maize in A, B, C, D & E

Soil tillage



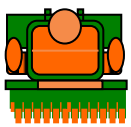
Plough in A

Cenius in B & C

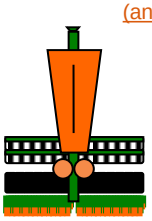


Catros in D
(and in A after the plough)

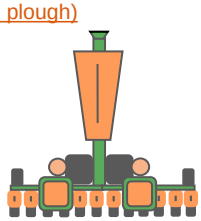
Sowing



AD-P Super in A1, B1, C1, D1 & E1

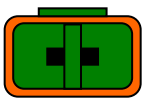


Cirrus in A2, B2, C2, D2 & E2



EDX for maize in A, B, C, D & E

Fertilisation



ZA-M in A, B, C, D & E

Crop protection

UF in A, B, C, D & E

AMAZONE trials at Hasbergen-Gaste (Lower Saxony)

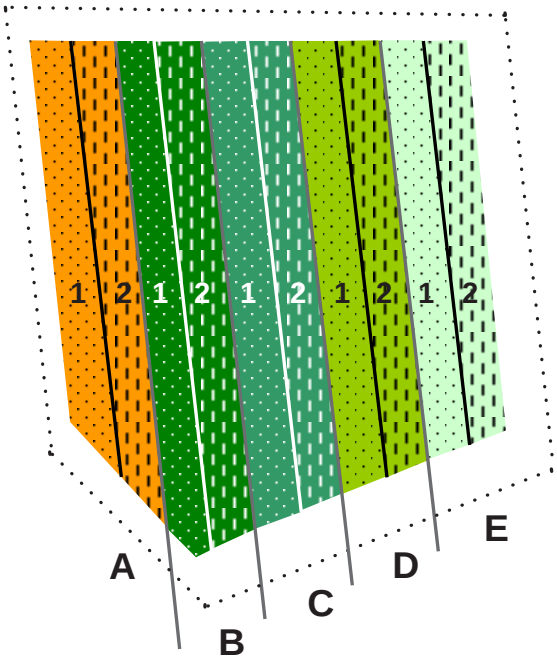
The trial site Hasbergen-Gaste is situated at the Southern foothills of the Weser-Ems region and is climatically influenced by the mountain range of the Teutoburger Forest situated further in the South and running from West to East. The average annual rainfall is about 800 mm, whereby the rainfall distribution is normally well balanced. In the last three years, however, drought prevailed during the months of April and May.

The region with predominantly sandy sites is characterised by mixed farming with animal husbandry which is reflected in the field sizes and the crop rotation. The soil conditions on the trials plot are heterogeneous. Sandy loam prevails, but there are also pure sand and pure loam areas which can clearly be recognised after drought.

The table represents the layout of the trial plots, which mirrrors the classic structure of all AMAZONE's trials work. The soil tillage is carried out in five different levels of intensity, from the classically conventional variant A, via the conservation tillage variants with some deep loosening (B, C and D), through to the conservation tillage variant E without any deep loosening which corresponds, with regard to the intensity of cultivation, to a minimal mulch sowing system.

At first stubble cultivation to a maximum depth of 6 cm is performed on the entire area to control weeds and volunteer grain. Sowing is carried out by means of active and passive sowing equipment adjusted to meet the site requirements. A solo seed drill is not used at this site on purpose.

Layout of the trials site on the farm of Norbert Pott in Hasbergen-Gaste



Plot A is worked conventionally with the plough, whereas plots B, C and D follow a min-till conservation tillage regime. In each case, the plots are sown with 2 varieties.

Stubble cultivation across all plots with a Catros compact disc harrow (6 cm depth).

Differentiated primary tillage to different depths with plough, mulch cultivator and compact disc harrow.

Sowing with rotary cultivator/seed drill combination (KG-AD-P Super, active sowing equipment) and trailed Cirrus Special seed drill (passive sowing equipment)

Site data	
Soil	Sandy loam, agricultural land grade 60
Climate	Annual rainfall 800 mm, average temperature: 9.0°C
Crop rotation	Winter wheat, winter barley, silage maize, winter wheat, winter barley, winter rape
Tramline width	15 m

Trial results in an overview:

Like on many other trial sites the yield level in Hasbergen-Gaste is primarily influenced by the type and intensity of the primary tillage.

On this site, apart from the conventional tillage, the conservation tillage at a working depth of around 15 cm seems to be the right choice across the average of the years to suit the peculiar heterogeneity of the soil.

When the soils are ready for sowing after tillage (fine soil particles) the intensity of further cultivation during sowing is completely irrelevant.

Trial plots for tillage, seedbed preparation and sowing

	Plot A Plough 25 cm		Plot B Mulch sowing 22 cm		Plot C Mulch sowing 15 cm		Plot D Mulch sowing 8 cm		Plot E Minimum mulch sowing	
	Plot A1	Plot A2	Plot B1	Plot B2	Plot C1	Plot C2	Plot D1	Plot D2	Plot E1	Plot E2
Mulching after maize	Flail mulching machine									
Stubble working	Catros, working depth 6 cm									
Tillage	Plough 25 cm		Cenius 22 cm		Cenius 15 cm		Catros 8 cm		-	
	Catros									
Seedbed and seeding cereals	KG - AD-P Super	Cirrus	KG - AD-P Super	Cirrus	KG - AD-P Super	Cirrus	KG - AD-P Super	Cirrus	KG - AD-P Super	Cirrus
Seed maize	EDX									

decreasing tillage intensity

Yield results (dt/ha) in comparison

	Plot A Plough 25 cm		Plot B Mulch sowing 22 cm		Plot C Mulch sowing 15 cm		Plot D Mulch sowing 8 cm		Plot E Minimum mulch sowing	
	Plot A1	Plot A2	Plot B1	Plot B2	Plot C1	Plot C2	Plot D1	Plot D2	Plot E1	Plot E2
Winter wheat 07/08										
Seed rate seeds/m²	365 (variety Hermann)									
Seedling emergence (plants/m²)	277	285	292	279	297	270	303	265	246	215
Crop density (ears/m²)	483	490	496	463	441	458	466	398	428	361
Yield dt/ha	**90**	**83**	**83**	**87**	**90**	**87**	**81**	**85**	**81**	**69**
Winter barley 08/09										
Seed rate seeds/m²	300 (variety Fredericia)									
Seedling emergence (plants/m²)	260	244	244	231	237	205	210	213	220	227
Crop density (ears/m²)	379	377	378	366	374	354	344	365	373	391
Yield dt/ha	**84**	**83**	**80**	**78**	**84**	**83**	**81**	**84**	**76**	**73**
Maize 2010										
Seed rate seeds/ha	86,000 (variety Sensation)									
Yield dt/ha	**102**		**98**		**100**		**96**		**86**	
Winter wheat 10/11										
Seed rate seeds/m²	350 (variety Glaucus)									
Seedling emergence (plants/m²)	239	262	249	203	230	192	232	205	231	201
Crop density (ears/m²)	298	309	287	283	278	273	255	272	263	277
Yield dt/ha	**67**	**69**	**67**	**62**	**63**	**59**	**62**	**59**	**57**	**59**

The yield results were determined in co-operation with PD Dr. Voßhenrich from vTI Braunschweig

Comment on trials results in Hasbergen-Gaste

by Dr. Sven Dutzi, AMAZONEN-WERKE

Up to now the four year results show that the site can provide stable, high yields both in the conventional and conservation tillage. The working intensity, however, plays a major role. So, the low intensity stage without loosening (plots E) of the soil results in inferior yields over the years. Besides the plough with a working depth of 25 cm (plots A), conservation tillage with a working depth of 15 cm (plots C) proves suitable to tap the full yield potential of the site.

If one compares the results from the different sowing techniques, tendencies become also obvious, however with narrower variability. The relevant differences of yield between active and passive sowing technology are clearly smaller than the differences between the variants with differing intensities in primary soil tillage.

In autumn 2010 followed the crop rotation of winter wheat after maize, the critical link. The actual yields, however, show that even this crop rotation step was still successful with conservation tillage. Surely, after a pass first with the mulcher (for field hygiene) and a choice of a less susceptible variety, the first important steps had already been made beforehand. The yields in 2011, after the difficult drilling conditions in 2010 and the long dry period between March and May are, on average, at a reduced level. The results of the study for the Mycotoxin content (DON and ZEA values) will be published in the next 2013 edition.