Intelligent crop production

Active Farming

3C – the crop establishment concept

Huntlosen trials site

Overview of the results

System techniques

Details

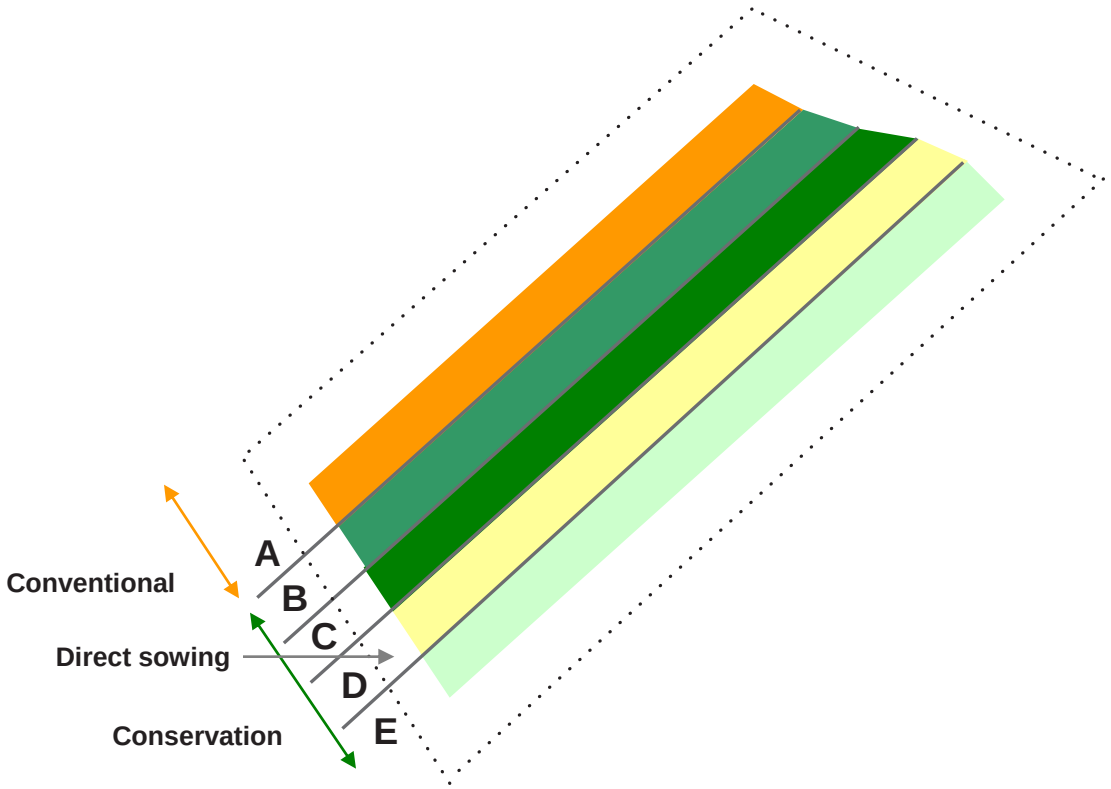
AMAZONE

Overview of the results: Huntlosen trials site

Aim of the trials:

Has conservation tillage, in sandy soil locations, advantages over the plough?

Trials structure:



Plot A	Plot B	Plot C	Plot D	Plot E
Plough 25 cm	Mulch sowing 15 cm	Mulch sowing 22 cm	Direct sowing	Minimal mulch sowing

The trials layout has followed different arable farming procedures with varying levels of intensity since 1994.

The stubble cultivation is generally carried out with a compact disc harrow.

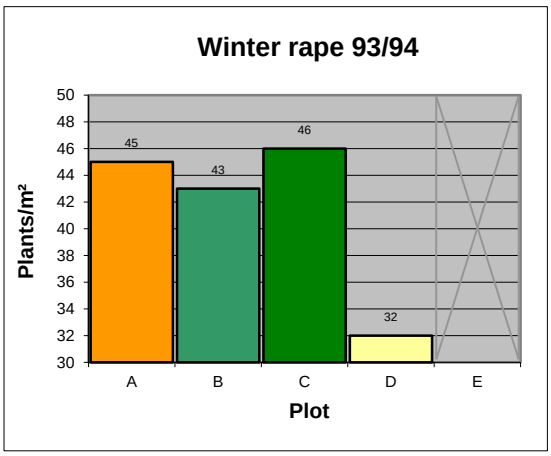
Whilst in plot A, for the basic soil tillage, the plough is used, it is disregarded in plots B-E.

Plot B is worked 5 cm deep with the rotary cultivator after the stubble cultivation. No further deep loosening has taken place since 1994. In plot C, it has been loosened just in the top soil, without being inverted. Plot D is worked as direct seeding, without any prior soil tillage whereas plot E differs merely in a stubble cultivation to plot D.

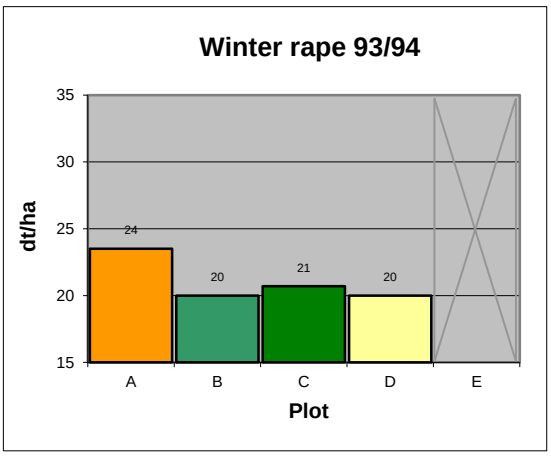
For the sowing technology, two systems are used. The one is an powered seed drill combination with a Pack-top drill. The other, in plots D and E, is a direct seed drill with chisel tip sowing coulters.

Trials results 93/94 – 1996:

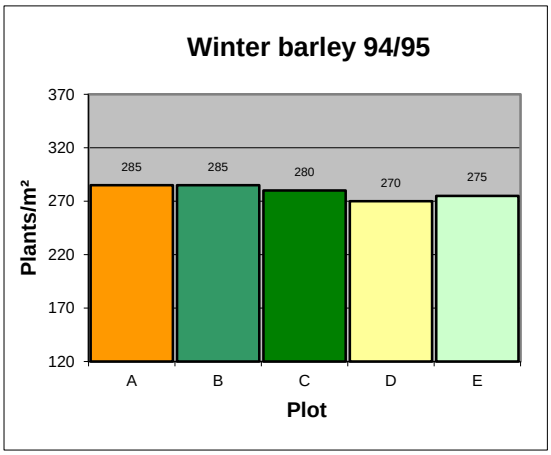
Plant emergence



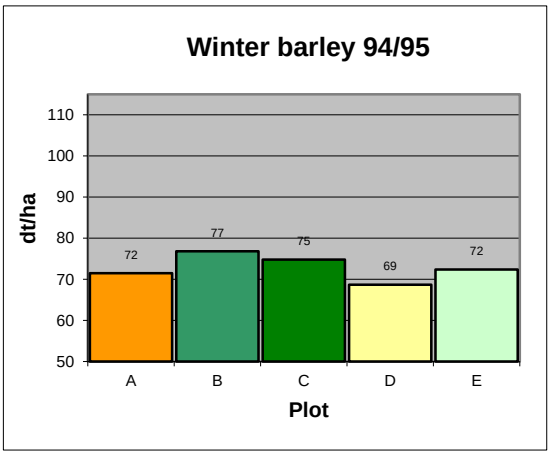
Yield



Plant emergence



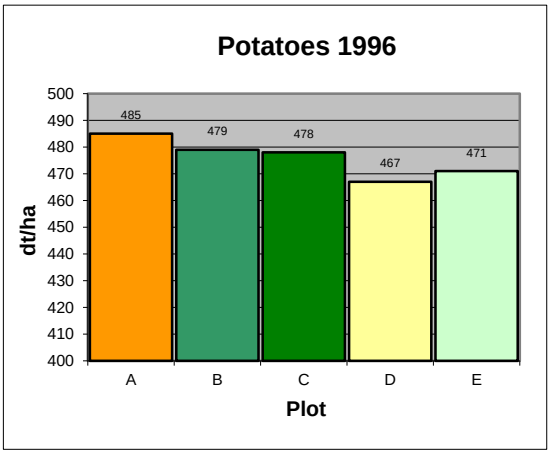
Yield



Plant emergence

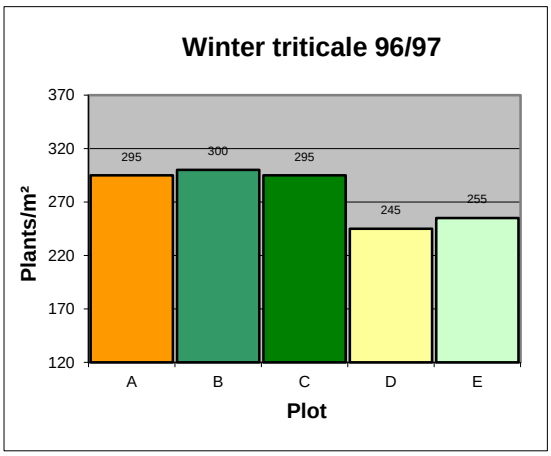
Data not collected
in this trials year!

Yield

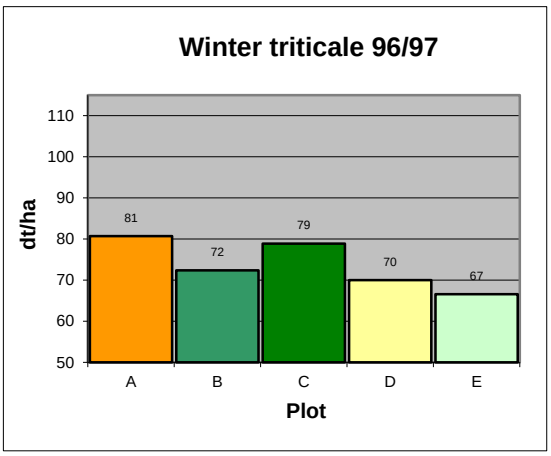


Trials results 96/97 – 96/99:

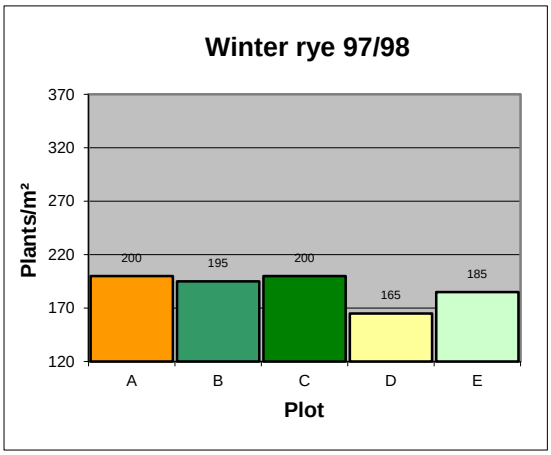
Plant emergence



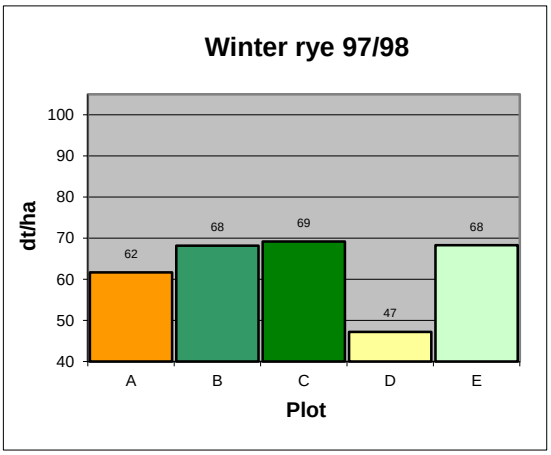
Yield



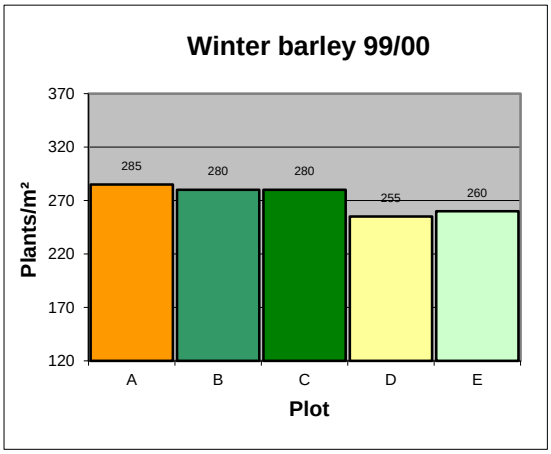
Plant emergence



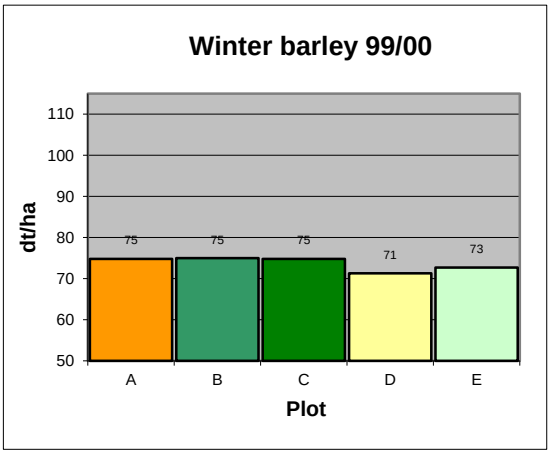
Yield



Plant emergence

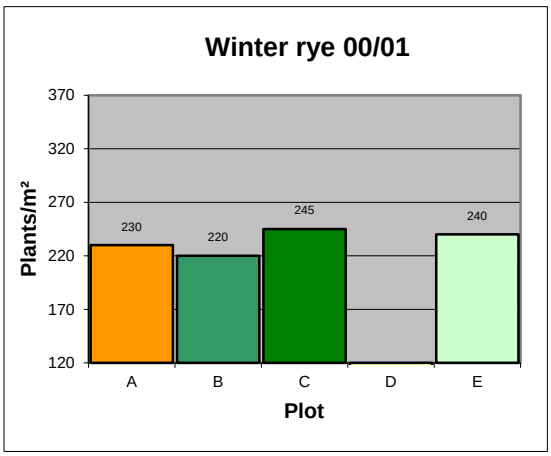


Yield

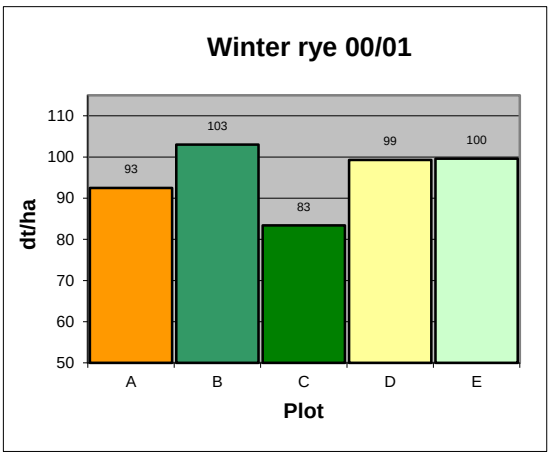


Trials results 99/00 – 2002:

Plant emergence



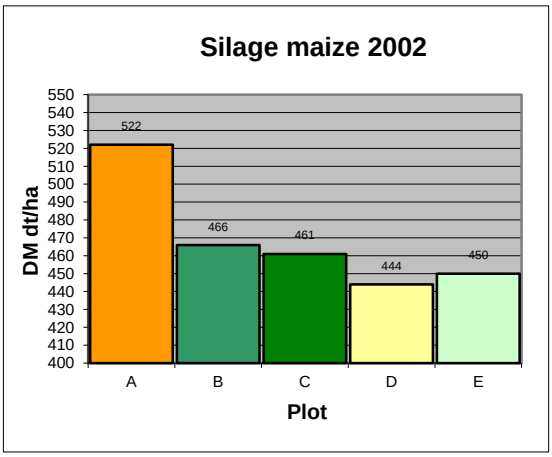
Yield



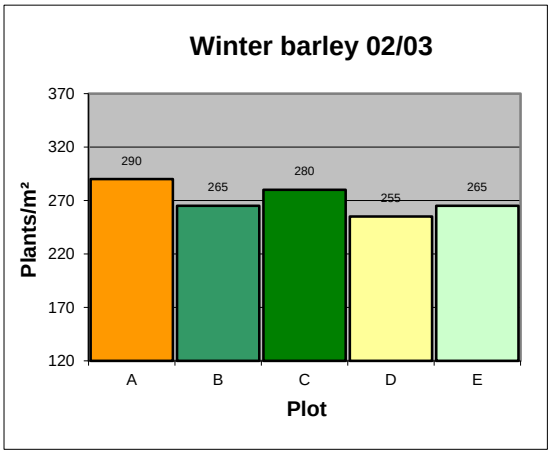
Plant emergence

Data not collected
in this trials year!

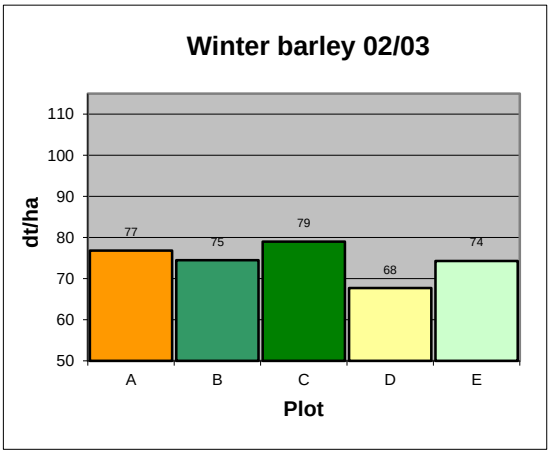
Yield



Plant emergence

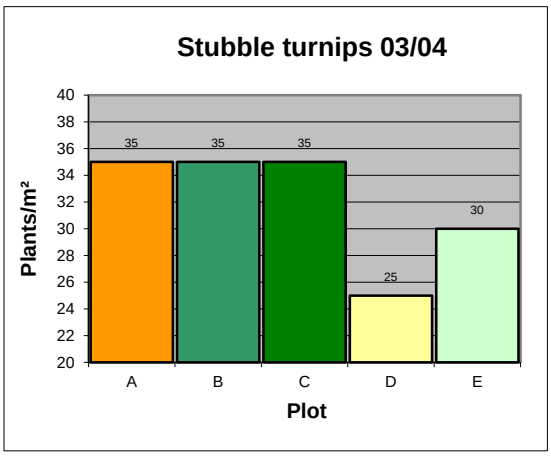


Yield

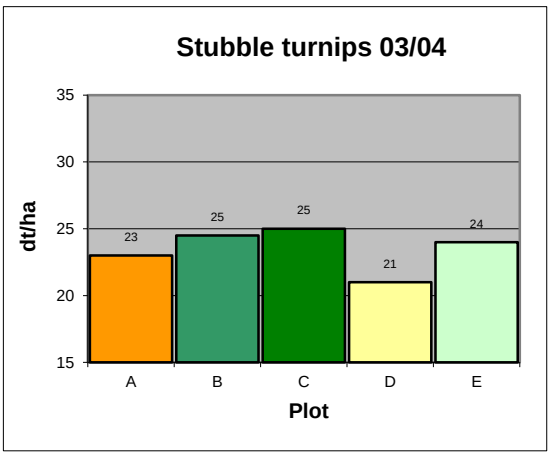


Trials results 02/03 – 04/05:

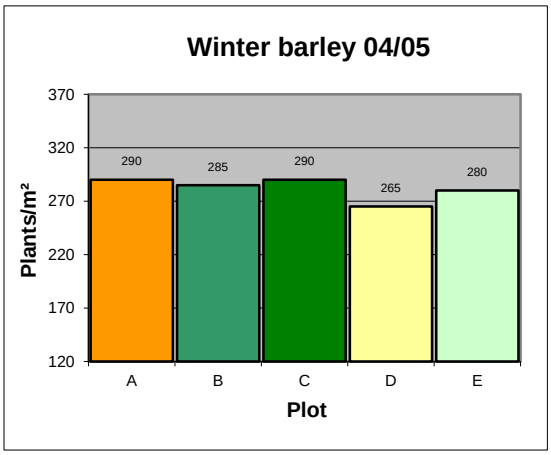
Plant emergence



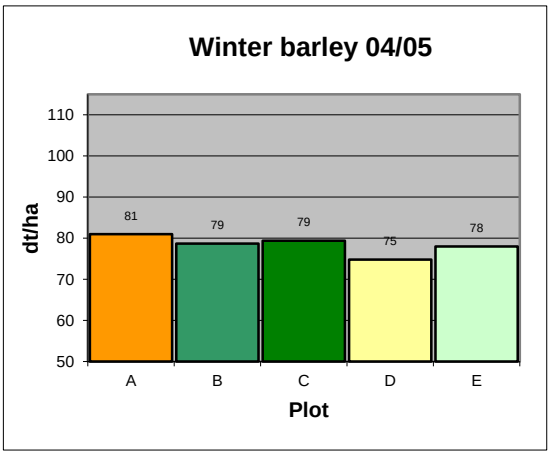
Yield



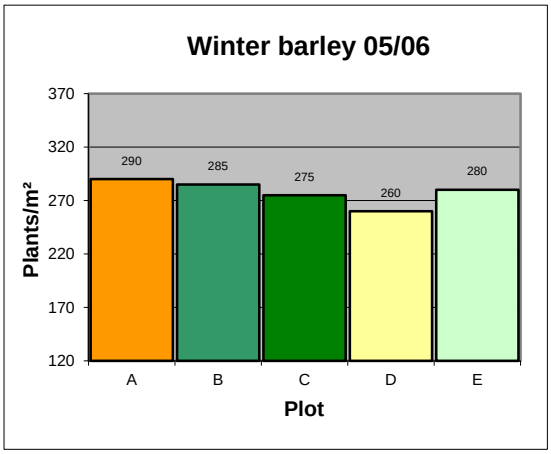
Plant emergence



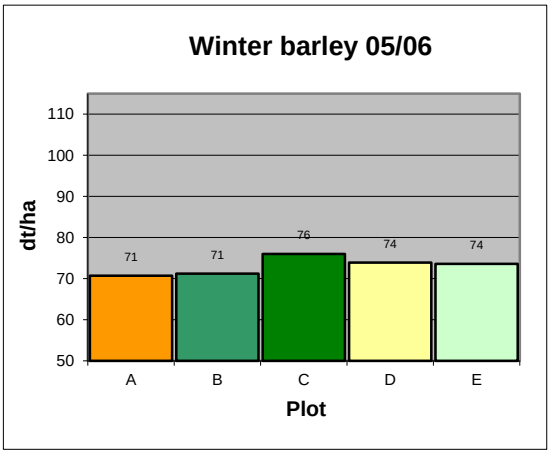
Yield



Plant emergence



Yield

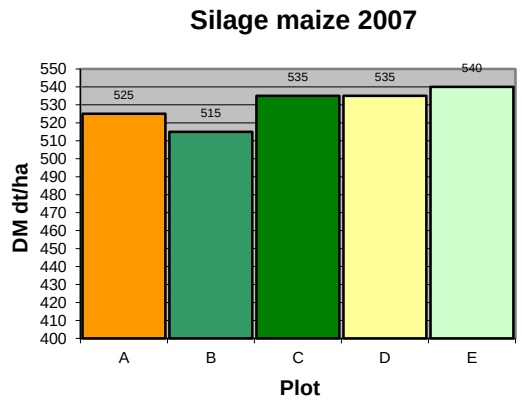


Trials results 05/06 – 07/08:

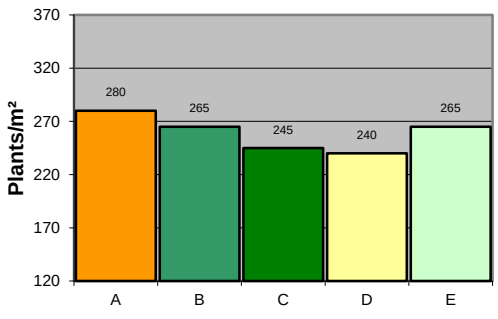
Plant emergence

Data not collected
in this trials year!

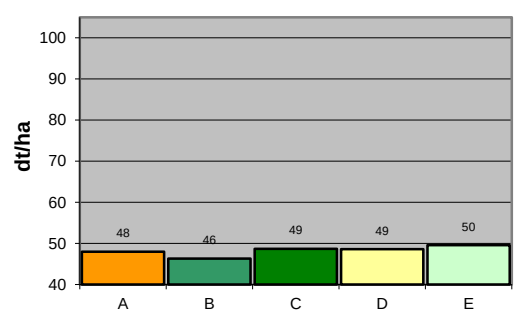
Yield



Plant emergence



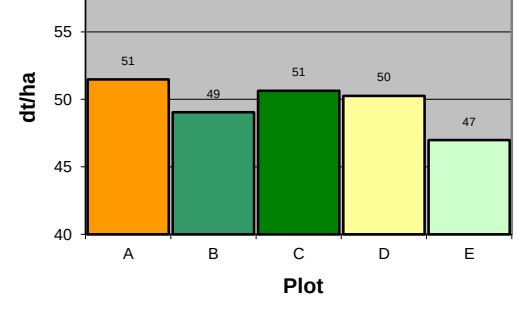
Yield



Plant emergence

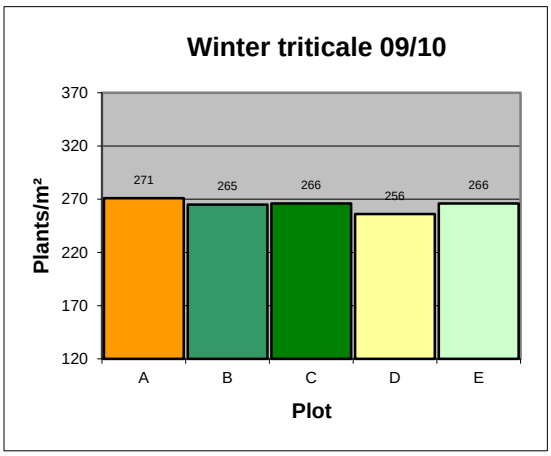
Data not collected
in this trials year!

Yield

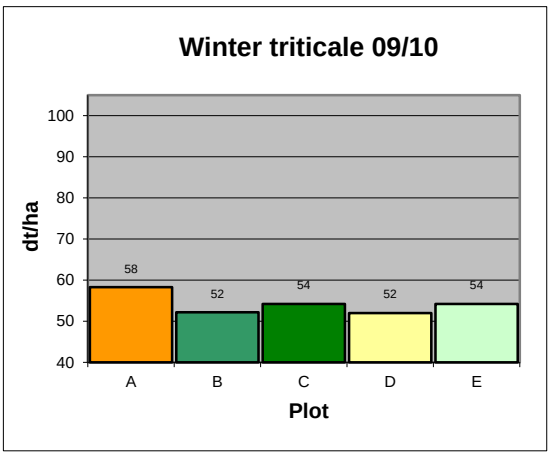


Trials results 08/09 – 10/11:

Plant emergence



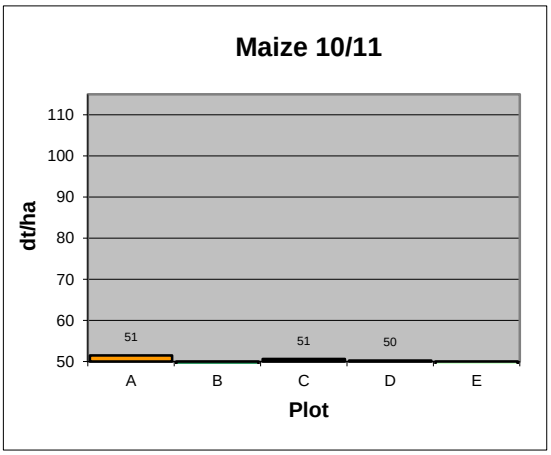
Yield



Plant emergence

Data not collected
in this trials year!

Yield

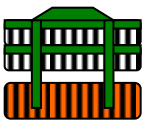


System techniques: Huntlosen trials site

Trial plots for tillage, seedbed preparation and sowing

	Plot A Plough 25 cm	Plot B Mulch sowing 15 cm	Plot C Mulch sowing 22 cm	Plot D Direct sowing	Plot E Minimal mulch sowing
Mulching after maize	Mulcher				
Stubble working	Catros 6 cm	Catros 6 cm	Catros 6 cm	-	Catros 6 cm
Tillage	Plough 25 cm Catros	KG - AD-P Super 15 cm	KG - AD-P Super with deep loosener 22 cm	-	-
Seedbed and seeding cereals	KG - AD-P Super			Primera	Primera
Seed maize	EDX				

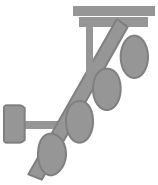
Stubble cultivation



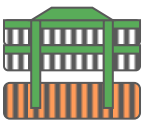
Catros in A, B, C & E

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

Soil tillage

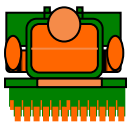


Plough in A

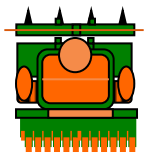


(Catros in A after the plough)

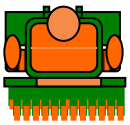
Sowing



KG AD-P Super in B

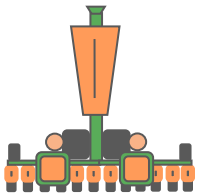


TL KG AD-P Super in C



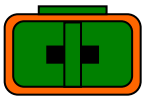
KG AD-P Super in A

Primera DMC in D & E



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

Fertilisation



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

Crop protection

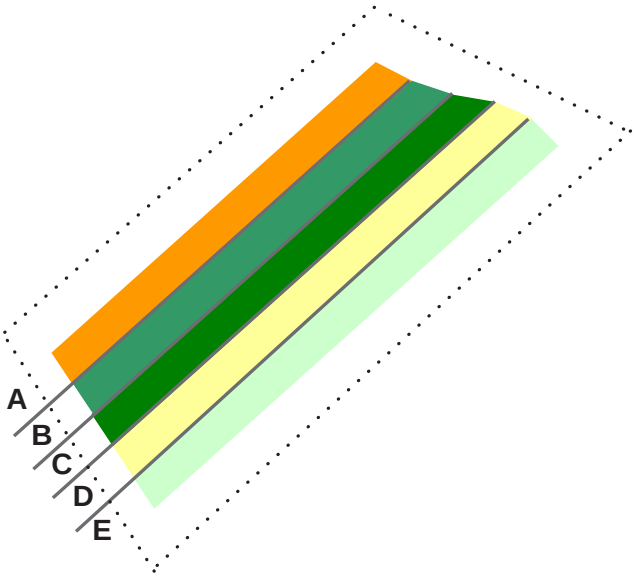
UF in A, B, C, D & E

AMAZONE trials at Huntlosen, Lower Saxony

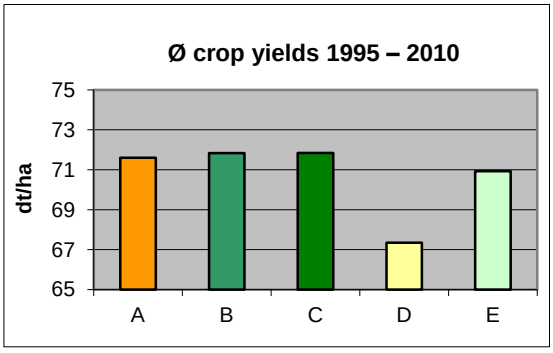
The Huntlosen site in Lower Saxony is representative of arable farming in mixed regions on light soils with small fields. The trials site is situated on the farm of Heiko Boning/Huntlosen. The approx. 100 ha size farm runs both an arable sector and pig fattening. Liquid manure is applied to the fields and the straw is completely removed. Besides the plough and conservation tillage plots also a direct sown plot was investigated in Huntlosen.

Site data	
Soil	Humus sand, 24 BP
Climate	Annual rainfall: 750 mm
Crop rotation	Changing crop rotation with: barley, rye, triticale, rape, turnips and maize
Tramline width	12 m

Division of the trial sites on the farm of Heiko Boning in Huntlosen



Plot A is conventionally cultivated with the plough, the plots B, C and E conservation tillage by mulch sowing and for plot D direct sowing.



Trials results in an overview:

Conservation soil tillage is possible as a the long term successful practice on light soils.

Mulch sowing exceeds the yield level of the plough plots.

Cereal mulch sowing resulted in the highest yields.

A broad crop rotation contributes decisively to the success of conservation systems.

Deep loosening during spring cultivations is an advantage.

Time-savings achieved through relinquishing the plough (and breaking those work peaks) are especially important for developing businesses.

Trial plots for tillage, seedbed preparation and sowing

	Plot A Plough 25 cm	Plot B Mulch sowing 15 cm	Plot C Mulch sowing 22 cm	Plot D Direct sowing	Plot E Minimal mulch sowing
Mulching after maize	Mulcher				
Stubble working	Catros 6 cm	Catros 6 cm	Catros 6 cm	-	Catros 6 cm
Tillage	Plough 25 cm Catros	KG - AD-P Super 15 cm	KG - AD-P Super with deep loosener 22 cm	-	-
Seedbed and seeding cereals	KG - AD-P Super			Primera	Primera
Seed maize	EDX				

Yield results (dt/ha) in comparison

	Plot A Plough 25 cm	Plot B Mulch sowing 15 cm	Plot C Mulch sowing 22 cm	Plot D Direct sowing	Plot E Minimal mulch sowing
Winter rape 93/94					
Seed rate seeds/m²	50				
Seedling emergence (plants/m²)	45	43	46	32	
Yield dt/ha	**24**	**20**	**21**	**20**	
Winter barley 94/95					
Seed rate seeds/m²	310				
Seedling emergence (plants/m²)	285	285	280	270	275
Yield dt/ha	**72**	**77**	**75**	**69**	**72**
Potatoes 1996					
Seed rate plants/m²					
Yield dt/ha	**485**	**479**	**478**	**467**	**471**
Winter triticale 96/97					
Seed rate seeds/m²	320				
Seedling emergence (plants/m²)	295	300	295	245	255
Yield dt/ha	**81**	**72**	**79**	**70**	**67**
Winter rye 97/98					
Seed rate seeds/m²	220				
Seedling emergence (plants/m²)	200	195	200	165	185
Yield dt/ha	**62**	**68**	**69**	**47**	**68**
Winter barley 99/00					
Seed rate seeds/m²	300				
Seedling emergence (plants/m²)	285	280	280	255	260
Yield dt/ha	**75**	**75**	**75**	**71**	**73**
Winter rye 00/01					
Seed rate seeds/m²	260				
Seedling emergence (plants/m²)	230	220	245	115	240
Yield dt/ha	**93**	**103**	**83**	**99**	**100**
Silage maize 2002					
Seed rate seeds/m²	85,000				
Seedling emergence (plants/m²)					
Yield DM dt/ha	**522**	**466**	**461**	**444**	**450**
Winter barley 02/03					
Seed rate seeds/m²	300				
Seedling emergence (plants/m²)	290	265	280	255	265
Yield dt/ha	**77**	**75**	**79**	**68**	**74**
Stubble turnips 03/04					
Seed rate seeds/m²	45				
Seedling emergence (plants/m²)	35	35	35	25	30
Yield dt/ha	**23**	**25**	**25**	**21**	**24**

Winter barley 04/05					
Seed rate seeds/m²	310				
Seedling emergence (plants/m²)	290	285	290	265	280
Yield dt/ha	**81**	**79**	**79**	**75**	**78**
Winter barley 05/06					
Seed rate seeds/m²	300				
Seedling emergence (plants/m²)	290	285	275	260	280
Yield dt/ha	**71**	**71**	**76**	**74**	**74**
Silage maize 2007					
Seed rate seeds/ha					
Seedling emergence (plants/m²)					
Yield dt/ha	**525**	**515**	**535**	**535**	**540**
Winter barley 07/08					
Seed rate seeds/m²	300				
Seedling emergence (plants/m²)	280	265	245	240	265
Yield dt/ha	**48**	**46**	**49**	**49**	**50**
Winter rape 08/09					
Seed rate seeds/m²					
Seedling emergence (plants/m²)					
Yield dt/ha	**51**	**49**	**51**	**50**	**47**
Winter triticale 09/10					
Seed rate seeds/m²	280				
Seedling emergence (plants/m²)	271	265	266	256	266
Yield dt/ha	**58**	**52**	**54**	**52**	**54**
Maize 10/11					
Seed rate seeds/m²					
Seedling emergence (plants/m²)					
Yield dt/ha					

Comment to the trials results in Huntlosen

by Dipl.-Ing. Jan Juister

Plough-less tillage is possible also on light, sandy soils. In the average of the years no decisive yield differences could be noted between mulch sowing and sowing following the plough. With mulch sowing, however, the highest gross margin was achieved. On the annual average over several years it was about 60 Euro higher than on the ploughed plot. Due to crop rotation, disease problems did not occur in the conservation tillage plots nor were any extreme changes in weed proliferation noted.

Saving working time plays an important role especially on intensively worked farms and also the reduced fuel consumption in case of conservation tillage is of great importance. The further advantages of mulch sowing, such as better traffic carrying ability of the soils, lower erosion and higher efficiency also had an effect in Huntlosen. It turned out that it is easier to do without deep loosening on good soils with adequate clay and humus content than on sandy soils with a low humus content or water logging.

Because the Huntlosen site is rich in humus it is possible to manage without deep loosening here. Nevertheless even this soil should be annually loosened at changing depths to avoid compaction and stratification. For growing maize, quick soil warming in spring is important, so that deep loosening in spring makes sense.