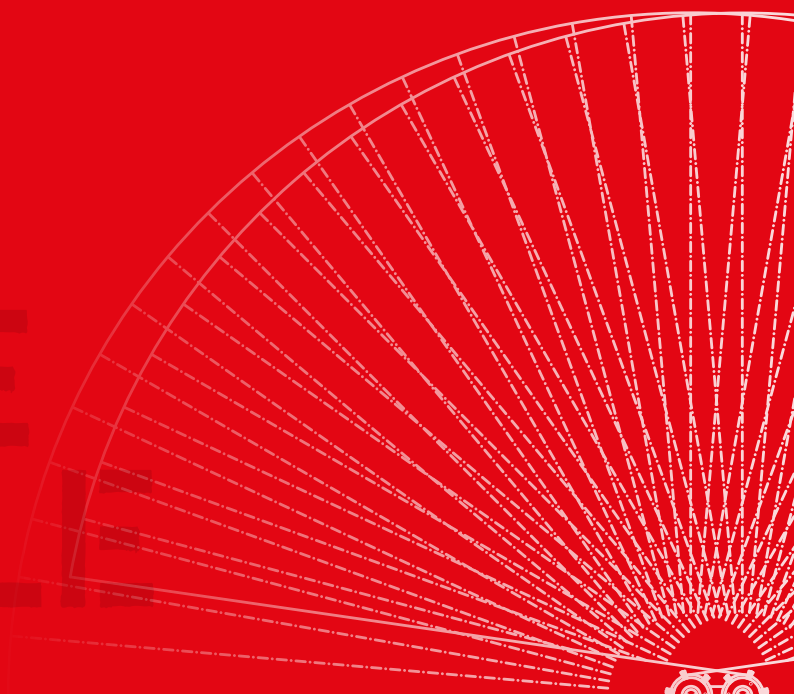




SIMPLE
PRECISE
RELIABLE







CONTENTS

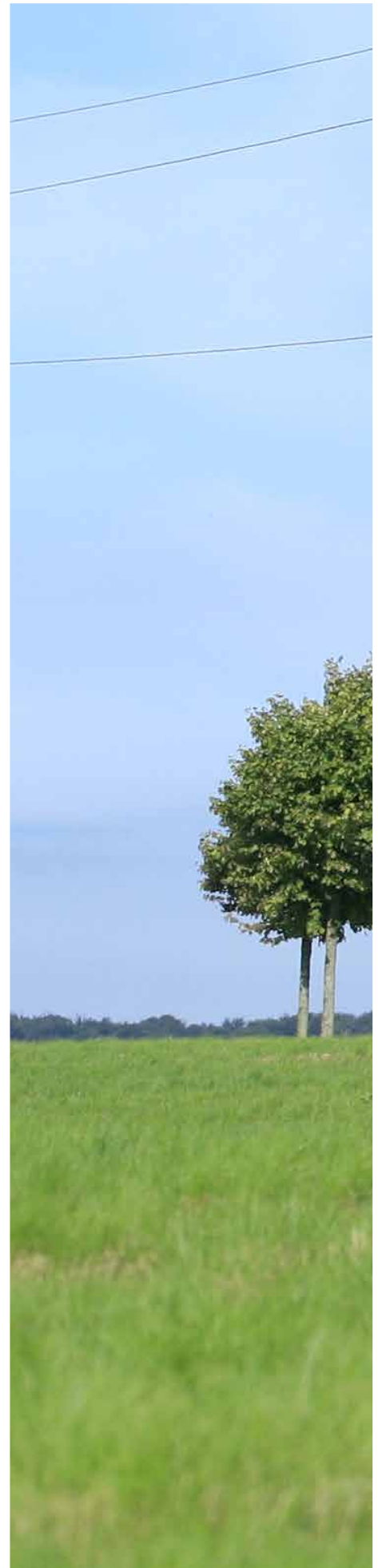
F4.....	2
Construction.....	4
Bredal F4.....	9
Spreading of fertilizer	12
Headland spreading.....	13
Spreading tests.....	14
Standard equipment.....	16
Additional equipment.....	22
Spreading principle.....	26
Computer control/ISOBUS.....	28
F4 technical specifications	30
Equipment overview	32
Dimensional sketches.....	33

F4 IS A MOUNTED FERTILIZER SPREADER WHICH SKILLFULLY COPE WITH THE TASKS OF SPREADING IN WEDGES AND ON RESIDUAL AREAS ON WORKING WIDTHS FROM 24 M.

F4' is a fertilizer spreader for professional use where efficiency and profitability are of vital importance. The spreader is designed to meet various requirements for graduated fertilizing, headland spreading, spreading in wedges and on residual widths.

The spreader is operated via ISOBUS with newly developed software.

F4 is built as a mounted spreader with a hopper capacity of 1500-4000 liters.





CONSTRUCTION

Bredal spreaders have a robust construction and are designed for professional use. Every component of each Bredal machine is constructed with optimal reliability and strength to ensure the longest possible working life.

> CONSTRUCTION

F4 is designed to resist hard pressure that occur under practical conditions in the field.

Bredal always tests modifications and new designs meticulously before launching products onto the market, because as experience shows, the machines are exposed to heavy loads and challenging conditions in their practical surroundings. F4 is provided with a heavy constructed chassis.

In the whole construction priority has been given to minimizing daily maintenance.

The spreader's chassis consists of 2 parts, the upper part and the lower part, between which two 8-ton weighing cells are mounted. Both the upper and the lower frame parts are very strongly built. In case of coupling to a tractor, pins of category 3 are used.

The frame is built of heavy profile metal and is reinforced at all exposed areas, the hopper is built of 3-4 mm plate. The robust construction results in very good durability of the spreader.

Belt tensions are made as cassettes. Back roller has a continuous stainless steel axle and bearings are totally maintenance free. Front roller is equally made of plastic and has maintenance free bearings. Each conveyor belt is pulled by oil engine, which regulates conveyor's speed via a gear box.

At the back the spreader is provided with a folding ladder, which gives easy access to the hopper. It is also possible to mount a platform at the back of the machine which is a practical solution in case of loading from large sacks.

The vanes on the discs are made of stainless steel and are coated with a wolfram carbide wearlayer for longer working life.

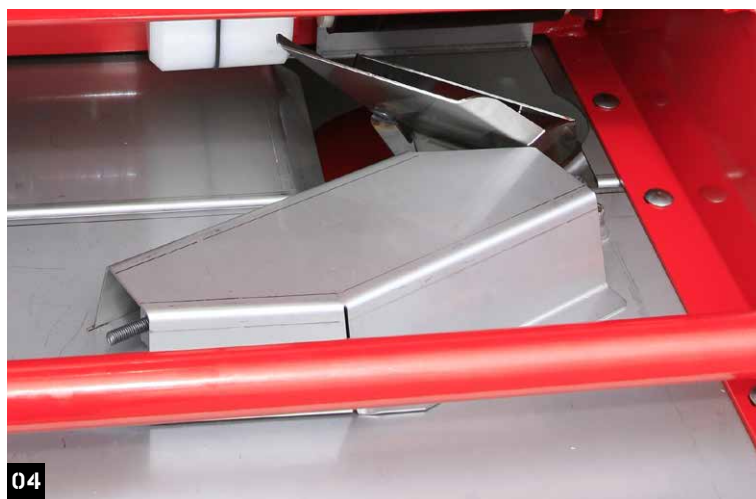
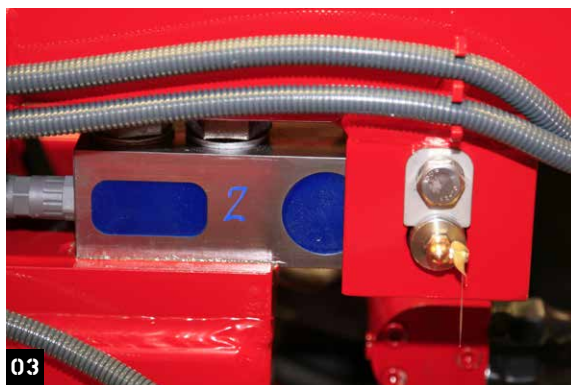
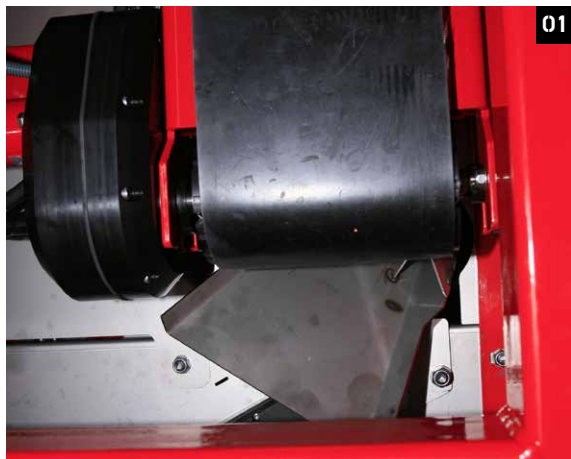
> POWDER COATING

All painted parts on Bredal spreaders are painted with 2 layers of powder paint which gives a strong surface, a good corrosion protection and a beautiful finish.

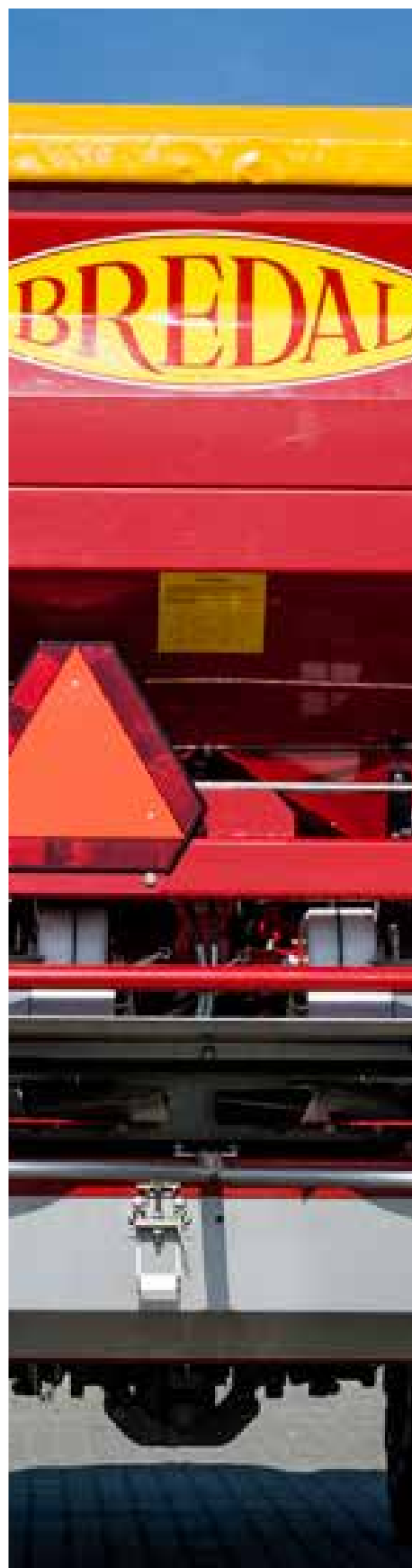
Bredal spreaders are designed as high-quality machines with longest possible working life, and in this context qualitative paint finish is vitally important.

BREDAL has made an extensive investment into painting system, as the result it has one of Denmark's largest and most modern powder painting facilities where machine parts are first shot-blasted and then powder painted with their primer and top coat layers.

The powder painting system was specifically developed to provide a consistent surface and the highest corrosion and wear resistance for exploitation in tough environment.



1 > CONVEYOR BELT TENSION ON THE RIGHT SIDE IS SHOWN 2 > REAR DOOR IN STAINLESS STEEL 3 > WEIGHING CELLS 2 CELLS mounted on the spreader 4 > ELECTRICALLY REGULATED DOWNCHUTE 5 > LADDER, FOLDING 6 > BREDAL F4 4000 RED-PAINTED F4 4000 liter spreader is shown





The spreaders and all the parts mounted are painted with 2 layers of powder, which gives a strong surface and a beautiful finish.

01



02



03



04



05



1 > BREDAL F4 2 > REAR DOOR SCALE 3 > SENSOR MOLDED INTO PLASTIC 4 > STAINLESS HOPPER AND EXTENSION 5 > F4 4000 LITER

BREDAL F4

All hydraulic hoses are gathered at the front of the machine and suspended through a weight relief swivel ring over to the tractor. The hoses can be hung up onto a crossbar when the machine is disconnected from the tractor.

The machine is provided with 2 conveyor belts that are operated independently of each other so that at the same time there can be applied different dosing on the right and on the left sides. The belts are pulled by an oil engine which is regulated via a p-valve.

The position of downchutes is operated by one of the two oil engines and is controlled automatically by the computer. When a working width is chosen, the downchute position gets fitted accordingly. On F4 the position of downchutes is adjusted individually for each belt, this is equally applied for headland spreading.

Computer control for downchute positioning has an in-built software with automatic flow adjustment, thus the position of downchutes is self-regulating to actual outflow amount. Practically it means that no changes occur in the spreading pattern, regardless of the amount of fertilizer on load.

Electric engines of downchutes are made of stainless steel and are well-protected by screening.

All moveable parts of the rear door are made of plastic or stainless steel which results in minimal maintenance need.

Spreader's computer control system has an integrated tilt sensor which is applied to adjust the weight signal so that the weight displayed is always the correct one, includingly when driving on sloping terrain. The amount spread out is furthermore adjusted with the help of the tilt sensor, so the spreader doses correct amount, no matter how the spreader is driving - up or down the hill.

In case the machine is equipped with weighing cells, dosing process is monitored and adjusted non-stop when driving.

The sensors applied e.g. for measuring revolutions on the discs, conveyor belt speed etc have a stainless housing. For further protection they are molded into a plastic bearing which is in its turn sealed with silicone. All cables to sensors, weighing cells etc. are conducted into a protective flex hose to achieve maximal isolation.

**F4 IS BREDALS NEW MOUNTED
FERTILIZER SPREADER WITH A
CAPACITY OF 1,5 - 4 M³.**





SPREADING OF FERTILIZER

F4 spreaders are designed to spread with high precision on large working widths.

F4 spreaders work according to the 4-double overlap principle where each disc is spreading double working width. This principle ensures achieving good spreading results.

Bredal spreaders are designed to send fertilizer grains out at high exit speed. This rapid acceleration combined with a low exit angle (7 degrees) minimizes the risk of wind sensitivity in field conditions.

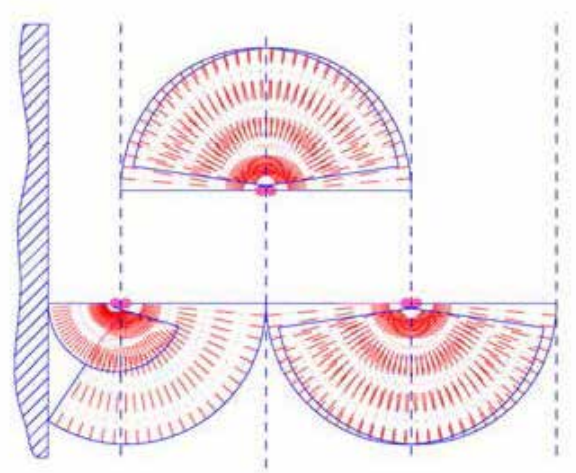
Fertilizer is delivered to the centre of each disc without touching the vanes, where it is then accelerated even before contacting the vanes. This reduces considerably the risk of damaging fertilizer in the process of spreading.

The 6 vanes mounted on each disc provide that fertilizer is being sent out in smaller portions hence securing the spreading process.

The large diameter (Ø72 cm) of spreading discs provides a high rate of acceleration for fertilizer grains just before they leave the disc. At PTO speed of 1000 rpm fertilizer grains accelerate up to 250km/h which considerably reduces wind sensitivity.

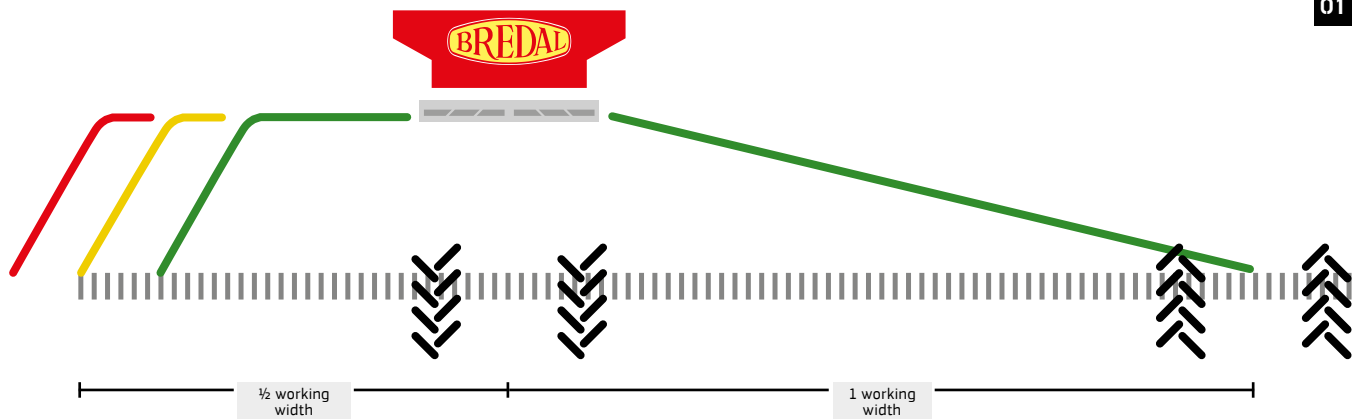
> H-DISCS

For spreading of fertilizers such as Granular Urea, Potash or Ammonium Sulphate, Bredal can supply a kit of special discs for working width of 24-36 m.



HEADLAND SPREADING

01



02



The unique headland spreading system on Bredal spreaders works by reducing the speed on one disc only, resulting in a lower application rate and reduced spread distance towards the headland. The disc on the field side is not affected and retains the optimal spreading pattern towards the next track and ensures the full overlap.

Due to Bredal system of headland spreading a neat boundary at the division line will be achieved at the same time with preserving the actual spreading pattern towards the field. Operation of headland gear is easy.

03



When headland spreading is on, the position of downchutes changes automatically, so the best possible spreading result is achieved.

04



1 > HEADLAND SPREADING PRINCIPLE 2 > BREDAL F4 3 > SPC 4500-1 HEADLAND "closeup" of the gearing 4 > HYDRAULIC SHIFTING OF HEADLAND GEAR

SPREADING TESTS

> TESTED SPREADERS

All Bredal spreaders are regularly tested with a wide range of fertilizer types at the independent spreading test centre at Bygholm (part of Aarhus University).

Test results are based on weighing cells technique, according to which it is the actually spread amount collected in each tray which is taken for results evaluation, not a theoretical calculation.

Bredal uses this very testing centre because the surrounding conditions here are as close to practical farming conditions as possible.

> BREDAL SPREADING PRINCIPLE

Bredal K spreaders use the 4-double overlap system. Here both discs cover double working width, i.e. when spreading on the width of 24 m the left disc covers 24 m to the right and 24 m to the left. Accordingly, the right disc is a mirror image in its turn covering 48 m in total. Thus a 4-zone distribution mode is achieved which provides high precision and minimal risk of making spreading errors.

Bredal spreaders are designed to send the fertilizer grains out at high exit speed. This rapid acceleration combined with a low exit angle (7 °) minimizes the risk of wind sensitivity in field conditions.

> BREDAL TEST KIT

Bredal test kit is used to perform practical spreading tests for the purpose of optimizing the spreading pattern.

The kit consists of test plastic trays incl. dividers, measuring tubes with holders, a funnel, a granule strength tester and a sieve box to check the granule sizes.

> SETTINGS

Optimal spreading settings for various fertilizer types can be downloaded from Bredal homepage.



1 > A SIEVE TO MONITOR GRAIN SIZES 2 > CALIBRATION KIT 3 > MEASURING TUBE TO CONTROL SPREADING TEST RESULTS 4 > BREDAL TEST KIT TEST KIT INCLUDES plastic trays with dividers, measuring tube, funnel, granule strength tester and a sieve **5 > SPREADING TEST IN THE FIELD WITH BREDAL AND TEST KIT** (trays positioned on the field)

STANDARD EQUIPMENT

HOPPER SCREEN IN STAINLESS STEEL >

When spreading fertilizer it is important to have a screen inside the hopper to avoid lumps, mud etc. affecting the application rate. The screen is made of stainless steel.



< CROSSBAR FOR HYDRAULIC HOSES AND OVERVIEW PANEL

All hydraulic hoses are gathered at the front of the machine. The hoses can be hung up onto a crossbar when the machine is disconnected from the tractor.



LADDER >

A ladder at the back of the spreader providing easy access to the hopper.



WINDOWS >

There is a window on the frontal part of the hopper which makes it easy to monitor hopper contents.



< CONVEYOR BELT TENSIONING

Each belt is pulled by an oil engine via a gear. Oil engine revolutions are regulated via a p-valve.

STAINLESS STEEL REAR DOOR >

The rear door is in stainless steel, with nylon guidance runners for easy adjustment, long life and minimal possible maintenance.



STANDARD EQUIPMENT

PTO >

All spreaders are supplied with a wide angle 6z PTO shaft.
Alternatively an 8z, 20z or 21z can be specified.



< LED LIGHTS

Bredal spreaders are equipped with LED lights and side marker lights.



DOWNCHUTES AND CONVEYOR DOSING BELT >

Electrically operated downchutes with flow control which automatically adjusts itself to chosen working widths. The machine is equipped with 2 belts, so the dosing on them can be operated independantly of each other on the right and on the left side.



SPRING LOADED TIGHTENER >

Spring loaded firming of V-belts ensures their proper tightening.



< SPREADING UNIT

F4 is supplied with a SPC4500-1 belt transmission, spreading discs for 12-36 m working width and headland gear for 24-36 m working width.

ISOBUS CONTROL >

F4 is delivered only with computer control via ISOBUS







ADDITIONAL EQUIPMENT

HOPPER EXTENSION >

Hopper extension for providing bigger capacity for F4 is offered in the following versions: standard 1500 liter plus 2500, 3000, 3200 or 4000 liter. Hopper extension can also be supplied in stainless steel.



< PLATFORM

It is also possible to mount a platform at the back of the machine which is a practical solution in case of loading from large sacks.

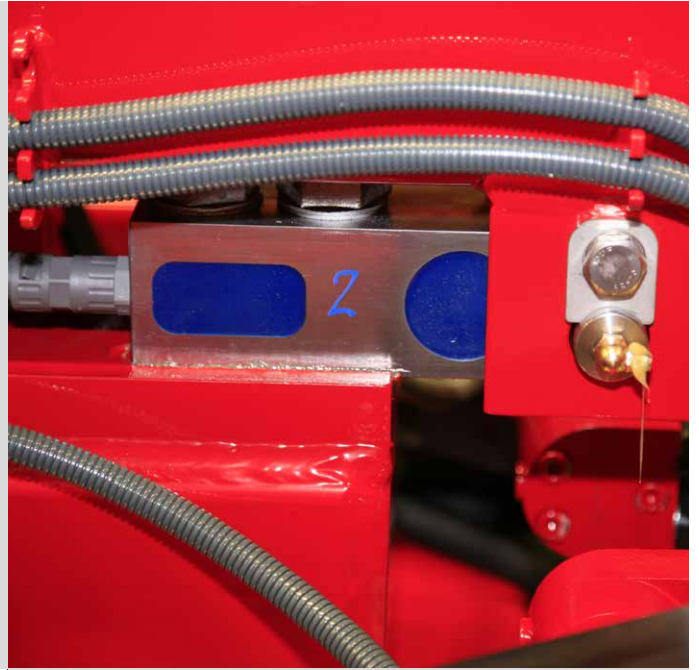
HYDRAULIC HEADLAND GEAR >

Hydraulic headland gear can be specified for a convenient switch from a tractor cab between headland and in-field spreading.



WEIGHING CELLS >

Weighing cells provide 100% control over fertilizer distribution. F4 automatically adjusts the dosing with the help of weighing cells during the working process.



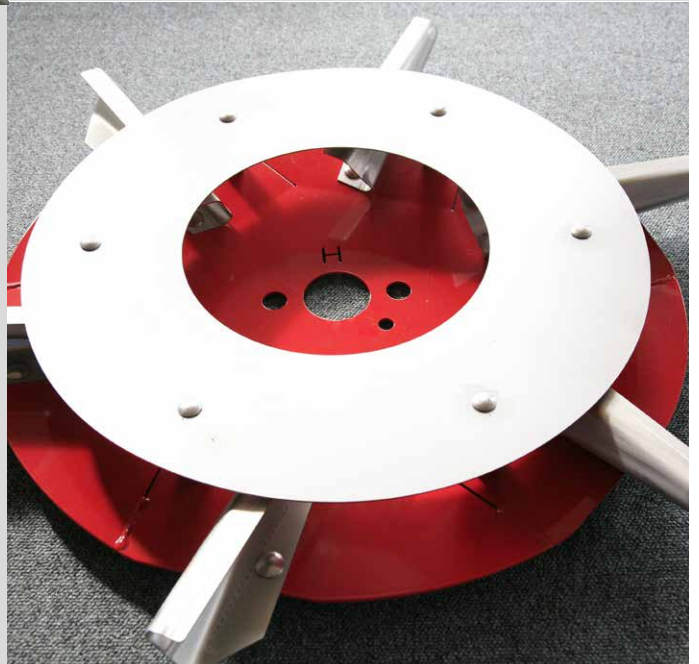
< CALIBRATION KIT

A weighing kit for determining fertilizer bulk density in a simple and precise way. To ensure the correct dosing in spreading it is important to know the right bulk density of the fertilizer applied.



‘H’ - DISCS KIT >

Specially designed equipment for spreading such fertilizers as Granular Urea, Potash and Ammonium Sulphate at working widths of 24-36 m.



ADDITIONAL EQUIPMENT

HOPPER IN STAINLESS STEEL >

To simplify cleaning tasks and maintenance it is possible to specify a hopper in stainless steel.

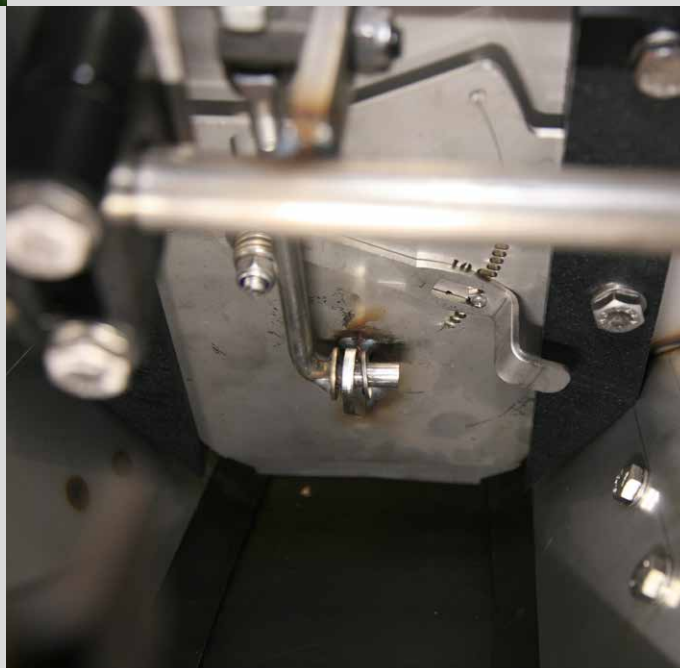


< COVER

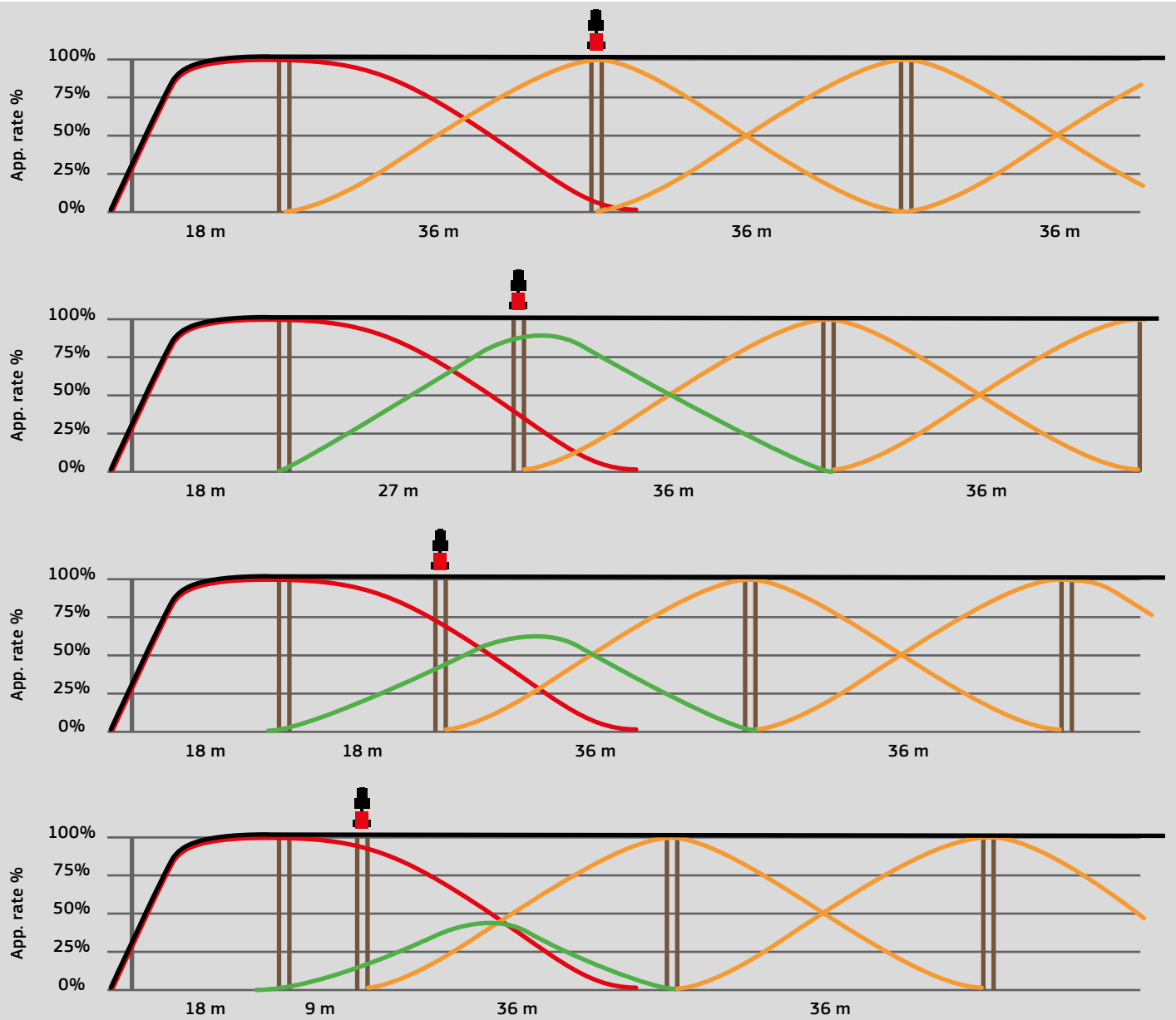
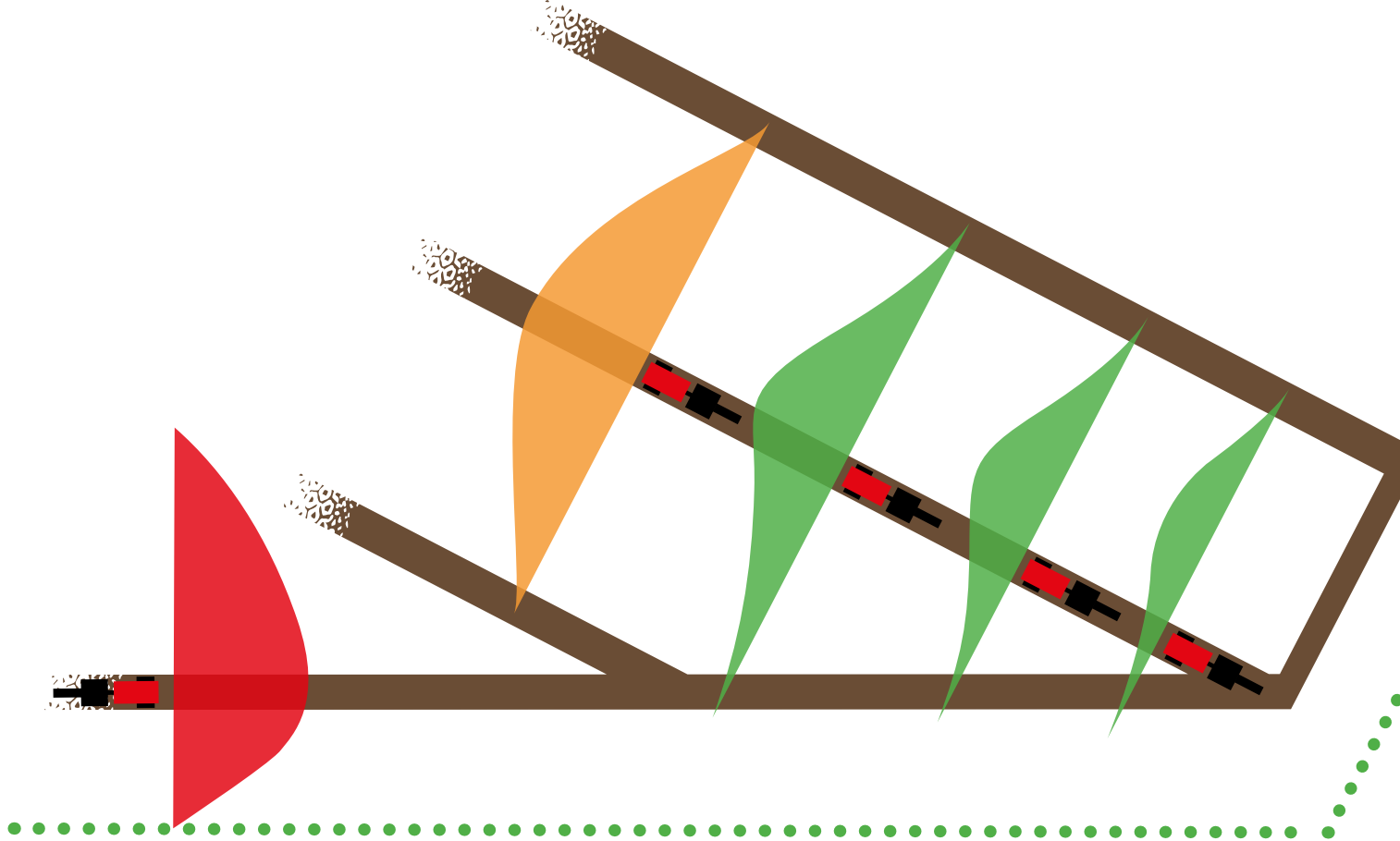
To protect hopper contents during road transport and spreading, a cover can be specified.

MICRO DOSING EQUIPMENT >

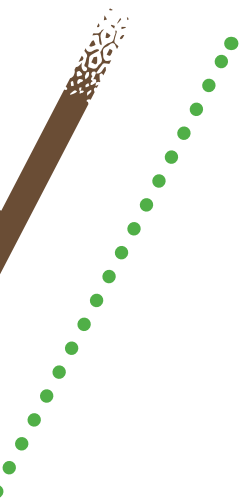
Micro dosing equipment is used for applying very low rates, such as slug pellets, rape seed or microfertilizers. It is possible to spread at rates as low as a few kg/ha.







SPREADING PRINCIPLE



36 m working width in the field shown together with headland spreading.

A common spreading pattern without residual area.

36 m working width with residual area on 27 m.

The centre of the spreading pattern (marked green) is shifted approx. 3 m to the right from the track, and the amount of output quantity is reduced.

36 m working width with residual area on 18 m.

The centre of the spreading pattern (marked green) is shifted approx. 10 m to the right from the track, and the amount of output quantity is further reduced.

36 m working width with residual area on 9 m.

The centre of the spreading pattern (marked green) is shifted approx. 12 m to the right from the track, and the amount of output quantity is considerably reduced.

F4 is constructed with 2 dosing belts which can dose independently of each other, so that the amount of fertilizer can be continuously adjusted, when the tractor drives into a wedge on the field. When moving forward along the wedge, the amount is gradually reduced on the side facing the wedge, so the correct dosing is achieved. The same forward mode is applied when moving in a residual width within the field, dosing on the side facing the residual width is reduced, in this way the right amount is always spread, neither too little nor too much.

It is shown on the left how the spreading pattern is changing gradually when the spreader moves forward in a wedge on the field, and the amount is reduced (marked green)

Below is the principle of spreading pattern for different residual areas between headland and tracks in the field. When the residual width gets smaller, the amount of output quantity on the according side of the spreader is also reduced, so the total amount spread in the field always matches the encoded number.

ISOBUS section control is used to regulate the amount of spread material. Section control program can be found on most of ISOBUS terminals, and is required for activating the function of regulating the amount of spread material in wedges and on residual areas. One of the advantages of using the software already existing on the terminal is that it not only can be used by spreaders but also by field sprayers, seeding machines etc. which is the main idea of having ISOBUS system.

Each year Bredal performs a number of spreading tests with various fertilizer types found on the market. Settings for different fertilizer types can be downloaded from our homepage, so that an optimal setting for each fertilizer type can always be found.

We monitor and optimize current settings, and there is a big focus on active developing and improving e.g. headland spreading, where, as a novelty, we offer independent downchute positioning on the right and the left sides. Another novelty is an automatic reduction of output quantity on headland side, when headland gear is switched, precisely to optimize on spreading pattern when spreading at headland.

COMPUTER CONTROL/ISOBUS



> ISOBUS

ISOBUS solution is developed in collaboration with TeeJet, with focus on simplicity in user interface, which is easy to encode daily settings. F4 is developed exclusively for ISOBUS solution.

> SECTION CONTROL (UP TO 12 SECTIONS)

Bredal applies the same software as field sprayers use for section control, which is a component of most ISOBUS terminals. This means operation is the same, regardless of the type of machine that uses it.

> MÜLLER TRACK GUIDE III

In case the tractor is not equipped with an ISOBUS terminal, Bredal can offer a touch-screen in colour from Müller, together with a complete mounting kit and GPS antenna along with necessary software. Müller terminal can be used together with other ISOBUS tools, it also contains a track guidance program.



Bredal computer control for F4 is designed exclusively for ISOBUS. There has been put a big focus on designing a user interface which is easy and user-friendly and at the same time contains all the required functions.

The software is developed in collaboration with Teejet which has many years of experience in developing solutions for agricultural sphere and has been Bredal's supplier for over 25 years.

With the new F4 there appeared a range of new functions that haven't been offered by Bredal until now. Most important of them are wedge and residual spreading, automatic switching of dosing when turning at headland.

There are also other useful functions built in, such as tilt sensor adjusting the output amount when the spreader drives at slopy terrain, which provides very consistent dosing pattern. The tilt sensor is also applied to correct the weight signal, so that the correct weight is always displayed when driving at slopy terrain.

Downchute position is chosen automatically when working width is encoded. Besides, when driving, the settings continuously get adjusted to the spread amount, so that the best possible spreading pattern is always achieved, no matter how the spreader moves, slowly or quickly. Both downchute positions for spreading in the field and settings for headland spreading can be easily changed, if it is necessary for optimizing the spreading pattern.

All functions are monitored when the machine is in action, and various data indicators are shown on displays to the driver.

The functions described above are some of a wider range of functions available on a Bredal newly developed F4 fertilizer spreader. A combination of these functions ensure an optimal distribution of fertilizer in the field.



F4 TECHNICAL SPECIFICATIONS

> F4 1500 TECHNICAL SPECIFICATIONS

Capacity:	1,50 m ³
Net weight:	835 kg
Spreading unit:	SPC4500-1

Hopper length:	1520 mm
Hopper width :	2400 mm
Loading height (standing on the ground)	1500 mm

> F4 2500 TECHNICAL SPECIFICATIONS

Capacity:	2,50 m ³
Net weight:	880 kg
Spreading unit:	SPC4500-1

Hopper length:	1520 mm
Hopper width :	2400 mm
Loading height (standing on the ground)	1765 mm

> F4 3000 TECHNICAL SPECIFICATIONS

Capacity:	3,00 m ³
Net weight:	890 kg
Spreading unit:	SPC4500-1

Hopper length:	1520 mm
Hopper width :	2400 mm
Loading height (standing on the ground)	1890 mm

> F4 3200 TECHNICAL SPECIFICATIONS

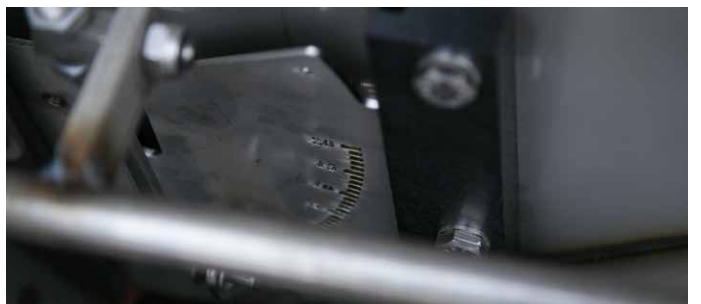
Capacity:	3,20 m ³
Net weight:	965 kg
Spreading unit:	SPC4500-1

Hopper length:	1520 mm
Hopper width :	3000 mm
Loading height (standing on the ground)	1970 mm

> F4 4000 TECHNICAL SPECIFICATIONS

Capacity:	4,00 m ³
Net weight:	985 kg
Spreading unit:	SPC4500-1

Hopper length:	1520 mm
Hopper width :	3000 mm
Loading height (standing on the ground)	2100 mm

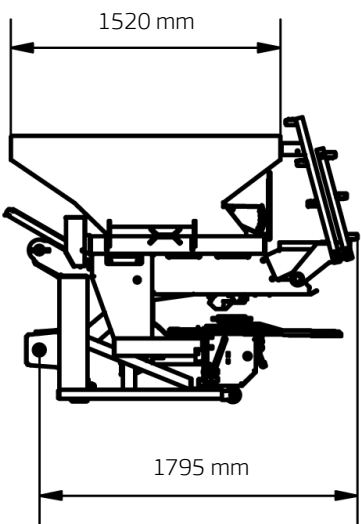
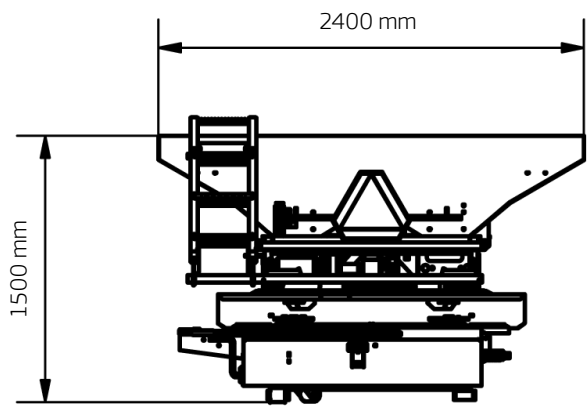


EQUIPMENT OVERVIEW

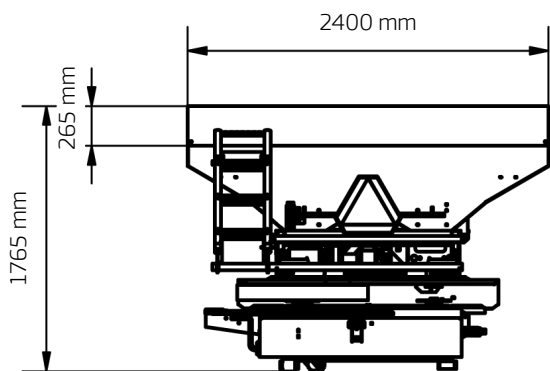
EQUIPMENT	F4		
	Standard	Additional	Not possible
LED light kit	o		
12-36 m spreading discs	o		
24-36 m spreading discs, type : 'H'		o	
Power transfer, 6z PTO shaft with wide angle	o		
SPC4500-1 spreading unit	o		
Headland gear for headland spreading	o		
Weighing cells		o	
ISOBUS, computer control	o		
Calibration kit		o	
Hopper extension (up to 4000 liter)		o	
Screen, in stainless steel	o		
Cover		o	
Hopper, in stainless steel		o	
Rear door, in stainless steel	o		
Micro dosing equipment		o	
Late application equipment		o	
Inspection window in front	o		
Ladder, folding	o		
Step inside the hopper	o		
Platform		o	

F4 DIMENSIONAL SKETCHES

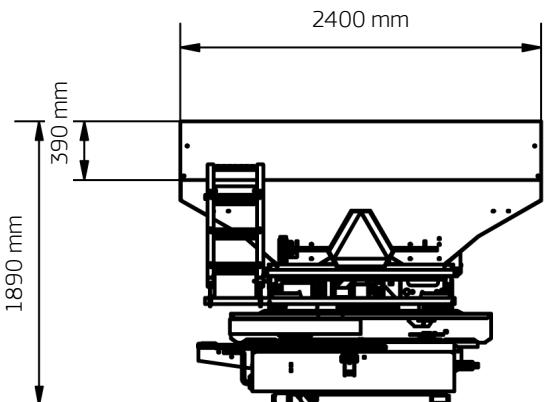
F4 1500



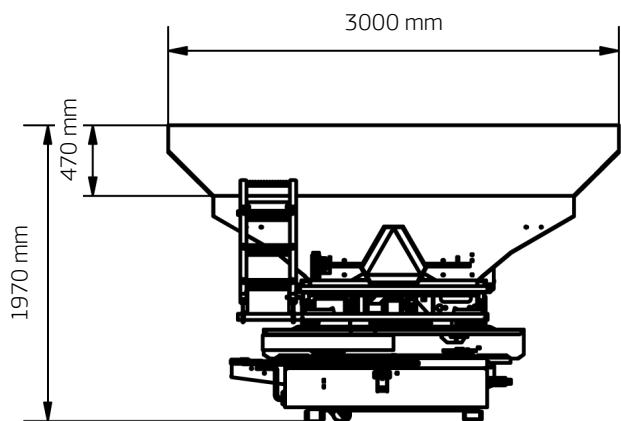
F4 2500



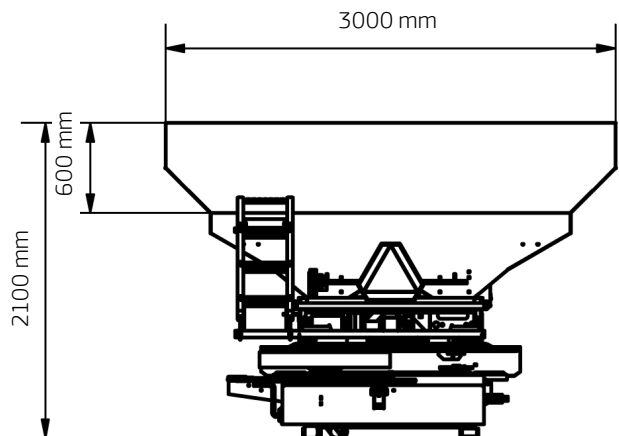
F4 3000



F4 3200



F4 4000





SIMPLE
PRECISE
RELIABLE

For more than 50 years Bredal has been specializing in production of high-quality lime and fertilizer spreaders for agricultural purposes. The company's goal is to build reliable machinery, precise in exploitation, simple in operation and maintenance. In recent years Bredal product line has been expanded to include winter equipment in the form of sand and salt spreaders.

The company's interests in most of the 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 top modern production facilities with latest equipment used for producing the high-quality machines.

