DLG Test Report 7266

Monosem

8-row precision planter ValoTerra Ultimate with ASG

with Fertismart fertilizer metering system
for combi planting

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Overview

A test mark “DLG-APPROVED for individual criteria“ is awarded for agricultural products which have successfully fulfilled a scope-reduced usability testing conducted by DLG according to independent and recognised evaluation criteria. The test is intended to highlight particular innovations and key criteria of the test object. The test may contain criteria from the DLG test scope for overall tests, or focus on other value-determining characteristics and properties of the test subject. The minimum requirements, test conditions and procedures as well as the evaluation bases of the test results will be specified in consultation with an expert group of DLG. They correspond to the recognised rules of technology, as well as scientific and agricultural knowledge and requirements. The successful testing is concluded with the publication of a test report, as well as the awarding of the test mark which is valid for five years from the date of awarding.

MONOSEM PRECISION PLANTER VALOTERRA ULTIMATE WITH ASG
✓ **Quality of work and accuracy of fertilizer metering**
✓ **Corn growth evenness at early stage**
DLG Test Report 7266

In 2022, the 8-row Monosem ValoTerra Ultimate corn planter with Fertismart fertilizer metering system was submitted to a DLG partial test which assessed “Quality of work including accuracy of fertilizer metering”. The test consisted of a lab test and a field test. In each of these two test versions the machine planted three corn varieties and DAP fertilizer.

The lab test tested the distribution of plants along the rows (accuracy of seed placement and distribution) plus the accuracy of fertilizer metering across the direction of travel. These tests were carried out on the stationary machine while simulating forward speeds between 8 km/h and 16 km/h.

The field test was carried out on 22 April 2022. The field was flat and the forward speeds ranged between 8 km/h and 16 km/h. The seedbed was described as fine tilth. The distribution of plants along the rows (accuracy of eventual crop spacing, accuracy of seed distribution) and spacings between the emerged plants were evaluated on 16 May 2022 using the DLG-owned mobile spacing meter. Afterwards, these measurements were evaluated statistically.

The partial test on “Corn growth evenness at early stage” was carried out in the same test field.
On 17 May 2022, the testers measured the growth height of 100 plants (EC13 3-leaf stage). Based on these measurements the coefficient of variation was then computed and assessed.

Other criteria were not tested.

Assessment in brief

The lab test

The standard deviations that were computed from the seed spacing measurements at the lab were assessed as “very good”.

The percentages of doubles and gaps were found to be “very low” and “low”.

The deviations between the actual fertilizer application rate and the set target rate ranged between -2.3 % (lower than the target rate) and 4.0 % (higher than the target rate). The metering accuracy across the direction of travel in all 15 test versions was rated as „very good“ according to the DLG assessment scheme.

The field test

Accuracy of eventual crop spacing and the field emergence rate were assessed as ‘very good’ in all test variants. The field emergence rates ranged between 90.1 % and 96.9 %. The percentages of target spacings were between 88.8 % and 96.6 %. The percentages of doubles were between 0.1 % and 0.9 %. The percentages of gaps were between 3.2 % and 10.9 %. The evenness of corn growth was measured in stage EC 13. In this evaluation, the corn stands were assessed as “uniform” in six out of nine test versions and as “not uniform” in three out of nine test versions. These gaps and the partly inhomogeneous plant growth are due to the cold soil temperatures at the time of sowing.

The 8-row planter Monosem ValoTerra Ultimate with Fertismart fertilizer metering system for combi planting performed impressively in all the tested aspects that were defined as test criteria in the underlying DLG test framework. Based on these results, the precision planter was awarded the DLG-APPROVED quality mark in the test module “Quality of work including accuracy of fertilizer metering” and “Corn growth evenness at early stage” at work rates of up to 16 km/h.

Table 1:
Overview of results

DLG QUALITY PROFILE		Assessment*
Test criterion “Quality of work”		
Lab test	Plant distribution along the rows	✓
	Accuracy of fertilizer metering	✓
Field test	Plant distribution along the rows	✓
	Field emergence	✓
	Corn growth evenness at early stage	✓

* Evaluation range: requirements fulfilled (✓) / requirements not fulfilled (✗)

The product

Manufacturer and applicant

Monosem
12, Rue Edmond Ribouleau
79240 Largeasse
France

Product:
8-row precision planter
Monosem ValoTerra Ultimate with ASG (Active Seed Guidance) and Fertismart fertilizer metering system for combi planting

Description and technical data

The machine submitted to the test was the 8-row Monosem ValoTerra Ultimate with ASG (Active Seed Guidance) and Fertismart fertilizer metering system for combi planting. According to the manufacturer, the machine is suitable for planting seeds into ploughed and min-till soils.

8-row Monosem ValoTerra Ultimate precision planter with ASG

The eight planter units are lined up on a box-section tube and are mounted in parallel linkages. Each planter unit has a 70-litre seed box and a 20-litre microgranule box. The granules are planted at a deeper level than the seeds by double-disc coulters that run ahead of the planter units. The planter units are double-disc coulters that cut the seed slots. Their discs have a furrow former arranged between them which consolidates and levels the soil in the seed slot in preparation of precision planting. The furrow former is followed by a brush belt that delivers the seeds from the singling unit into the slot. As the seeds drop off this belt, they are pressed into the slot by a press wheel. The press wheel is followed by two firming rollers that cover the slot, completing the seed placement.

The work depth of each planter unit is controlled by two gauge wheels. Seed depth, firming roller pressure and the ground pressure of the entire planter unit are controlled manually from specific levers and without tools. The pressure of the press wheel is also adjustable by a lever.

The seed singling system is based on the vacuum principle, which means a vacuum sucks the seeds into the holes in the electric singling disc where they remain for three quarters of a turn until the vacuum is cut when the hole is covered by a part of the disc casing. The seed drops from the hole and into a separate cell of the feeding wheel. Each of these cells has a flap which presses the seed into the brush belt that takes the seed to the slot and places it behind the furrow former.

Target spacings, doubles and gaps are displayed to the operator in percentage rates on the display screen. In addition, the screen reads out the coefficient of variation which is constantly being updated.

The operator enters either the target spacing or the target number of plants per hectare to the terminal.

*Fig. 2:
The planter in working position*

In general, the work rate of the seed singling unit is adapted automatically to the current forward speed of the tractor. The necessary data are supplied to the unit through the ISOBUS after it is collected by a GPS receiver or a radar speed sensor.

Monosem offers a choice of two seed singling discs:

– DV 3250 (5 mm holes)

– DV 3255 (5.5 mm holes)

The Monosem planter can be specified with an automatic and GPS-based shut-off system that closes individual planter units: When the tractor planter combination is approaching a skewed headland, the eight seed singling units and the fertilizer and microgranule metering system switch off automatically one after the other.

The dual-function blower which is driven mechanically by the tractor pto at up to 540 rpm generates an overpressure for the fertilizer application with Fertismart and a vacuum for the eight seed singling units.

A generator that is mounted behind the blower generates the energy that is required by the 33 motors on the machine – three on each per planter unit (driving the singling disc, the microgranule metering unit and the brush belt), eight on the fertilizer granules metering system on the tank, one operating the agitator shaft in the fertilizer tank.

Fertismart fertilizer metering system

The Fertismart fertilizer metering system is available with a 1,350-liter fertilizer tank. Based on the quantity filled into the hopper, its nominal filling level is con-

Fig. 3:
The planter in transport position

Fig. 4:
A planter unit viewed from the side

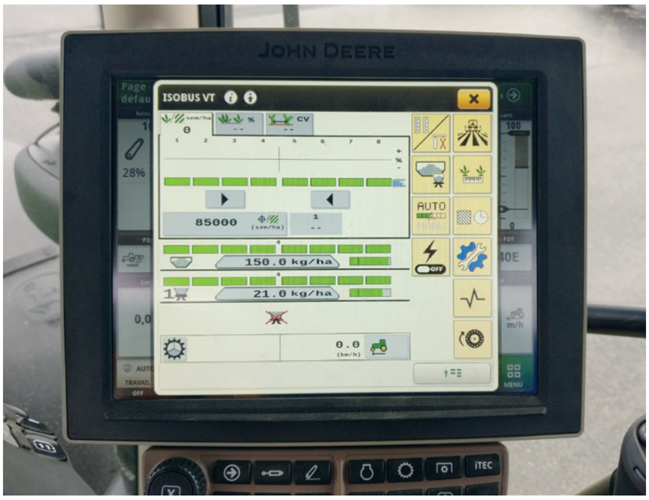

Fig. 5:
The John Deere 4640 operator terminal used in the test

Fig. 6:
The double-disc fertilizer coulter

stantly computed during work and indicated to the operator. Inspection windows or sensors are not available from Monosem.

The application rate is metered per row by means of a separate metering unit. Each of the eight metering units on the test machine had its separate motor.

The cyclical speed of the metering unit is matched to the current forward speed of the tractor. On our test machine, the forward speed was measured by the tractor-mounted GPS receiver and supplied to the unit through the ISOBUS.

The granules that are metered from the tank to the individual planter units and drop by gravity through flexible plastic tubes into the fertilizer coulters 3, 4, 5, 6 which are double-disc coulters located underneath the fertilizer tank. The granules destined for rows 1, 2, 7, 8 are delivered pneumatically. Each of these four fertilizer coulters has a cyclone separator. From here, the granules drop by gravity through a flexible plastic tube into the coulter running ahead of the planter and from here into the groove that runs 7 cm alongside the seed slot. The placement depth can be adjusted manually and separately on each individual coulter, which requires undoing two 19 mm nuts per coulter.

For calibration testing, the operator enters the appropriate parameters for the specific fertilizer application (including ground speed, application rate, target rate of the calibration testing tank). Then he or she selects the fertilizer coulter that is to be calibrated and places the calibration tray under this coulter. After that, calibration testing is started and the granules drop into the calibration tray. These are weighed and the result is entered to the terminal. The scales and the tray required are not supplied with the machine.

Standard specification is a light system that is approved for travel on public roads.

An option is the technology for using application maps for planting seeds, granules and micro-granules.

The method

The DLG test on “Quality of work including accuracy of fertilizer metering” is carried out at the lab (lab test) and in the field (field test).

The lab test

The lab test measures the accuracy of placement and distribution of seeds in direction of travel and accuracy of fertilizer metering at various forward speeds that are simulated on the stationary machine. The results are assessed using the DLG test framework for precision planters.

Accuracy of corn seed placement and distribution

To determine the accuracy of seed placement and distribution the testers install optical sensors to the seed outlet on the planter unit. This sensor technology measures the spacing between the individual seeds. Each test series consists of four test runs. In each of these runs, 250 seed spacings are created, which results in a total of 1,000 spacings per test series.

These 1,000 spacings and measurements are used to determine the accuracy of seed placement. This is done by computing the standard deviation (after correcting the doubles and missed areas). The result is assessed according to the current DLG test framework for precision planters. The standard deviation expresses the level of consistency of actual seed spacings. A smaller standard deviation figure means that the seeds are spaced more uniformly within the row.

Furthermore, the testers also use these 1,000 measurements to determine and assess the accuracy of distribution (percentages of target spacings, doubles and gaps).

Table 2: Accuracy of seed distribution

Accuracy of seed distribution	
Percentage of doubles [%]	< 0.5 times the actual spacing
Percentage of target spacings [%]	> 0.5 to < 1.5 times the spacing of the actual spacing
Percentage of missed areas [%]	> 1.5 times the spacing of the actual spacing
– one miss [%]	> 1.5 to < 2.5 times the spacing of the actual spacing
– two misses [%]	> 2.5 to < 3.5 times the spacing of the actual spacing
– three misses [%]	> 3.5 to < 4.5 times the spacing of the actual spacing
– four misses [%]	> 4.5 times the spacing of the actual spacing

In the lab test, all settings of the precision planter are logged (such as under/overpressure, metering disc fitted, stripper position).

Fertilizer metering accuracy

Further measurements include the bulk density of the fertilizer, the temperature and the humidity inside the lab.

The aim is to determine how much the actual application rate deviates from the target rate. This is done by conducting a number of tests with the machine parked up and the planters raised out of work while simulating various ground speeds and application rates.

Another machine parameter tested is the accuracy of fertilizer metering across the direction of travel. The granules are collected in a box that is placed under each coulter. Then the granules collected are weighed and used to compute the coefficient of variation (CoV). The smaller the coefficient of variation the more uniform is the actual rate of fertilizer applied across the work width. The computed coefficient of variation is then referenced to the DLG test framework work and evaluated. Last, the deviation between the actual rate applied per coulter and the mean actual rate across all coulters is also computed.

The maximum result of this calculation is identical with the maximum deviation.

The field test

Accuracy of eventual crop spacing, seed distribution and field emergence

The DLG test on “quality of work” requires the planting of at least three different corn varieties of different kernel forms at various ground speeds. It is good practice to carry out the test in two different fields. Before and during the test the field history (previous crop, previous tillage scheme), the conditions at the time of planting and the ground speeds are documented. The individual plots are marked out indicating the individual seed varieties sown here and a detailed test plan is drawn up.

The varieties sown are specified by variety, kernel type, breeder and thousand grain weight.

Soil samples are taken on the day the sowing takes place to determine the moisture levels in the seed placement layer and give an account of the test conditions. The soil moisture is determined to DIN 18121 standards.

The ability to germinate is determined in a lab test.

The accuracy of fertilizer placement in the soil is determined by taking random samples during work.

Then, 2 to 4 weeks after planting, the spacings between the young plants are measured using a mobile distance meter. To do this, 4 by 250 crop spacings are measured in each seed row and each test version (= 1,000 spacings). A test version is defined as the planting of one corn variety at a specific forward speed.

The spacings measured are then used to compute the accuracy of eventual crop spacing and distribution and field emergence. As a next step, the accuracy of eventual crop spacing and field emergence are referenced to the DLG test framework and given an assessment. The number of target spacings, doubles and missed areas are not assessed in the field test, because missed areas might be attributed to birds or the quality of seed bed preparation.

Corn growth evenness at early stage

In this test, the testers measured the growth height of 100 plants (EC13 3-leaf stage). Then the coefficient of variation was computed from these measurements and assessed in line with the DLG test framework for precision planters. These provides the following scores: very uniform, uniform, not uniform.

The planter dimensions are also measured in the test.

Detailed account of the test results

The following discusses the results of the lab test and the field test including the assessments.

The lab test

Accuracy of seed placement and distribution

The DLG lab test determined the placement and distribution accuracy of the following three corn varieties:

- Es Bond from Lidea (small round kernels; 252 g thousand grain weight)
- Es Traveler from Lidea (large round kernels; 352 g thousand grain weight)
- Es Myfriend from Lidea (tooth shaped kernels; 350 g thousand grain weight)

The test on placement and distribution accuracy was carried out by simulating the following forward speeds: 8 km/h, 12 km/h and 16 km/h. The target seed spacing was 14 cm. This was entered to the machine terminal (14 cm is the equivalent of 75 cm row spacings and 95,240 plants per hectare).

Table 3 shows the measurements on accuracy of seed placement and accuracy of distribution.
The standard deviation, which expresses the level of consistency in actual seed spacing, ranges between 4.58 mm and 9.43 mm. The accuracy of seed placement at all forward speeds (8, 12, 16 km/h) was assessed as “very good” for all these varieties.

Figure 7 shows the computed standard deviations as determined for the various forward speeds. The diagram shows that the following tendency was found in all three varieties: the standard deviation increases when forward speed increases. This means that the seed spacings become less uniform. Planting the variety Es Traveler (large, round seeds), the standard deviation was found to be not as high than in Es Myfriend (tooth-shaped seeds), which translates into more uniform spacings.

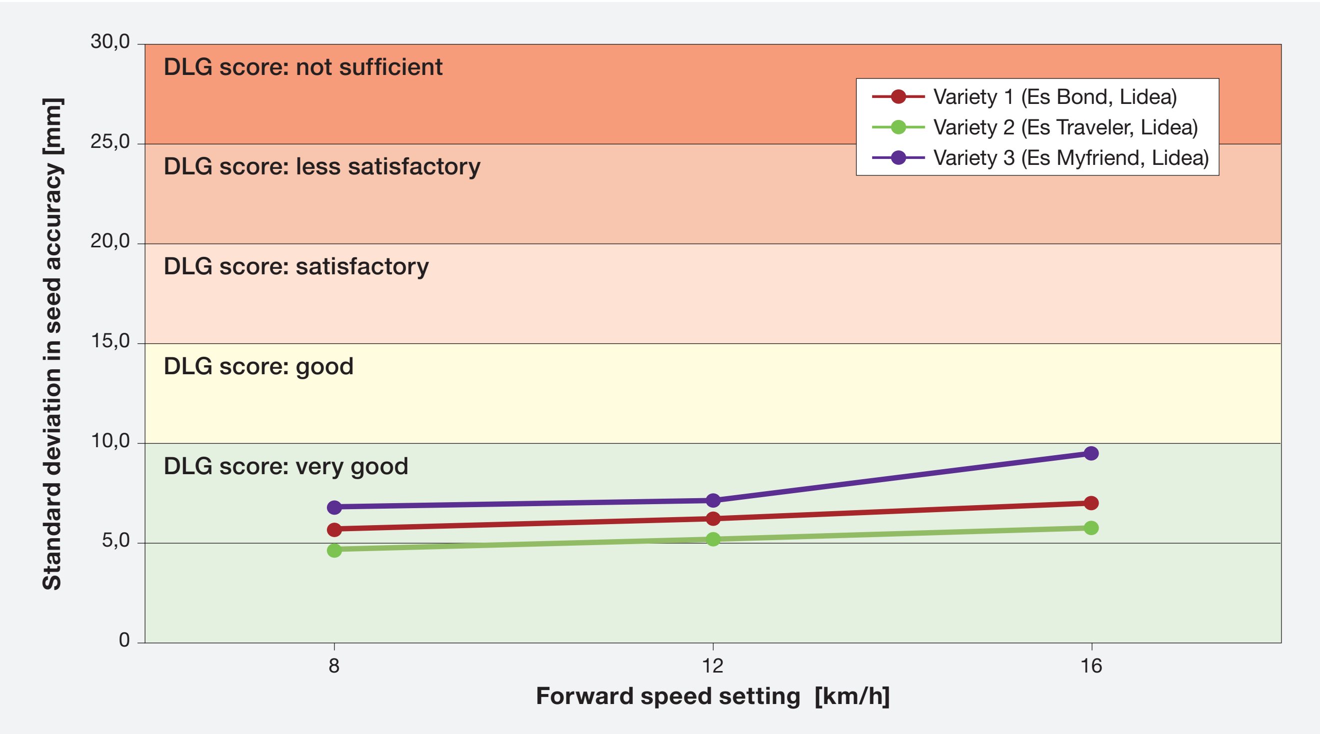

Fig. 7:
Lab tests: standard deviation in all three corn varieties relative to forward speed

Table 3 shows the percentages for target spacings, doubles and gaps. In all tests the percentage of doubles was between 0.1 % (very low) and 0.9 % (low). In all tests the percentage of gaps was between 0 % and 0.6 % (low). The percentages of gaps in Es Traveler (big, round seeds) were lower than in the other two varieties. The percentages of target spacings were between 98.5 % and 99.9 %. This applies to all lab test runs at all forward speeds and all varieties.

The measured seed spacings corresponded very well with the value set on the operating terminal.

Table 3:
The results on accuracy of seed placement and distribution (lab test)

Corn variety and forward speed	**Singling disc**	**SD* [mm]**	**SD assessment***	**Doubles [%]**	**Assessment of doubles**	**Target spacings [%]**	**Gaps (one miss) [%]**	**Gaps (two misses) [%]**	**Gaps (three misses) [%]**	**Gaps (four misses) [%]**	**Assessment of gaps**	**Target spacing [mm]**	**Actual spacing [mm]**
Es Bond, 8 km/h	DV 3250	5.66	very good	0.3	very low	99.3	0.4	0.0	0.0	0.0	very low	140	138.68
Es Bond, 12 km/h	DV 3250	6.19	very good	0.2	very low	99.5	0.3	0.0	0.0	0.0	very low	140	139.67
Es Bond, 16 km/h	DV 3250	6.95	very good	0.5	very low	99.2	0.3	0.0	0.0	0.0	very low	140	139.87
Es Traveler, 8 km/h	DV 3255	4.58	very good	0.1	very low	99.9	0.0	0.0	0.0	0.0	very low	140	138.77
Es Traveler, 12 km/h	DV 3255	5.15	very good	0.4	very low	99.5	0.1	0.0	0.0	0.0	very low	140	139.53
Es Traveler, 16 km/h	DV 3255	5.69	very good	0.4	very low	99.5	0.1	0.0	0.0	0.0	very low	140	139.86
Es Myfriend, 8 km/h	DV 3250	6.74	very good	0.9	low	98.5	0.6	0.0	0.0	0.0	low	140	138.64
Es Myfriend, 12 km/h	DV 3255	7.06	very good	0.5	very low	99.0	0.5	0.0	0.0	0.0	very low	140	139.66
Es Myfriend, 16 km/h	DV 3255	9.43	very good	0.6	low	99.0	0.4	0.0	0.0	0.0	very low	140	139.92

Assessment of standard deviations in the lab test:
≤ 10 mm = very good / > 10 - 15 mm = good / > 15 - 20 mm = satisfactory / > 20 - 25 mm = less satisfactory / > 25 mm = not sufficient

Assessment of doubles and gaps:
≤ 0.5 % = very low / > 0.5 - 2.5 % = low / > 2.5 - 5 % = tolerable / > 5 -7.5 % = high / > 7.5 % = very high

* = Standard deviation (SD)

The tests with Es Traveler were carried out with the vacuum set to 66 mbar.
The tests with Es Bond and Es Myfriend were carried out at a vacuum of 65 mbar.
The seed shutter was in position 3 in all these tests.

Fertilizer metering accuracy

The following fertilizer rates and work rates were applied in the DLG tests:

– 60 kg DAP fertilizer/ha at 8, 12, and 16km/h (nominal area covered: 0.5 hectare)

– 120 kg DAP fertilizer/ha at 8, 12 and 16 km/h (nominal area covered: 0.5 hectare)

– 200 kg DAP fertilizer/ha at 8, 12 and 16 km/h (nominal area covered: 0.2 hectare)

– 250 kg DAP fertilizer/ha at 8, 12 and 16 km/h (nominal area covered: 0.2 hectare)

– 300 kg DAP fertilizer/ha at 8, 12 and 16 km/h (nominal area covered: 0.2 hectare)

The DAP fertilizer (18 % nitrogen and 46 % phosphate) was supplied as granules with a bulk density of 929 kg/m^3*. The measurements were carried out in a hall at temperatures between 16.1 °C and 21.7 °C with the relative humidity ranging between 36.8 % and 46.7 %.

Table 4 shows the deviations between the target and the actual fertilizer application rates. These deviations were found to range between -2.3 % and 4.0 %. Some of the rates were negative, because in some test runs the target rate was smaller than desired. The highest deviation was 4.0 %. Here the target application rate was 60 kg DAP and the forward speed 8 km/h.

Table 4 also shows the actual coefficient of variation on metering accuracy across the direction of travel in the lab tests. The coefficients of variation as determined in 15 tests ranged between 1.2 % and 3.0 %. This leads to an accuracy of fertilizer metering across the direction of travel that is assessed as “very good” (++) in all aspects.

The maximum deviation of the actual fertilizer rate applied by one coulter was between 1.87 % and 4.50 %. The maximum CoV was measured at an application rate of 300 kg/ha and a ground speed of 8 km/h.

Table 4:
The test results on accuracy of fertilizer metering (lab test)

Target application rate [kg/ha]	Ground speed [km/h]	Planted area [ha]	Actual application rate [kg/ha]	Deviation between target and actual rate [%]	CoV on assessing the metering accuracy across the direction of travel [%]	Assessment* of this CoV [%]	Maximum deviation [%]
60	8	0.5	62.42	4.0	2.6	++	3.97
60	12	0.5	60.24	0.4	2.5	++	3.77
60	16	0.5	59.92	-0.1	2.1	++	3.23
120	8	0.5	119.69	-0.3	1.7	++	2.80
120	12	0.5	118.31	-1.4	1.2	++	1.87
120	16	0.5	117.74	-1.9	1.4	++	2.89
200	8	0.2	199.33	-0.3	1.4	++	2.31
200	12	0.2	195.50	-2.3	1.4	++	2.43
200	16	0.2	195.66	-2.2	1.6	++	2.50
250	8	0.2	254.48	1.8	2.4	++	4.01
250	12	0.2	249.82	-0.1	2.6	++	4.13
250	16	0.2	247.73	-0.9	2.5	++	3.92
300	8	0.2	303.88	1.3	3.0	++	4.50
300	12	0.2	299.77	-0.1	2.8	++	3.97
300	16	0.2	292.93	-2.4	2.6	++	3.68

* CoV assessment scheme: ≤ 3 % = ++ / ≤ 6 % = + / ≤ 10 % = ○ / > 10 % = –

The field test

Accuracy of eventual crop spacing, seed distribution and field emergence

The soil in the test field was loamy sand (35-40 soil value points). After a crop of winter barley was harvested on 20 July 2021 (yielding 69.6 dt/ha*, the straw being harvested), a mix of yellow mustard was sown on 24 August 2021. This cover crop was mulched in spring 2022. After applying 20 m^3/ha of cattle manure on 19 April 2022, the field was disced at a shallow depth of 6 cm to 8 cm. Two days before the corn was planted, cattle slurry was applied at a rate of 30 m^3/ha, followed by a 15 cm deep cultivation pass. The seedbed was described as fine tilth (fig. 8).

Fig. 8
The seedbed quality at the time of seeding

On 22 April 2022, the following three corn varieties were planted together with 100 kg/ha DAP fertilizer (10 °C soil temperature; 18 % soil moisture):

– Es Bond (Lidea), thousand grain weight: 252 g, germination capacity: 94 %

– Es Traveler (Lidea), thousand grain weight: 352 g, germination capacity: 97 %

– Es Myfriend (Lidea), thousand grain weight: 350 g, germination capacity: 98 %

The germination capacity as indicated above is the mean value averaged from two lab analyses and the percentage claimed by the manufacturer.

* 1 dt is the equivalent to 100 kg

Fig. 9:
Uncovered Es Traveler seeds planted at 16 km/h

The varieties were sown at the following forward speeds: 8 km/h, 12 km/h and 16 km/h. Afterwards, the testers randomly sampled the seed rows to verify the accuracy of seed placement. Figure 9 shows a patch of exposed ES Traveler seeds after they were planted at a forward speed of 16 km/h.

The granules were planted in bands by the fertilizer coulter. The testers verified the granule placement accuracy by taking random samples. They found that actual and target placement was identical (7 cm next to and 5 cm below the corn seeds).

During the three weeks before the seeding there was 42.5 mm rainfall. Another 27.1 mm of rain fell between 22 April 2022 (the date of planting) and 16 May (the date on which the crop spacings were evaluated). At the time of seeding, the soil moisture at seed depth level was 18 %.

The spacings between the emerged plants were measured on 16 May 2022. These results are shown in table 5.

The field emergence rates were always assessed as "very good" in all test variants and ranged between 90.1 % and 96.9 %. The accuracy of eventual crop spacing was also assessed as "very good" in all test variations.

All standard deviations in the eventual crop spacings in the field relative to the planter's forward speed are shown in figure 11. This graph shows that the field results are identical with the lab results: At 8 km/h, 12 km/h and 16 km/h, the accuracy of eventual crop spacing is assessed as "very good" without exception.

Table 5:
The test results on accuracy of eventual crop spacing, distribution and emergence (field test)

Corn variety and forward speed	Singling disc	SD* [mm]	SD assessment*	Doubles [%]	Target spacings [%]	Gaps (one miss) [%]	Gaps (two misses) [%]	Gaps (three misses) [%]	Gaps (four misses) [%]	Target spacing [mm]	Actual spacing [mm]	Field emergence [%]	Assessment of field emergence
Es Bond, 8 km/h	DV 3250	18.87	very good	0.1	92.9	6.4	0.6	0.0	0.0	140	134.25	93.3	very good
Es Bond, 12 km/h	DV 3250	20.24	very good	0.4	90.0	8.3	1.1	0.2	0.0	140	135.21	90.4	very good
Es Bond, 16 km/h	DV 3250	20.21	very good	0.3	89.5	9.2	0.9	0.1	0.0	140	135.32	90.8	very good
Es Traveler, 8 km/h	DV 3255	20.19	very good	0.3	92.6	6.8	0.3	0.0	0.0	140	135.43	93.6	very good
Es Traveler, 12 km/h	DV 3255	21.74	very good	0.3	90.7	8.4	0.6	0.0	0.0	140	136.06	91.6	very good
Es Traveler, 16 km/h	DV 3255	21.56	very good	0.3	88.8	9.7	1.0	0.2	0.0	140	136.08	90.1	very good
Es Myfriend, 8 km/h	DV 3250	20.90	very good	0.2	96.6	3.1	0.1	0.0	0.0	140	134.11	96.9	very good
Es Myfriend, 12 km/h	DV 3255	20.90	very good	0.9	94.3	4.7	0.1	0.0	0.0	140	134.70	95.6	very good
Es Myfriend, 16 km/h	DV 3255	20.56	very good	0.6	93.5	5.6	0.3	0.0	0.0	140	133.60	94.4	very good

Assessment of the standard deviations in the field:
≤ 25mm = very good / > 25 - 30 mm = good / > 30 - 35 mm = satisfactory / > 35 - 40 mm = less satisfactory / > 40 mm = not sufficient
Assessment of field emergence in corn:
≥ 90 % = very good / 89 - 85 % = good / 84 - 80 % = satisfactory / 79 - 75 % = less satisfactory / < 75 % = not sufficient

* = Standard deviation (SD)

The tests with Es Traveler were carried out with the vacuum set to 66 mbar.
The tests with Es Bond and Es Myfriend were carried out at a vacuum of 65 mbar.
The seed slider was in position 3 in all these tests.

The percentages of target spacings were 88.8 % and 96.6 % in the test. (The percentages of doubles and gaps in the field are not assessed in a DLG field test.) The percentages of doubles in this test were between 0.1 % and 0.9 %. The percentages of gaps were 3.2 % and 10.9 % across all test runs (table 5). In all three corn varieties the percentages of gaps increased when the forward speed increased.

Fig. 10:
Young Bond plants planted at 16 km/h on 17 May 2022

The evaluation of the crop spacings on 16 May 2022 revealed 45 gaps in the test field. These 45 gaps were uniformly distributed across all 9 test versions. In 37 from 45 gaps it was found that the seeds had been placed as targeted (82 %), which means an accurate job by the Monosem planter. The seeds that did not emerge and were exposed later on had not germinated or had stopped growing after germination. This said, no seeds were found in another eight gaps (out of 45 gaps) in the seed rows. This equals to 18 %.

Figure 10 shows the young plants on 17 May 2022 (ES Bond sown at 16 km/h).

Table 6 shows the results from the test module “Corn growth evenness at early stage”: minimum and maximum growth heights and the computed coefficient of variation based on the growth height of 100 plants. The consistency of growth height is assessed in the right column. The assessment is “uniform” in six out of nine seeding variations and “not uniform” in three out of nine variations.

The gaps discussed above and the occurrence of a “not uniform” growth height may be attributed to the early planting date and cold soil temperatures (10 °C at planting depth) which weakened seed viability and encourages infestation with pests. When evaluating these results, it is also necessary to look at the low and very low gap percentages of the lab test (0.6 % being the lowest percentage).

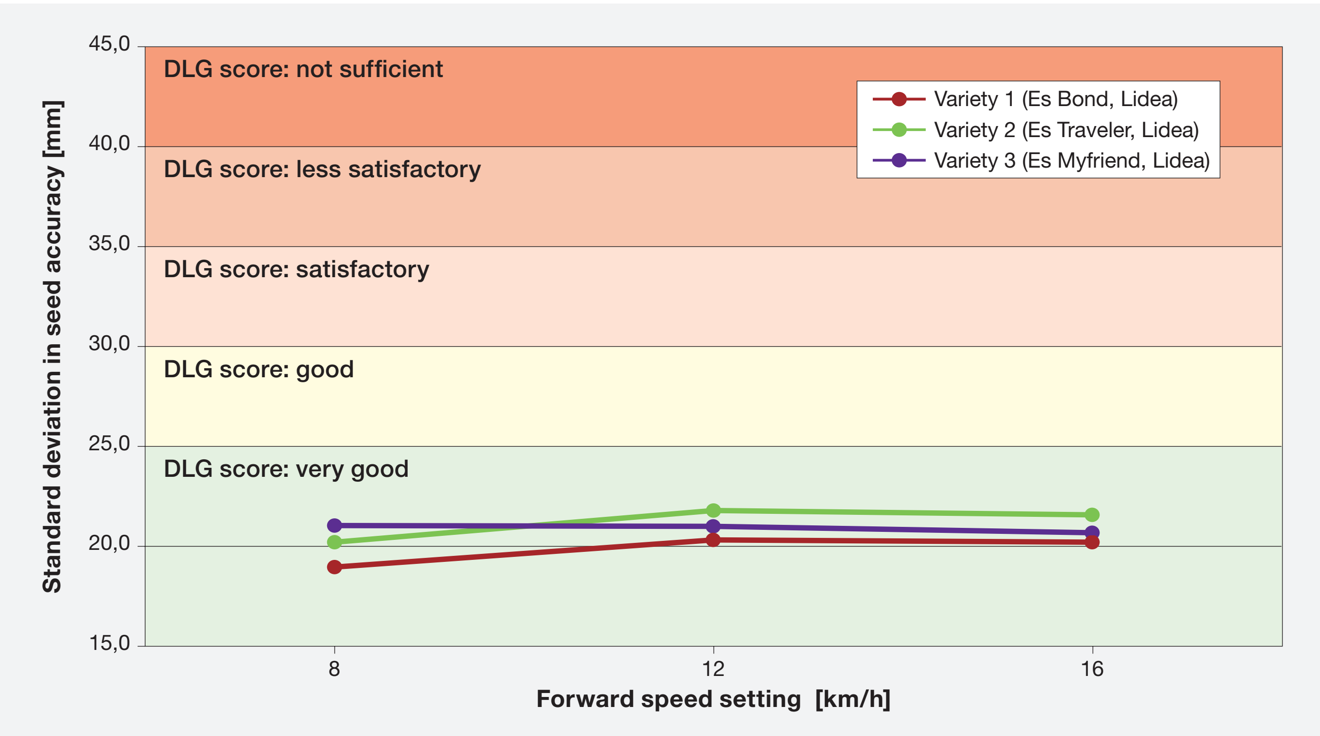

Fig. 11:
Field test: standard deviation in eventual crop spacing in all varieties relative to the set forward speed

Table 6:
Uniform early growth heights

Corn variety and forward speed	Minimum growth height [cm]	Maximum growth height [cm]	Coefficient of variation [%]	Assessing uniform growth height of the stand
Es Bond, 8 km/h	11	30	17.5	not uniform
Es Bond, 12 km/h	16	29	11.4	uniform
Es Bond, 16 km/h	8	30	19.5	not uniform
Es Traveler, 8 km/h	8	30	16.8	not uniform
Es Traveler, 12 km/h	10	28	14.7	uniform
Es Traveler, 16 km/h	15	32	13.0	uniform
Es Myfriend, 8 km/h	16	32	12.6	uniform
Es Myfriend, 12 km/h	15	31	12.5	uniform
Es Myfriend, 16 km/h	16	32	11.1	uniform

Assessing the coefficient of variation on uniform growth height:
≤ 7.5 % = very uniform / > 7.5 % to ≤ 15.0 % = uniform / > 15.0 % = not uniform

The dimensions of the test machine were taken during the DLG test. These are listed in table 7.

The tests with Es Traveler were carried out with the vacuum set to 66 mbar.

The tests with Es Bond and Es Myfriend were carried out at a vacuum of 65 mbar.

The seed slider was in position 3 in all these tests.

Table 7:
Dimensions of the tested precision planter

Dimensions	Measurement [m]
Machine length	2.50
Machine height in transport position (incl. bout markers)	3.64
Machine width in transport position	3.00
Machine width in work position	5.90

Summary

In the field test, the 8-row Monosem ValoTerra Ultimate with ASG achieved a “very good” accuracy in eventual crop spacing up to 16 km/h. Field emergence was also assessed as “very good” in all test variants. Emergence rates were between 90.1 % and 96.9 %. The percentages of target spacings were between 88.8 % and 96.6 %. The percentages of doubles were between 0.1 % and 0.9 %. The percentages of gaps were between 3.2 % and 10.9 %. The corn growth evenness was measured in stage EC 13. In this evaluation, the corn stands were assessed as “uniform” in six out of nine test versions and as “not uniform” in three out of nine test versions. The gaps and those plants that did not show a uniform growth height were mainly attributed to the cold soil temperature at the time of planting.

In the lab tests, the percentages of doubles and gaps in seven out of nine tests were found to be “very small”. The number of gaps was assessed as “very low” in eight out of nine tests.

The deviation between target and actual fertilizer rates was between -2.3 % and 4.0 %. The accuracy of fertilizer metering across the direction of travel in all test variants was assessed as „very good” (++).

Based on these test results, the 8-row Monosem ValoTerra Ultimate precision planter with ASG and the Fertismart fertilizer metering system is awarded the DLG-APPROVED quality mark 2022 in the test module “Quality of work including accuracy of fertilizer metering” and “Corn growth evenness at early stage” for work rates of up to 16 km/h.

Further information

Testing agency

DLG TestService GmbH,
Gross-Umstadt location, Germany

The tests are conducted on behalf of DLG e.V.

DLG test framework

Precision planters (date of issue 12/2020)

Department

Agriculture

Division head

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Test engineer(s)

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Photos and graphics

DLG and Monosem

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Internal test code DLG: 2201-0094

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