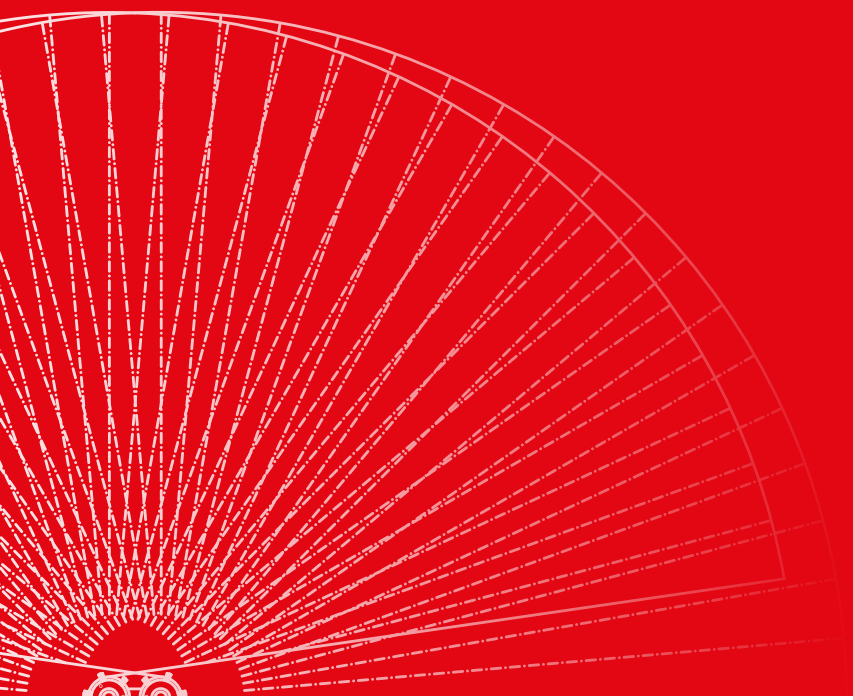
BREDAL

EN

MANUAL F2



> EU DECLARATION OF CONFORMITY

(Machinery Directive 2006/42/EC, Annex II, supplement A)

Manufacturer: BREDAL A/S
Nimvej 1
DK-7120 Vejle Ø

hereby declares that

BREDAL Type F2 serial number .....

is manufactured in conformity with the Machinery Directive (Directive 2006/42/EC), as amended, and with national provisions.

Bredal DK-7120 Vejle Ø August 2016

Anders Buhl

> THE SPREADER'S MASTER DATA

The spreader's rating plate specifies the model designation, year of manufacture, net weight, serial number and total weight.

Errors and omissions excepted.
The terms and conditions of sale and delivery can be found on www.bredal.com/en/betingelser

TABLE OF CONTENTS

Bredal F2 is designed to spread chemical fertilizers and similarly structured materials on farmland. The operator is responsible for ensuring that the machine is solely used for the intended purpose to avoid property damage and personal injury.

The machine is equipped with a rating plate on which the serial number and year of production are specified. The maximum gross weight and net weight are also specified on the rating plate. The difference between the two is the maximum permissible load.

This instruction manual contains instructions for operating the machine and setting it to spread generally available commercial fertilizers. As fertilizer quality can fluctuate greatly from one year to the next and from consignment to consignment, it is advisable to always perform a spreading test if there is any doubt whether the type of fertilizer can be spread on the preferred working width with reasonable results. The latest settings for the most common types of available fertilizer can be downloaded at any time from Bredal's website. It is advisable to always do a spreading test using the type of fertilizer to be spread to test the settings recommended by Bredal. The user is solely responsible for ensuring that the machine is correctly set and that it works correctly to achieve acceptable spreading. Bredal accepts no liability for spreading errors.

The safety distance from the spreading discs is at least 30 meters when these are rotating. If people or animals are within this distance, the tractor's PTO must be disengaged.

Never operate the headland gear or adjust the spreader while the spreading discs are rotating.

When loading the spreader, keep foreign objects, such as stones, etc., from getting in the machine's hopper, as they can cause damage and be very hazardous for the surroundings.

Sitting/standing on the machine while it is operating or during road transport is not permitted.

Before working on the machine, make sure to disengage the tractor's PTO and that the hydraulic system is depressurized.

Shields on PTO shafts and the implement must be intact and correctly attached.

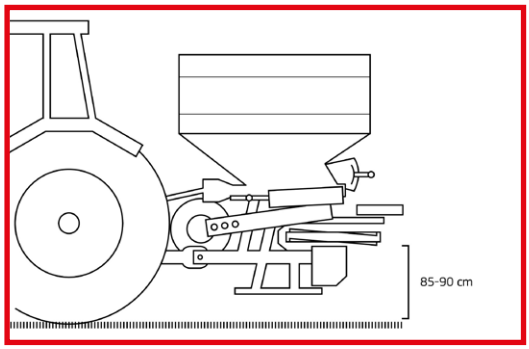
> TRAFFIC SAFETY

As traffic safety is important when driving on public roads, the following must be checked:

- The light system must be connected to the tractor's light socket, the lamps must be cleaned, and turning signals and brake lights must work correctly.
- Reflective warning triangles must be intact and clean.
- The size of the connector pins in the three-point hitch must be properly dimensioned and locked so that they cannot be ejected.

When connecting the spreader to the tractor, it is important that it is suspended horizontally or tilts slightly forward to obtain the best possible spreading results.

The spreader must not tilt backwards, not even when the hopper is full. The spreader must be mounted directly behind the tractor, i.e. perpendicular to the direction of travel, and it must be centered squarely on the tractor's central axis. The stabilizer chain assemblies must be fully tightened.



The spreading discs' height above crops must be approx. 85–90 cm.

The hydraulic hoses for operating the application wheel are connected to a dual-action outlet.

The light plug is inserted in the tractor's light outlet.

Connect the PTO shaft to the tractor's PTO.

SETTING THE APPLICATION WHEEL

To connect, attach the spreader's hydraulic hose to the tractor's hydraulic outlet. Engaging and disengaging the application will now be done using the tractor's hydraulic system. A pilot-operated check valve is installed. This prevents the application wheel from being accidentally engaged if there is a leak in the tractor's hydraulic system.

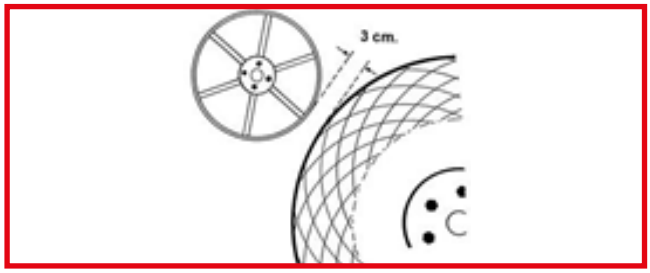
The driving-dependent belt drive has the feature of enabling the forward speed to be freely selected without affecting the application rate set in liters/hectare. As the application wheel runs on the tractor-wheel surface, one meter driven forward in the field will be directly transferred to the application wheel's circumference, which will also rotate the equivalent of one meter's driven forward. The tractor wheel can be replaced without this affecting the application accuracy.

> SETTING THE APPLICATION WHEEL

The application wheel can be adjusted forward and backwards as well as out and in.

When disengaged, the space between the application wheel and the tractor wheel must be 3–5 cm.

Wherever possible, the application wheel must run in the center of the tractor wheel so it runs on both sets of ridges. If the application wheel bounces on the tractor vehicle wheel, the spreader's application rate will not be correct.



Distance to wheel: 3–5 cm

Pilot-operated check valve

APPLICATION RATE

> APPLICATION PRINCIPLE

Bredal type F spreaders are designed with forced application with adjustable shutters and two narrow belts at the bottom of the hopper for applying the fertilizer.

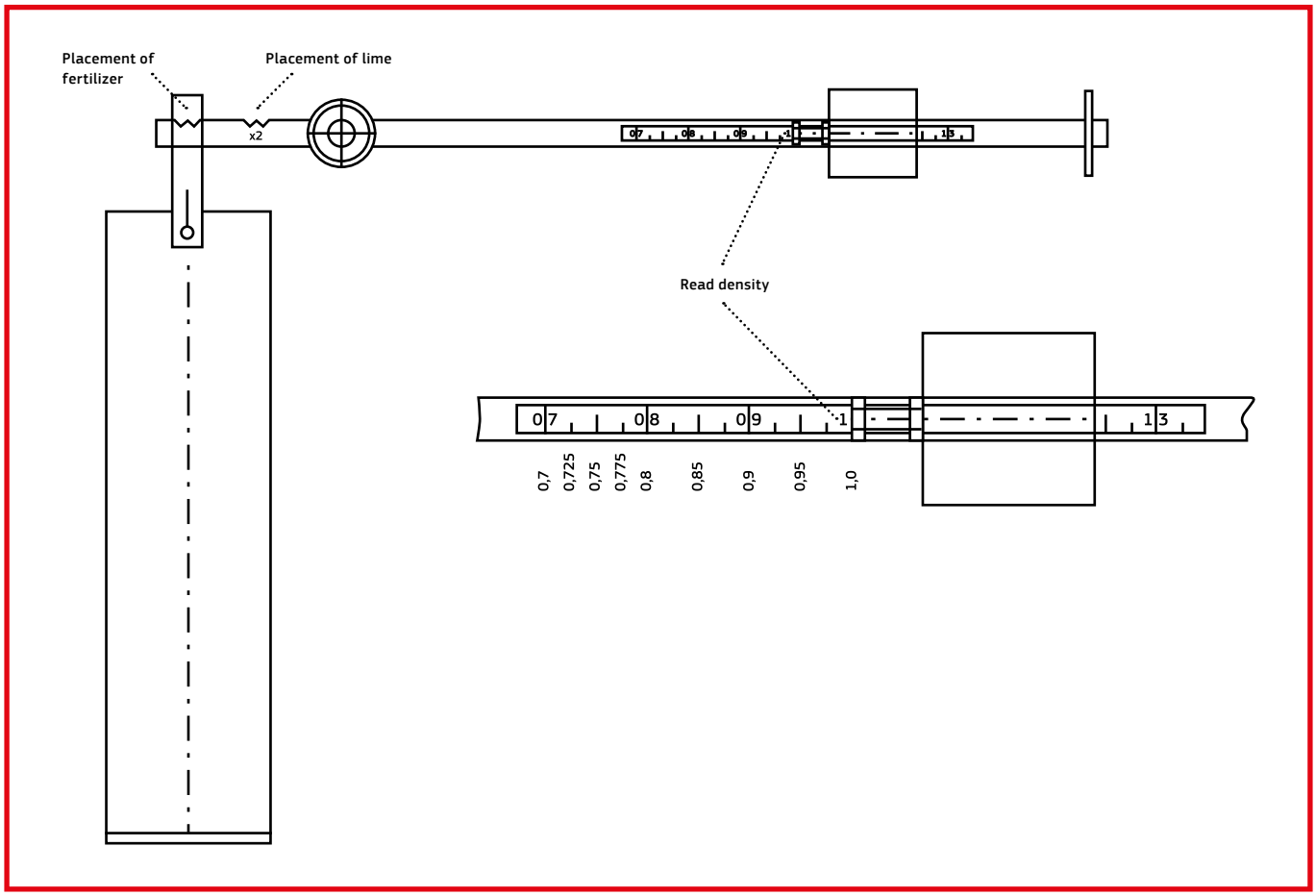
The application rate (belt speed) is driving dependent and driven by an application wheel connected to the tractor wheel, which is why it is possible to freely select the driving speed. Forced application means that in order to determine the correct volume setting, the only factor that needs to be adjusted is the fertilizer's bulk density.

> CALIBRATION KIT

Use the calibration kit to determine the bulk density of the material.
Fill the bucket with fertilizer from the consignment loaded on the spreader. Knock it gently against the floor a few times and fill up. Smooth off the top. Then hang the bucket on the scale in the notch (x1). Set the counterweight so the bracket balances. Read the fertilizer's density on the scale next to the end of the bolt.

The two notches are used when determining the density of very heavy materials (more than 1.3 kg/liter). Fill the bucket, hang it on the two notches, make the setting and read the counterweight. Multiply the determined value by two.

If the scale needs adjustment or verification, do this by filling the bucket with water. When the weighing bracket is in balance, the bolt end must be at 1.0 kg per liter. If this is not the case, adjust the bolt until the setting is correct.



HOW TO USE THE APPLICATION CHART

> APPLICATION PRINCIPLE

To use the application chart, you must know the preferred volume in terms of **kg/ha** as well as the fertilizer's bulk density in terms of **kg/liter.**

After this, find the setting based on the instructions below.

To determine the setting, first convert the volume from kg/ha to liter/ha by dividing kg/ha by the fertilizer's bulk density (calibration kit).

Example:

400 kg of fertilizer per hectare must be spread. The bulk density is 1.10 kg/liter.

$$\frac{400 \text{ kg/ha}}{1.10 \text{ kg/liter}} = 360 \text{ liter/ha}$$

Refer to the application chart under the working width to be run. If you want to spread 360 liter/ha on a 12-meter working width, find '360 liters' or the number closest to this on the chart. Now read which gear to select and the rear-door setting (gear 2 and scale approx. 3.3). **Avoid selecting from the shaded area.**

As a general rule, select the highest gear (high belt speed) and thus the smallest shutter opening possible. This is particularly relevant when spreading in hilly terrain and when spreading smooth-flowing, finely grained fertilizer.

APPLICATION CHART (FOR MECHANICAL LANDWHEEL DRIVE)

12 METERS			
SCALE	GEAR 1	GEAR 2	GEAR 3
-2	93	174	301
-1	111	209	367
0	129	244	433
1	147	279	499
2	165	314	565
3	183	349	631
4	201	384	698
5	219	419	764
6	237	454	830
7	254	489	896
8	272	523	962
9	290	558	1028
10	308	593	1094
11	326	628	1160
12	344	663	1227
13	362	698	1293
14	380	733	1359
15	398	768	1425
16	416	803	1491

15 METERS			
SCALE	AXLE 1	AXLE 2	AXLE 3
-2	74	139	241
-1	89	167	294
0	103	195	346
1	118	223	399
2	132	251	452
3	146	279	505
4	161	307	558
5	175	335	611
6	190	363	664
7	203	391	717
8	218	418	770
9	232	446	822
10	246	474	875
11	261	502	928
12	275	530	982
13	290	558	1034
14	304	586	1087
15	318	618	1140
16	333	642	1193

16 METERS			
SCALE	AXLE 1	AXLE 2	AXLE 3
-2	70	131	226
-1	83	157	275
0	97	183	325
1	110	209	374
2	124	236	424
3	137	262	473
4	151	288	524
5	164	314	573
6	178	341	623
7	191	367	672
8	204	392	722
9	218	419	771
10	231	445	821
11	245	471	870
12	258	497	920
13	272	524	970
14	285	550	1019
15	299	576	1069
16	312	602	1118

18 METERS			
SCALE	AXLE 1	AXLE 2	AXLE 3
-2	62	116	201
-1	74	139	245
0	86	163	289
1	98	186	333
2	110	209	376
3	123	233	421
4	134	256	465
5	146	279	509
6	158	303	553
7	169	326	597
8	181	349	641
9	193	372	685
10	205	395	729
11	217	419	773
12	229	442	818
13	241	465	862
14	253	489	839
15	265	512	950
16	277	535	994

= ADVISABLE TO AVOID THIS APPLICATION RANGE

20 METERS			
SCALE	AXLE 1	AXLE 2	AXLE 3
-2	56	104	181
-1	67	125	220
0	77	146	260
1	88	167	299
2	99	188	339
3	110	209	379
4	121	230	419
5	131	251	458
6	142	272	498
7	152	293	538
8	163	314	577
9	174	335	617
10	185	356	656
11	196	377	696
12	206	398	736
13	217	419	776
14	228	440	815
15	239	461	855
16	250	482	895

24 METERS			
SCALE	AXLE 1	AXLE 2	AXLE 3
-2	47	87	151
-1	56	105	184
0	65	122	217
1	74	140	250
2	83	157	283
3	92	175	316
4	101	192	349
5	110	210	382
6	119	227	415
7	127	245	448
8	136	262	481
9	145	279	514
10	154	297	547
11	163	314	580
12	172	332	614
13	181	349	647
14	190	366	680
15	100	384	713
16	208	402	746

28 METERS			
SCALE	AXLE 1	AXLE 2	AXLE 3
-2	40	75	129
-1	48	90	157
0	55	105	186
1	63	120	214
2	71	135	242
3	78	150	270
4	86	165	465
5	94	180	327
6	102	195	356
7	109	210	384
8	117	224	412
9	124	239	441
10	132	254	469
11	140	269	497
12	147	284	526
13	155	299	554
14	163	214	815
15	170	329	611
16	178	344	639

30 METERS			
SCALE	AXLE 1	AXLE 2	AXLE 3
-2	37	70	120
-1	44	84	147
0	52	98	173
1	59	112	200
2	66	126	226
3	73	140	252
4	80	154	279
5	88	168	306
6	95	182	332
7	102	196	358
8	109	209	385
9	116	223	411
10	123	237	438
11	130	251	464
12	138	265	491
13	145	279	517
14	152	293	544
15	159	307	570
16	166	321	596

= ADVISABLE TO AVOID THIS APPLICATION RANGE

32 METERS			
SCALE	AXLE 1	AXLE 2	AXLE 3
-2	35	65	113
-1	42	78	138
0	48	92	162
1	55	105	187
2	62	118	212
3	69	131	237
4	75	144	262
5	82	157	287
6	89	170	311
7	95	183	336
8	102	196	361
9	103	203	386
10	116	222	410
11	122	236	435
12	129	249	460
13	136	262	485
14	143	275	510
15	149	288	534
16	156	301	559

36 METERS			
SCALE	AXLE 1	AXLE 2	AXLE 3
-2	31	58	100
-1	37	70	122
0	43	81	144
1	49	93	166
2	55	105	188
3	61	116	210
4	67	128	233
5	73	140	255
6	79	151	277
7	85	163	299
8	91	174	320
9	97	186	343
10	103	198	365
11	109	209	387
12	115	221	409
13	121	233	431
14	127	244	453
15	133	256	475
16	139	268	497

= ADVISABLE TO AVOID THIS APPLICATION RANGE

TURNING TEST TO VERIFY THE APPLICATION RATE

If you wish to verify the application, it is possible to perform a turning test:

1. Set the machine at the preferred application rate.

2. Dismantle the spreading discs.

3. Turn the application wheel until the belts are completely filled.

4. Place a tray or bucket under each downchute.It is necessary to insert a piece of cardboard or similar under each downchute to guide the fertilizer into the bucket.

5. Turn the application wheel 11.5 revolutions at high speed (approx. 1 revolution per second).

6. Weigh the volume collected from both belts.

7. Multiply the weight by the factor equivalent to the working width selected according to the chart below. This indicates the number of kg/ha being applied.

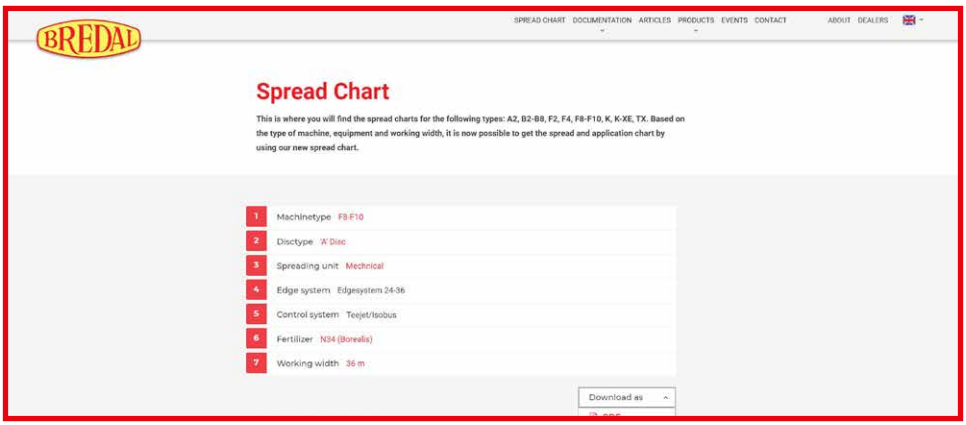
   Example: 24m, 14 kg collected, multiplied times factor 20 = 280 kg/ha

WORKING WIDTH, METER/FACTOR

Working width	meterFACTOR
12	40
15	32
16	30
18	26.7
20	24
21	22.9
24	20
28	17.1
30	16
32	15
36	13.3

> SETTINGS FOR VARIOUS TYPES OF FERTILIZER

Settings for various fertilizer types can be downloaded from Bredal's website. The settings are determined by testing the various fertilizers in practice. Update the settings on an ongoing basis to make sure they are up to date. It is advisable to use these settings. In additional, it is advisable to perform a field spreading test to make sure you get a satisfactory spreading result (see the section 'Spreading test and adjustment'). Go to Bredal's website www.bredal.com



At the website, select "Spread Chart" in the menu at the top of the screen.

Under "Machine type", select "F2"

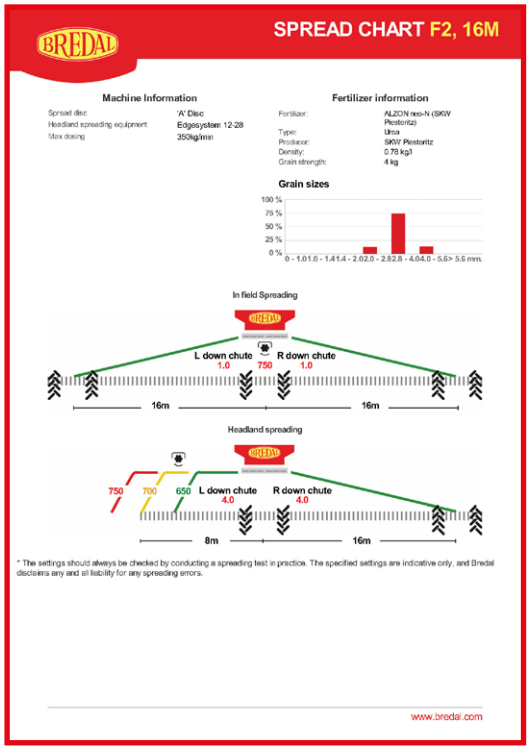
Select headland/border system

Select control (in this instance select mechanical, if the spreader is from 2018 onwards).

Select the type of fertilizer to be spread

Select the working width to be used

Press "Download as PDF"



This will take you to the results page with the settings that fit the type of fertilizer selected.
Set the recommended downchute settings for field and headland spreading on the spreader.
Also, the spreader should be set to run at the PTO's recommended rpm.

The fertilizer, name, manufacturer, density, crushing strength and granule distribution selected appear in the spread chart at the top of the results page.

The recommended downchute settings and the PTO's rpm for field spreading are shown in the center of the chart.

The recommended downchute settings and the PTO's rpm for headland spreading are shown at the bottom of the chart (scroll down).

Red = complete spreading to boundary

Yellow = medium spreading along boundary

Green = very little fertilizer beyond boundary

> RECOMMENDED UNIVERSAL SETTINGS

If you are unable to find the fertilizer to be used or similar on the website, as an alternative, you can use the **recommended universal settings** for ordinary NPK, NS, PK and N fertilizers. Spread charts with universal settings for field spreading and headland spreading are found on the following pages.

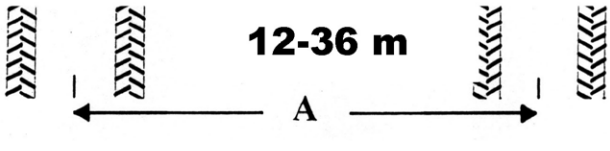
For spreading special fertilizers such as potash, granular urea, ammonium sulfate and N34, the downchute setting must typically be 1–3 scale steps higher than the recommended universal setting.

For working widths greater than 24 meters, always perform a field spreading test to make sure you get a satisfactory spreading result (see the section 'Spreading test and adjustment').

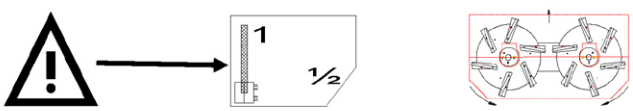
RECOMMENDED UNIVERSAL SETTING FOR A DISCS, FIELD SPREADING, 12–36 METERS

HANDLE FOR HEADLAND GEAR

Always set the engage/disengage handle for the headland gear in the top position 'field spreading'.



A	2X [1]	
12 m	0	450
15 m	1	540
16 m	1	540
18 m	2	600
20 m	2,5	700
24 m	4	900*
28 m	4	1000*
30 m	4,5	1000*
32 m	5	1000*
36 m	5,5	1000*



Note that the gear selector for headland spreading **must** be set at **field spreading** (top position).

2X[1] = the setting applies to both downchutes

HEADLAND SPREADING

The headland spreading system works by reducing the speed of the spread disc on the side facing the boundary. At the same time, change the downchute positions to optimize the headland spreading.
Wherever possible, use the rpm and downchute settings shown on the spread charts on Bredal's website, www.bredal.com.

If you are unable to find the fertilizer to be used or similar on the website, as an alternative, you can use the recommended universal settings for ordinary NPK, NS, PK and N fertilizers shown below.

The headland gear is positioned under the left spread disc and reduces the disc's rpm when it is activated.

Drive with the left side facing the boundary.

To adjust the spreader for headland spreading, move the gear selector on the spread unit to the lowest position, "headland spreading".

Adjust the downchute positions at the same time.

The spread discs must NOT rotate when changing between field and headland spreading.

To adjust the spreader for headland spreading, move the gear selector on the spread unit to the lowest position, "headland spreading".

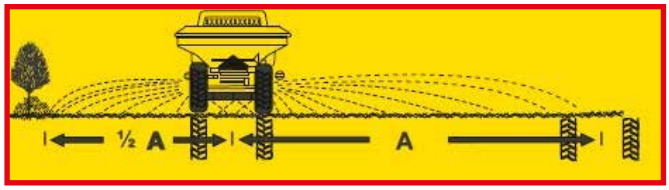
> RECOMMENDED UNIVERSAL SETTING FOR HEADLAND SPREADING

If you are unable to find the fertilizer to be used or similar on the website, as an alternative, you can use the **recommended universal settings** for ordinary NPK, NS, PK and N fertilizers. Spread charts with universal settings for headland spreading are found on the following pages.

For spreading special fertilizers such as potash, granular urea, ammonium sulfate and N34, the downchute setting must typically be 1–3 scale steps higher than the recommended universal setting.

If complete application to boundary is desired, increase the rpm by roughly 100 rpm compared to the chart.
To prevent spreading beyond the boundary, reduce the rpm by roughly 100 rpm compared to the chart.

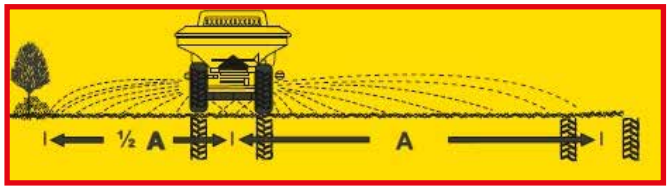
RECOMMENDED UNIVERSAL SETTING FOR HEADLAND SPREADING WITH A 12–28 M HEADLAND GEAR



A	Downchute, left and right		
12 M	4.0	400	
15 M	4.0	450	
16 M	4.0	500	
18 M	5.0	650	
20 M	5.0	750	
24 M	5.5	950	
28 M	6.0	1000	

Note that the gear selector for headland spreading **must** be set at **headland spreading**

RECOMMENDED UNIVERSAL SETTING FOR HEADLAND SPREADING WITH A 24–36M HEADLAND GEAR



A	Downchute, left and right		
24 M	5.0	650	
28 M	6.0	700	
30 M	6.5	750	
32 M	6.5	800	
36 M	7.0	950	

Note that the gear selector for headland spreading **must** be set at **headland spreading**

FERTILIZER QUALITY

Fertilizer quality is crucial for spreading quality. In order to check fertilizer quality and get an idea of the spreading capacity, the following values are the most important to know:

- Particle strength
- Particle size
- Dust content
- Bulk density
- Particle shape

Particle strength can be measured using the crushing strength tester included in the supply. Press the granule with the crushing strength tester until the granule ruptures and then read the crushing strength. Repeat this with several granules, big and small, and then calculate the mean crushing strength.

Particle size can be measured using Bredal's sieve shaker. Fill the space above the biggest-meshed screen, attach the lid and shake until the distribution of granules remains constant. Turn the sieve shaker so the lid is facing up again. Now it is possible to determine the distribution of particle size.
The dust content appears after finding the distribution of particle size, as relative percentage of the fertilizer below the smallest-meshed screen. In many cases the dust content can also be estimated visually.

Bulk density is usually specified by the fertilizer manufacturer; otherwise it can be determined by using a Bredal calibration kit (extra accessory).

Particle shape can be assessed visually. The smoother and rounder the particle, the further it can be flung through the air. A very angular granule or a granule with many surface nodules is less aerodynamic, impeding its ability to cover the entire swath of wide working widths.

> EFFECT OF FERTILIZER QUALITY ON SPREADING PROPERTIES

Low crushing strength means that the fertilizer tends to get crushed, both during transportation and spreading. Low crushing strength is often related to dust content, as fertilizer with a low crushing strength is easily crushed during transportation and reloading. The crushing strength is usually up to par when the fertilizer leaves the factory, but if the fertilizer has been subjected to moisture or water, it loses its original crushing strength and never regains it, even if the fertilizer consignment is dried. Certain types of fertilizer always have a low crushing strength, such as prilled urea. In order to be able to spread a fertilizer over wider working widths (24 meters or more), the crushing strength should at least be 3–4 kg. If it is below this, the discs' revolutions need to be reduced to avoid crushing the fertilizer, thereby narrowing the working width, eliminating the option of wide working widths.

The particle size affects how far the fertilizer can be flung. Large fertilizer granules can be flung further than small ones, which means that a certain particle size is required to cover the entire swath of wide working widths. The average particle size should be more than 3 mm to make it possible to spread up to 36 meters. In other words, more than 50% of the particles should be in the section above the 3 mm sieve in Bredal's sieve shaker.

The dust content increases with the number of treatments (reloading, transportation, etc.) to which the fertilizer is subjected. If much of the fertilizer has been crushed into dust, this will be deposited as a layer behind the spreader, usually 4–5 meters wide across the tracks, and it will usually make it difficult to obtain satisfying spreading results.
Heavy fertilizer particles can be flung further than light ones, which is why fertilizer density is crucial for the working width. Most types of fertilizer have a density of around 1.0 kg/liter or slightly more. A few have a lower density (0.7–0.75 kg/liter), but it is difficult for these types to fully cover 36-meter working widths.

Rectangular or irregular fertilizer has poor aerodynamic characteristics, which is why it cannot be flung as far. Wide working widths require aerodynamic fertilizer granules. These characteristics are difficult to measure in practice, but a visual assessment is sufficient and not difficult to make, as round and especially smooth granules can be thrown the furthest.

It is advisable not to spread more than 350 kg/minute

The spreader can spread large volumes but the spreading pattern of certain types of fertilizer will be impaired at higher application rates.

If a larger volume needs to be spread, a spreading test should always be done in the field for the given

volume to ensure satisfactory spreading results.

Calculate the actual application rate per minute using the following formula:

$$\frac{\textbf{Km/h x working width x kg/ha}}{\textbf{600}} = \textbf{kg/min.}$$

Example $\frac{12 \text{ km/h} \times 24 \text{ m} \times 300/\text{ha}}{600} = 144 \text{ kg/min.}$

It is also possible to calculate the maximum driving speed for a specific application rate and working width as follows:

$$\frac{\textbf{600 x max. kg/min.}}{\textbf{width x kg/ha}} = \textbf{km/h (max.)}$$

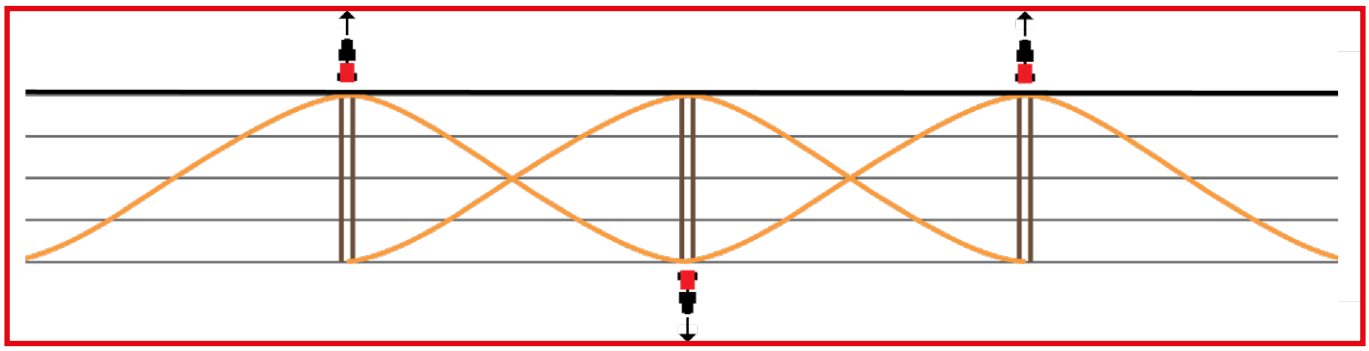
Example $\frac{600 \times 350 \text{ kg/min.}}{36 \text{ m} \times 400 \text{ kg/ha}} = 14.6 \text{ km/h (max.)}$

FERTILIZER SPREADING TEST AND SPREADING ADJUSTMENT

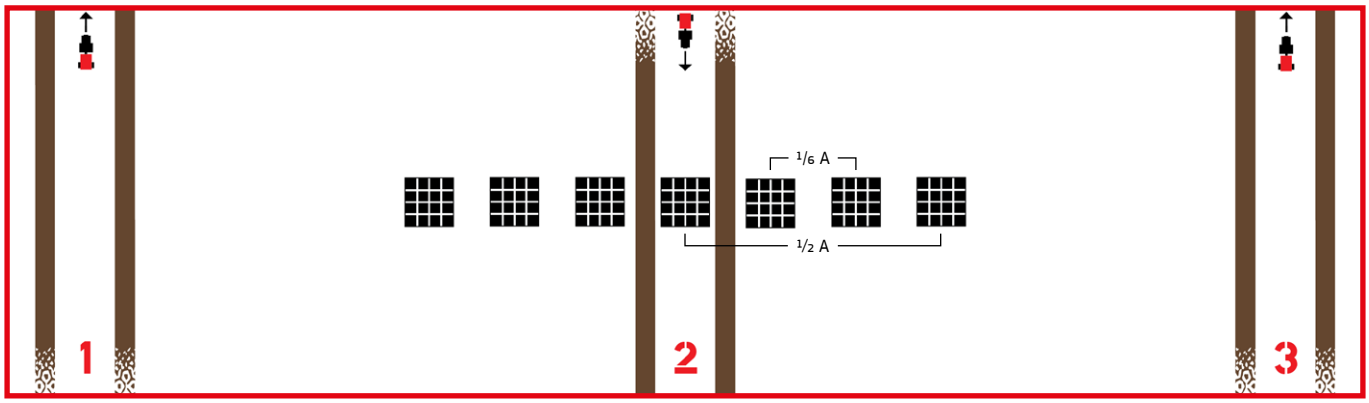
A spreading test should always be done in the field to ensure satisfactory spreading patterns. Consider the following factors when conducting a fertilizer spreading test:

- Perform the test in dry conditions (field/implement).
- Perform the test in a field covered with a healthy crop: approx. 10 cm of thick plant growth, to avoid ricocheting granules.
- Conduct the test on a flat section of the field and, when setting out trays, make sure that all of them are level wherever possible.
- Conduct the test at the forward speed normally used for spreading (ideal: 14–15 km/h, if the field allows).
- Let 100–200 kg of fertilizer run through the spreader before conducting the test. There may be deposits of old fertilizer, verdigris or rust on the spreading discs and vanes. These deposits must be worn off before the spreader can produce a constant spreading pattern.
- Set up the trays at one-half of the working width on both sides of the centermost of the three wheel tracks. **Distance between the trays = 1/6 of the working width**
  Example: 30-meter working width = 5 meters between the trays. Drive forward in the first, back in the second and forward again in the third track. To get sufficient volumes in the trays so that they can be used for an assessment, it is necessary to spread at least 200 kg/ha.
- Make sure to drive far ahead of the trays before disengaging the application, as the spreader flings the fertilizer far to the rear.

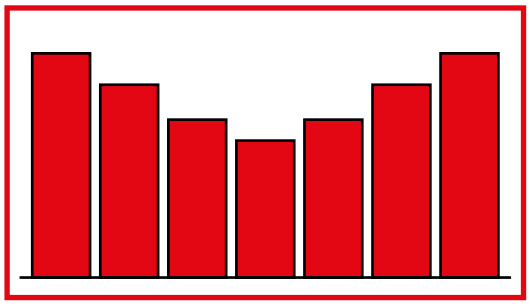
.



Ideal distribution of fertilizer using overlapping.

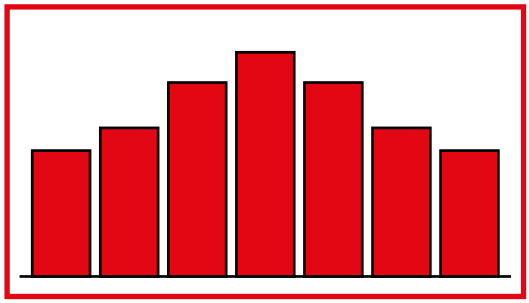


Setting up testing trays in the field.
After pouring the fertilizer into the measuring cups, assess the spreading results. A correction of the spreading picture is shown on the next page.



IF EXCESS FERTILIZER IS DEPOSITED BETWEEN THE WHEEL TRACKS

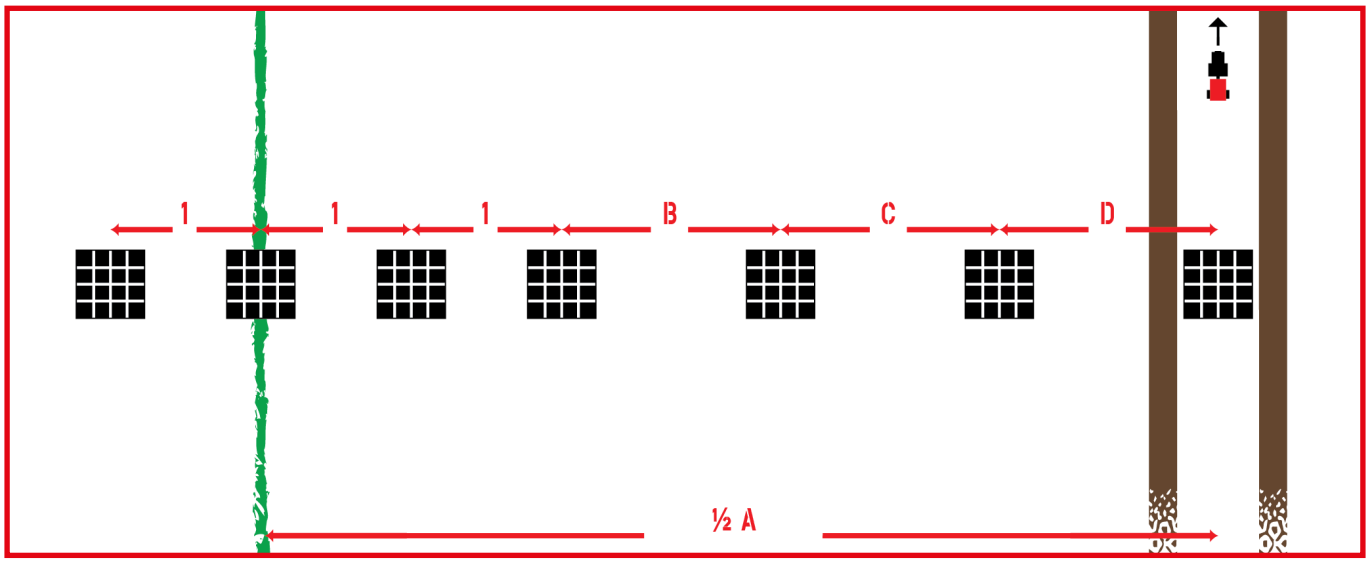
- Set the downchute position to a lower value. Preferably set it 2 steps lower. If a subsequent test shows that two steps was too much, the difference between the two tests will indicate how much the scale needs to be moved back.



IF EXCESS FERTILIZER IS DEPOSITED BEHIND THE SPREADER

- Set the downchute position to a higher value. Preferably set it 2 steps higher. If a subsequent test shows that two steps was too much, the difference between the two tests will indicate how much the scale needs to be moved back.
- If lots of fertilizer dust accumulates right behind the spreader, this could be caused by fertilizer being crushed at an excessively high disc speed or if the crushing strength of the fertilizer is too low.
  Try reducing the rpm by 100–200 rpm

> SPREADING SAMPLE: HEADLAND SPREADING



Position the trays as shown below. If the spreader deposits too much fertilizer beyond the boundary in relation to the preferred amount, lower the rpm by 50–100 rpm per test until the spreading result is acceptable. Conversely, the rpm setting should be increased by 50–100 rpm if spreading to the boundary is insufficient.

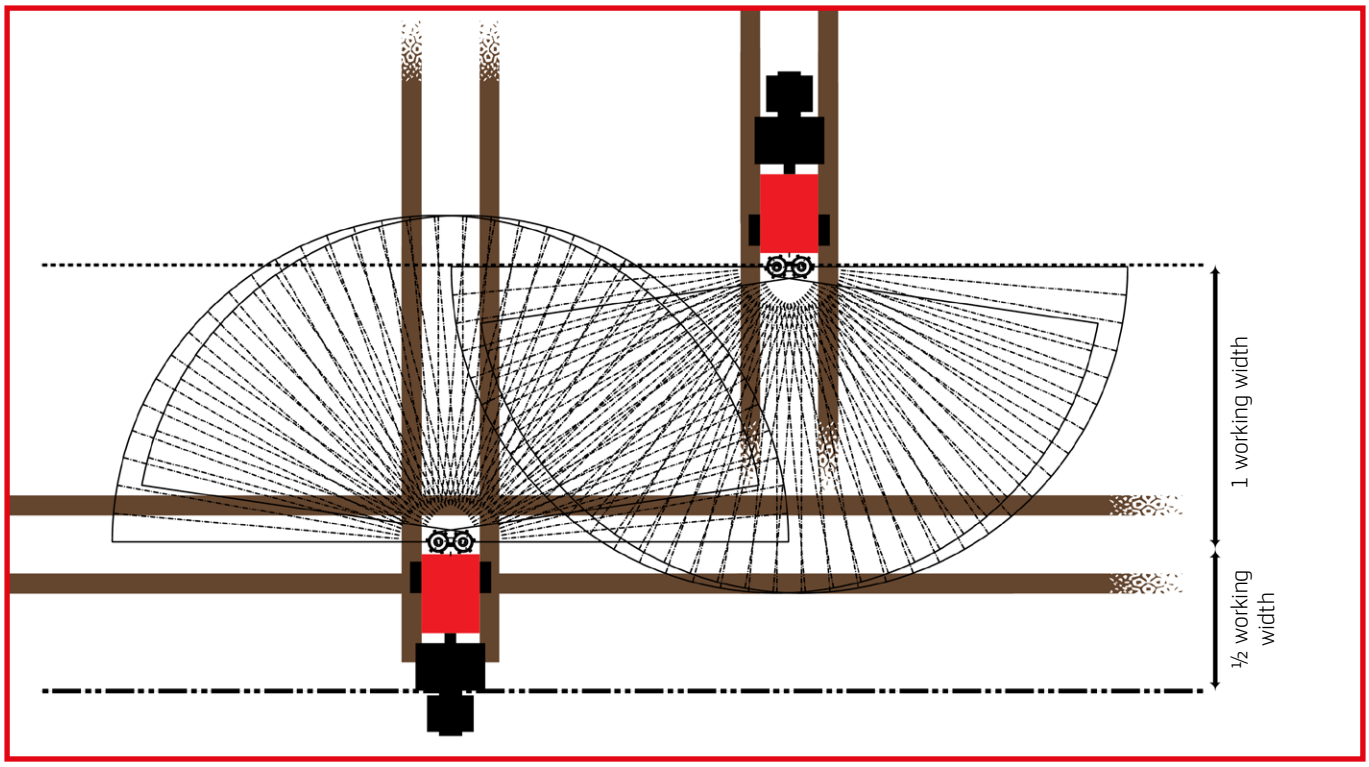
ENGAGING/DISENGAGING IN HEADLAND

Engage and disengage the spreading in the headland at the right time.

General rule:

When the discs pass the headland's tracks, disengage them (for working widths above 24 meters, slightly before this, however).

Re-engage when the discs are one working width from the headland's tracks.



LATE APPLICATION

Late application of fertilizer can be done in one of two ways:

> WITH THE SPREADER IN A RAISED POSITION

The best spreading result is achieved by raising the spreader high enough so the spreading discs are at the recommended height (85–90 cm) over the crop. It is possible to achieve an acceptable result as low as 50 cm over the crop, however, but this increases the risk of damaging the plants and makes them more easily affected by an incorrect spreader angle.
Use the standard late-application settings when using this method.

> WITH LATE APPLICATION EQUIPMENT

Late application equipment can be used to spread in tall crops when parts of the crops are at a height up to the top edge of the spread discs. (Late application equipment is an optional feature.)

Bolt the late application equipment to the brackets holding the safety bars on both sides, and in the middle it will rest on the center bracket.

It is crucial to mount this equipment in a level position on the spreader, as otherwise the spreading will be laterally distorted.

Note that the late application equipment lifts the fertilizer, which means that the spreading will be more sensitive to wind than usual, so do not use this equipment in windy conditions.

The PTO setting must be slightly lower and the downchute setting should be slightly lower than normal when late application equipment is attached. The table below shows how much needs to be subtracted compared to the settings for normal operation.

For headland spreading, activate the headland gear/headland spreading as usual, but using the settings specified below.

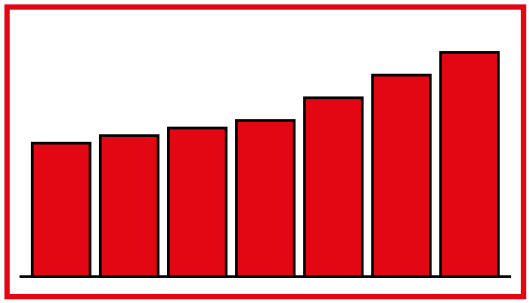
	Field spreading		Headland spreading	
Working width	**rpm**	**Downchute**	**rpm**	**Downchute**
12	-100	0	-50	0
15	-100	-1.0	-50	-1.0
16	-100	-1.0	-50	-1.0
18	-100	-1.0	-50	-1.0
20	-100	-1.0	-50	-1.0
24	-200	-2.0	-150	-2.0
28	-200	-1.0	-100	-1.0
30	-150	-0.5	-100	-0.5
32	-150	0	-50	0
36	-150	0	-50	0

Example:
A 30-meter working width will be used. According to the settings on Bredal's website, the PTO rpm should be set at 1000 rpm and the downchute position at 5.0.

According to the table under 30 meters, subtract 150 rpm from 1000 rpm, so that the spreader operates at 850 rpm.
Normally the downchute position is 5.0, but according to the table, 0.5 should be subtracted from so the downchute position is 4.5.

> LATERALLY DISTORTED SPREADING

If the spreading is laterally distorted, in other words if more fertilizer is spread on the right than on the left, and vice versa.



- Make sure the spreading vanes are correctly mounted on spreading disc.
- Make sure that the spreader is horizontally positioned with no lateral inclination behind the tractor, and that the stabilizer chain assemblies are tensioned so that the spreader is centered behind the tractor during spreading.
- Make sure that both shutters are open to the same extent.
- Make sure that the right and left downchutes are set at the same value.

> INCORRECT APPLICATION RATE

If the spreader does not apply correctly, follow the prioritization below.

- Make sure that the fertilizer's bulk density is correct. Use the calibration kit for this purpose.
- Double check that the conversion from kg/ha to liter/ha was done correctly.
- Make sure that the application wheel runs correctly on the tractor wheel.
  (See the section "Setting the application wheel").
- Make sure the rear door is set correctly (see the section "Checking the rear doors and their basic setting').
- If the spreader's application rate continues to be incorrect after performing the above steps, calculate the number of steps on the application rate scale that are causing the incorrect application.
  In this case, it is possible to use the adjustment screws on the shutters' connecting link to adjust the error. One step on the scale equates to 2.5 mm on the shutter, i.e. each one-and-a-half turn of the connecting link's screws will raise/lower the shutter by 1 scale step.
- It is possible to perform a turning test to verify the application rate (see the section "Turning test to verify the application rate").

FLOOR BELT ADJUSTMENT

Normally, the belts do not need to be tightened, unless they are sliding on the rollers and cannot keep up. In many cases, this may be necessary after the first few days of operation, as the belts stretch a little when new.
If a floor belt needs to be tightened, tighten the bolts on both sides of the belt one-half of a revolution at a time until the belt moves with the rollers.

The belts must run on the center of the rollers.

If the belt runs out to one side, tighten the nut on the side to which the belt is running out. Tighten the nut about one-quarter of a turn at a time.

CHECKING THE REAR DOORS AND THEIR BASIC SETTING

The basic setting of the rear doors must be correct in order for the spreader to apply correctly.

It is possible to check the setting by setting the scale at 8 and placing a 40 mm square pipe underneath the door. If the settings are incorrect, adjust the doors on their tension rod. Also, it is a good idea to check the spacing between the floor belts.

Set the rear doors' scale at 8

Place a 40 mm square pipe under the door. The square pipe should be able to move freely under the door with almost no clearance. Adjust the door's tension rod if this setting is not correct.

The spacing between the floor belts must be 110–115 mm in the rear door opening. Make sure that the belt and edge molding do not bulge outwards/upwards, as this will change the area of the door opening and thus the application rate. This can occur if they have been exposed to oil, in which case they should be replaced.

LUBRICATION POINTS

The different lubrication points on the implement are shown below. The number of operating hours for each lubricating interval is specified at each lubricating point.

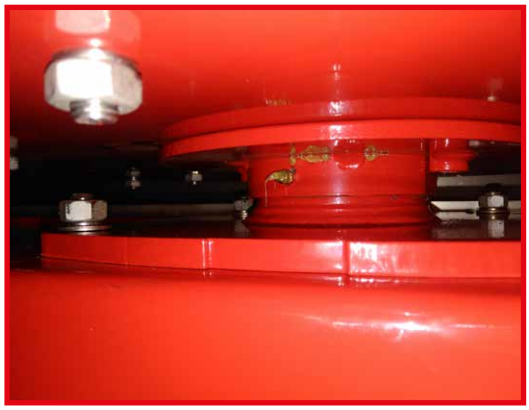
> EVERY 50 HOURS

PTO shaft. Disassemble the PTO shaft and lubricate the 6-spline ends with grease.

Input shaft on the spread unit.

> EVERY 100 HOURS

Floor belt guide rollers (2 for each belt)



Right and left top, just below the discs.

PTO shaft for landwheel drive (one grease nipple at each end)

Lever arm for landwheel drive (3 grease nipples)

Flange bearing for rear roller

> EVERY 200 HOURS

Tightening device on the spread unit.

Protective end pieces for rear roller

MAINTENANCE AND LUBRICATION OF SPREAD UNIT (SPC4500-1)

It is important to keep the spread unit properly maintained/lubricated. There is a general time interval for how often the spread unit should be lubricated. Otherwise, it is important to lubricate the headland gear, etc., especially after washing the spreader and before putting the spreader into storage for winter. Also, it is important to test the headland gear's function when the spreader is attached to the tractor and after a long idle period. Check the tightness of the V-belts at regular intervals. The procedures for inspecting and maintaining the spread unit are shown below.

> V-BELT TIGHTNESS

A spring to tension the V-belts is attached to the right side of the spread unit. Tension the spring to 93–95 mm when the spread unit is cold. Check the tightness after every 20 hours of operation. Re-tighten if the spring measures more than 95 mm.

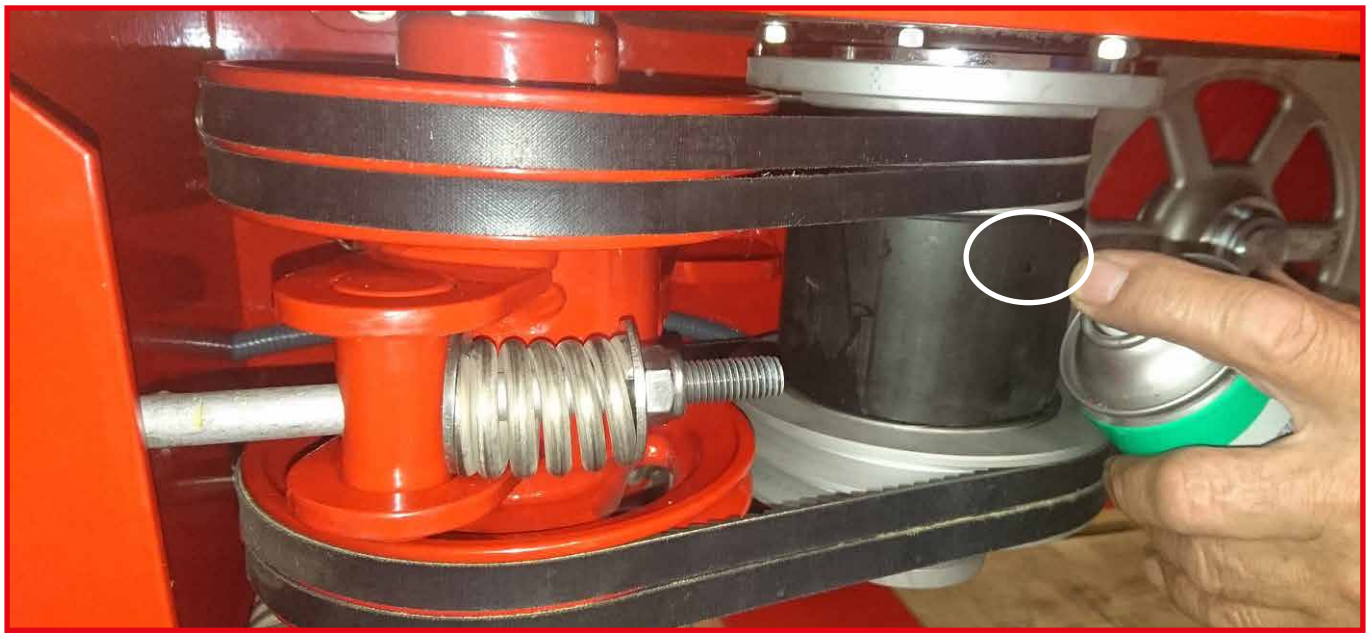
> HEADLAND GEAR FUNCTION

Check the headland gear by rotating the left disc after switching between field and headland spreading. If the headland gear is activated, the left disc must rotate more slowly than the right disc. If field spreading is active, the discs must rotate at the same speed. After switching, a distinct "clunk" sound will be heard when rotating the disc to indicate that the claw clutch is engaged.

> LUBRICATION AND ADJUSTMENT OF HEADLAND GEAR

The headland gear's claw clutch is protected by a plastic tube perforated by a 3 mm hole. Lubricate the clutch before the season begins and after every 100 operating hours by spraying a thin oil or rustproofing oil through the hole.Always lubricate if the inside of the spread unit has been washed and before putting the spreader into storage for the winter.

The spring that keeps the headland gear's V-belt tight must be tightened to a length of 43–45 mm when the spread unit is cold. Check the tightness after the first 20 hours of operation and then after every 100 hours of operation. Re-tighten if the spring measures more than 45 mm.



GEARS

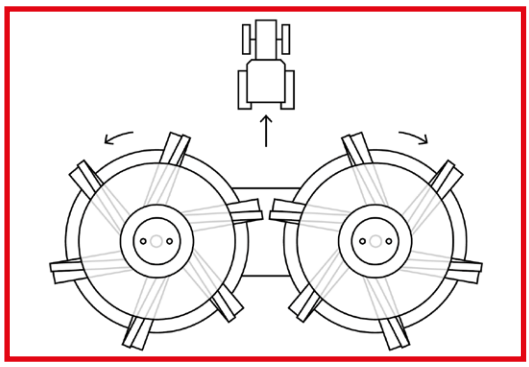
For ordinary operation, it is not necessary to replenish or replace the oil in the closed three-gear chain drive.

Check the oil level if there are signs of leakage, however.

Keep the oil at a level so that the chain just reaches the oil and no more. Content: approx. 1.0 liters

The spreader is filled with Castrol SP 150 gear oil ex works, but a similar gear oil of a similar make can also be used.

> SPREADING SYSTEM



Check that the spreading system is clean and in working order every day. Insufficient cleaning or worn-out spreading vanes can result in poor spreading patterns.

Certain types of fertilizer and humid weather can create coatings on downchutes and spreading vanes, so these should be inspected and cleaned regularly during operation.

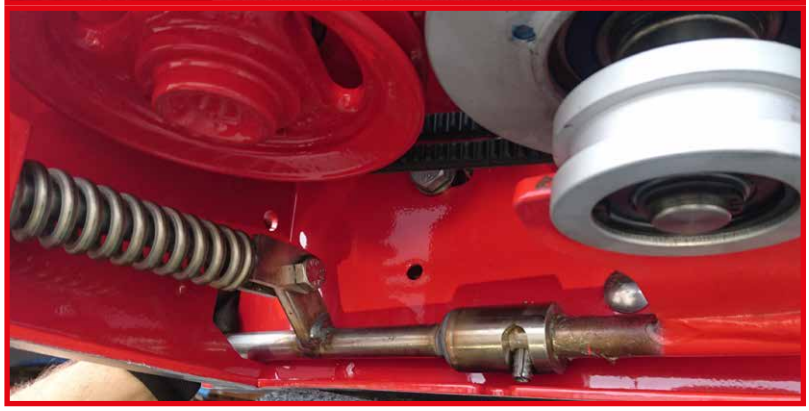
Replace the spreading vanes if holes are worn into them. **It is very important that the spreading vanes are correctly mounted on the spreading discs, as shown in the drawing.**

> WASHING AND STORAGE

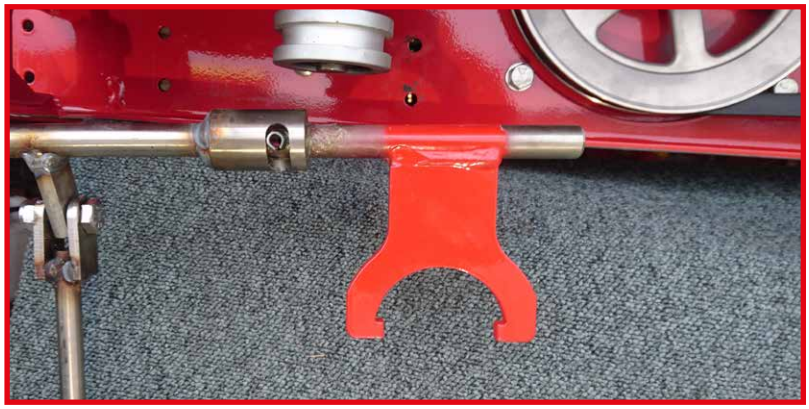
Always be careful when washing with a high-pressure washer and never spray directly on bearings, sensors, etc.

Before winter storage, clean the spreader carefully and apply a layer of rust-protective oil to the implement. **Be careful not to apply oil on the rubber belt as this will dissolve the rubber.** It is advisable to first spread a layer of cat litter or sawdust on the belt to absorb excess oil. Remember to remove the material after four or five days once all the oil has been absorbed.

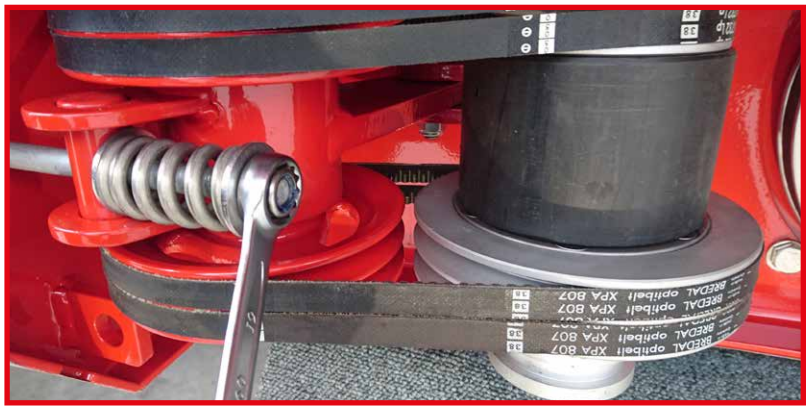
REPLACING V-BELTS ON SPC4500-1



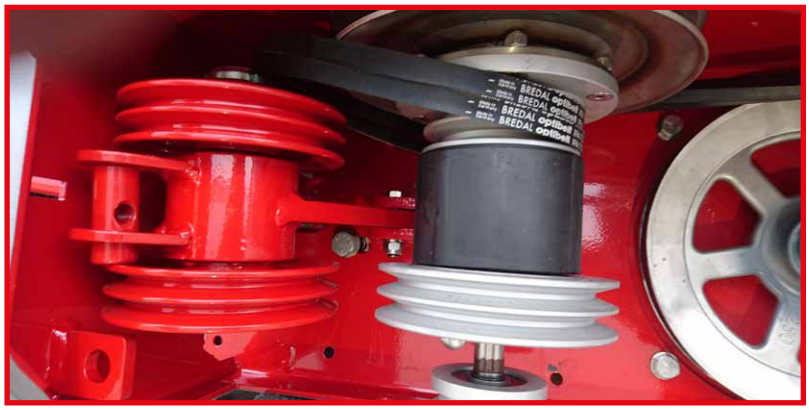
Completely disassemble the three plastic bearings for the headland gear's shifter shaft.
If the headland gear is hydraulically shifted, screw off the hydraulic cylinder from the shifter shaft.



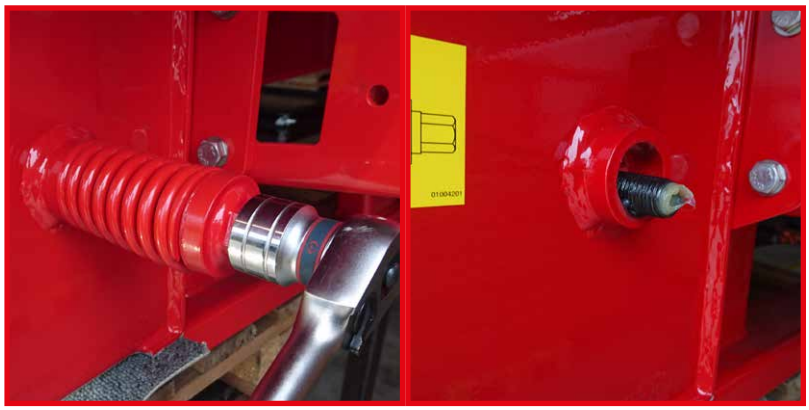
The shifter shaft with shifter fork is now clear and can be removed.



Completely unscrew the headland gear's belt tightener with spring.



Disassemble the bottom two and then the upper two V-belts on the headland gear.

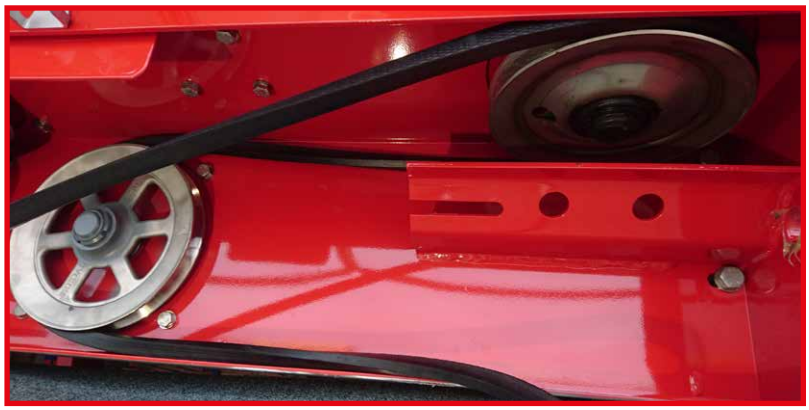


Disassemble the spring for the belt tightener.

Take off the belt tightener and remove the belt.

The spread unit is now ready to be fitted with a new belt.

First wind the belt around pulley 1.



Twist the top of the belt on pulley 1 and lead it behind pulley 2.

Twist the belt half a turn.

Wind the belt around the pulley on the headland gear.

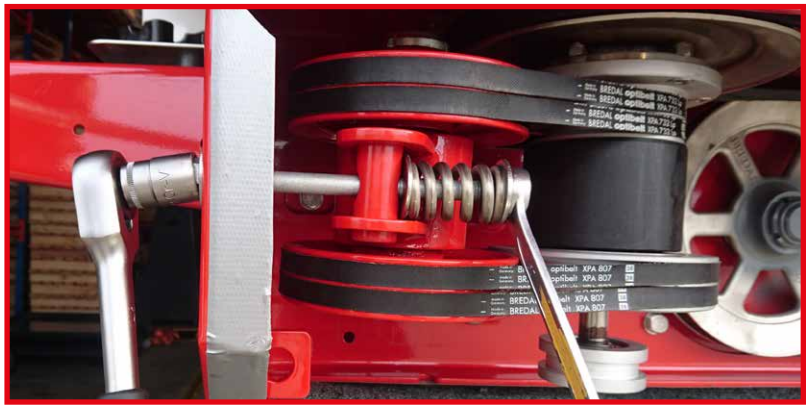
Insert the belt tighteners into the loose ends of the belt. Then attach the spring to the belt tightener.

Tighten the spring until it has a length of 91–93 mm.

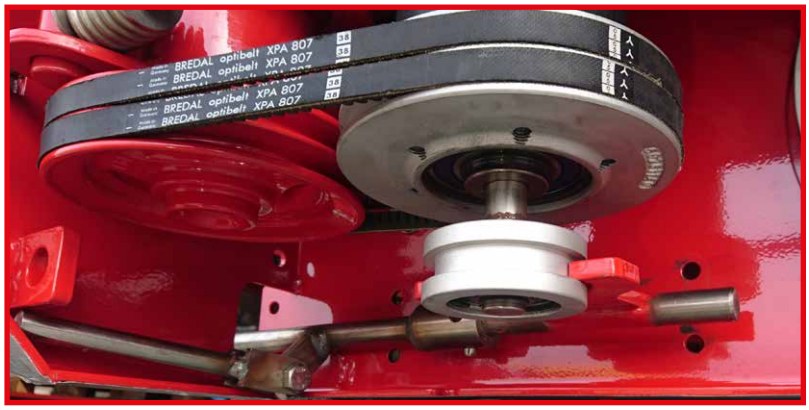
Attach the upper two V-belts to the headland gear.

Attach the bottom two V-belts to the headland gear.

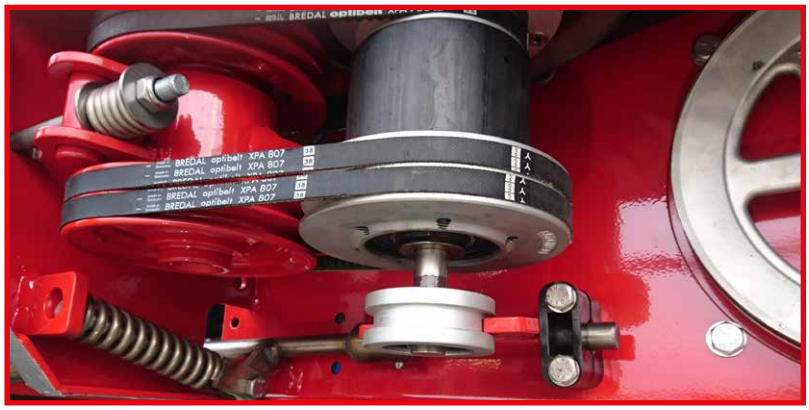
Use a screw clamp to tighten the belts for the headland gear.



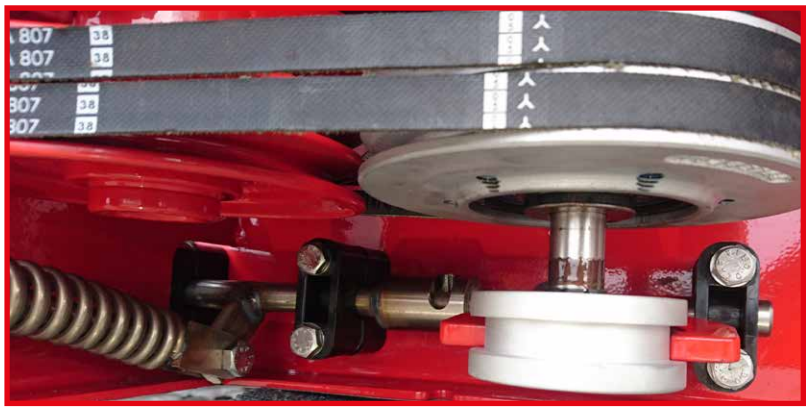
Attach the bolt with a spring for the belt tightener and tighten until the spring length is 43–45 mm.



Attach the shifter shaft with shifter fork.



Attach the spring to the spring guide and insert the guide into the hole.
Loosely mount the plastic bearing furthest to the right.



Mount the last two plastic bearings. If necessary, use a crowbar or similar to move the shifter shaft into place. Tighten all plastic bearings. Make sure the shaft can still freely rotate when tightening, i.e. do not overtighten.

If relevant, complete the process by attaching the hydraulic cylinder for shifting the headland gear.


MANUAL
F2
EN

For more than 50 years, BREDAL has specialized in the development and production of high-quality lime and fertilizer spreaders for agricultural purposes. The company's goal is to build reliable machinery, precise in use, and simple to operate and maintain. In recent years, the product line has also included winter equipment such as sand and salt spreaders.

The company's interests in countries importing BREDAL machinery are represented by local importers who sell BREDAL spreaders and provide technical support and service.

BREDAL is located in Vejle, Denmark, where it has state-of-the-art production facilities with the latest technologies ensuring the production of top-quality machines.

SIMPLE
PRECISE
RELIABLE

30100336S Manual F2 EN 12/2020

Bredal A/S · Nimvej 1 · 7120 Vejle · Denmark · Tel.: (+45) 7589 5177 · info@bredal.com · www.bredal.com