

PENDULUM FERTILIZER SPREADERS

Rochä

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INTRODUCTION

CHAP1

Congratulations on your acquisition of a ROCHA product, you have indeed made the right choice and will soon see with your own eyes how reliable and robust this remarkable product truly is.

We hope that this equipment will fully meet all your expectations.

The purpose of this manual is to help you better understand how to operate the spreader.

The rules and recommendations help you to take advantage of this equipment's potential, ensuring that it is used as safely and efficiently as possible.

ESTE MANUAL É PARTE INTEGRANTE DA MÁQUINA.

Manufacturer Name and Address

Conformity Certificate

Rochä
PULVERIZADORES ROCHA, LDA

Rua 1º de Maio 38- Milheiros
4471 - 909 MAIA
Telef. 22 9601793/4
Fax. 22 9600867



Model

Modelo - DISTRIBUIDOR PENDULAR

Capacity

Cap.: 500

Code

Cód.: 93010052

Part Number

Série: 0276

Ano: 2008

Year of Manufacture

EQUIPMENT IDENTIFICATION

CHAP2

The identification label placed on the machine chassis contains essential information that is required in order to correctly identify the equipment.

This data must be provided whenever accessories are requested or when technical support is necessary.

WARRANTY

CHAP3

The products sold by PULVERIZADORES ROCHA are submitted to rigorous quality control testing in order to minimize the occurrence of any defects.

All equipment has a two-year warranty, counting from the date it is acquired. Any defective components or parts due to manufacturing and /or workmanship defects shall be immediately substituted at no additional cost.

However, workmanship and travel costs will be applicable.

When complaints are submitted, the parts in question must be sent for examination by our Technical Department.

The occurrence of any of the facts described below shall result immediately in the invalidity of the warranty:

- 1.** The use of the equipment under abnormal work situations or coupled with motors/tractors/hand tractors with power specifications that differ from those recommended in the respective technical documents.

- 2.** The substitution of any components or parts by others from 3rd parties
- 3.** Any structural alterations made to the equipment.
- 4.** PULVERIZADORES ROCHA are not informed nor give their consent regarding any repairs made during the effective warranty period.

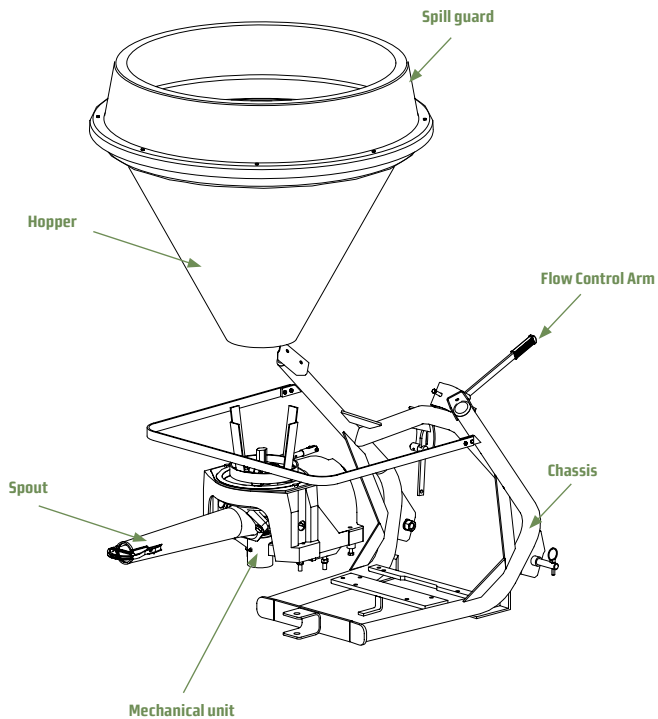
DESCRIPTION

CHAP4

This pendulum fertilizer spreader /seeder has been devised to spread granulated or powder fertilizer, lime and seeds in general with great precision.

The need for precision and versatility involves the implementation of state-of-the-art spreading technologies. ROCHA pendulum spreaders respond to the need to spread fertilizers and make the most of their application, assuring the growth and the quality of the crop.

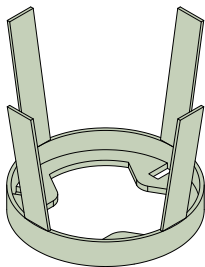
Whatever the product, this mechanical unit shall ensure the most balanced spreading pattern possible.



In order to spread fertilizer in crop rows, such as fruit orchards, all that is required is to replace the standard spout (07665) with the special spout (70445), and in this way the fertilizer will be spread in two separate bands, at the foot of the tree. The distance between the two bands may vary according to the length of the pendulum.

All the models in the ROCHA range use an identical mechanical part, and only the capacity of the hopper varies between 250 and 1500 litres, according to your needs and the agricultural tractor that is being used at the property.

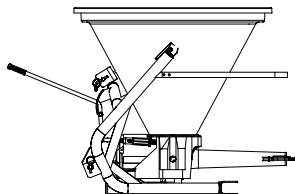
The effective spread width varies between 6 and 14 metres, basically depending on the specific weight characteristics of the product that is being spread.



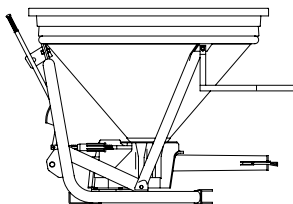
The ROCHA pendulum fertilizer spreader /seeder is equipped with a standard agitator, guaranteeing a continuous flow in the distribution of dry and granulated products and seed

If the product being spread is humid (lime and hygroscopic fertilizers), the additional agitator must be mounted.

IF YOU HAVE ANY DOUBTS, PLEASE CONSULT OUR TECHNICAL DEPARTMENT.



KP 400



KP 600

KP

MOD	CLT	CKG*	HEI	WID	WEI
KP 300	250	268	1080	1010	108
KP 400	300	321	1070	1250	115
KP 500	400	428	1160	1280	120
KP 600	500	535	1260	1280	121
KP 600Q	470	503	1030	1290	138
KP 700Q	570	610	1120	1310	144
KP 800Q	670	717	1250	1310	146

KP R

MOD	CLT	CKG*	HEI	WID	WEI
KP 1000 R	900	963	1115	1910	230
KP 1300 R	1200	1284	1315	1910	256
KP 1600 R	1500	1605	1465	1910	263

MOD (MODEL); **CLT** (CAPACITY-lit.); **CKG** (CAPACITY-kg); **HEI** (MAXIMUM HEIGHT-mm); **WID** (maximum width-m); **WEI** (WEIGHT-kg).

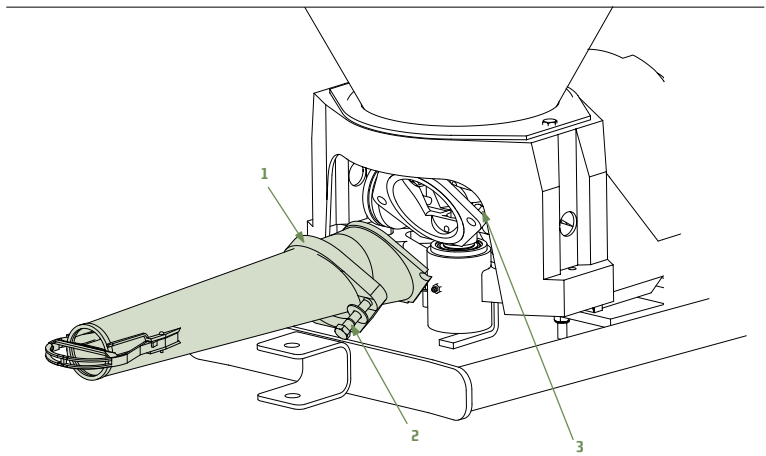
*HOPPER CAPACITY IN kg - BASED ON FERTILIZER GRANULES WITH A DENSITY OF 1.07

TECHNICAL SPECIFICATIONS

CHAP5

General specifications:

- 2" (KP), 2"1/2 (KPR) steel tube chassis.
 - Thermoset polyester resin coating.
 - Mechanical spreading unit with precision adjuster.
 - Stainless steel INOX A4 parts in direct contact with fertilizer.
 - High-density polyethylene hopper.
 - Agitator.
 - 21hp x 800 mm (KP) cardan shaft; 21hp x 1000 mm (KPR) cardan shaft.
-



PENDULUM ASSEMBLY

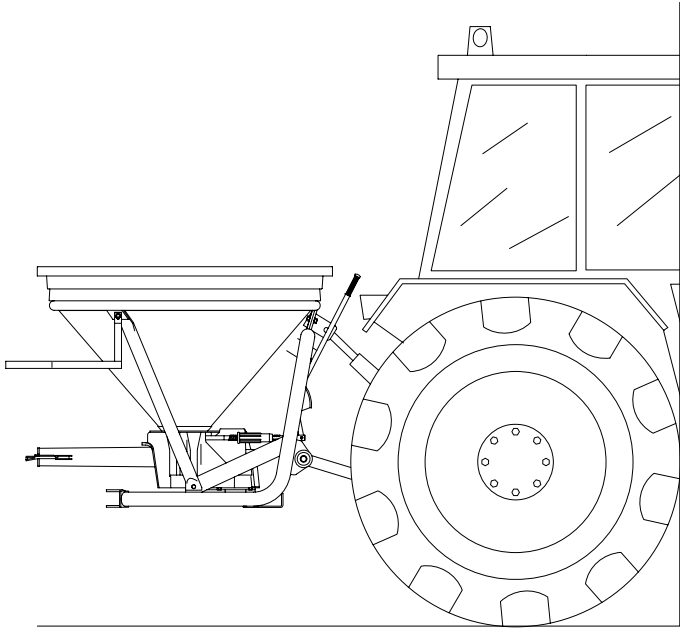
CHAP6

In order to limit the size of the machine during its transportation, the pendulum spout is not assembled. In order to assemble the pendulum spout, please follow the instructions provided in the image below.

Procedure:

- Place the flange (1) above the pendulum spout.
- Place the bolts and washers (2) and (3).
- Fasten the nuts securely.

We recommend that you should always check that the pendulum bolts are tightly fastened in order to avoid any damage to them.



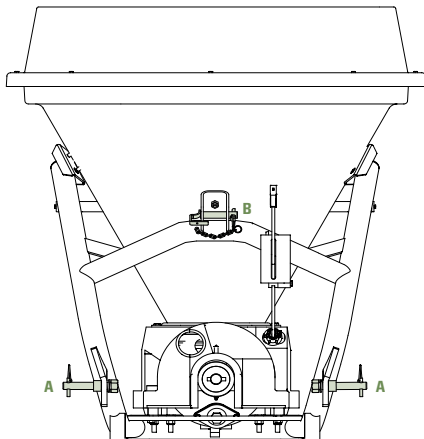
MOUNTING ON TRACTOR

CHAP7

ROCHA fertilizer spreaders have been conceived in such a way that they are easily mounted on tractors.

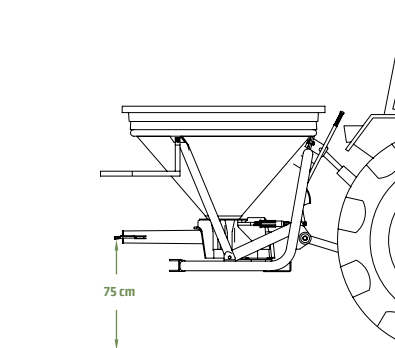
For this reason, certain extremely important procedures should be observed:

- 1.** The cardan shafts supplied by ROCHA are standardized and are provided with an instruction manual that should be read carefully.
- 2.** Its transmissible power should be at least equal to that absorbed by the spreader.

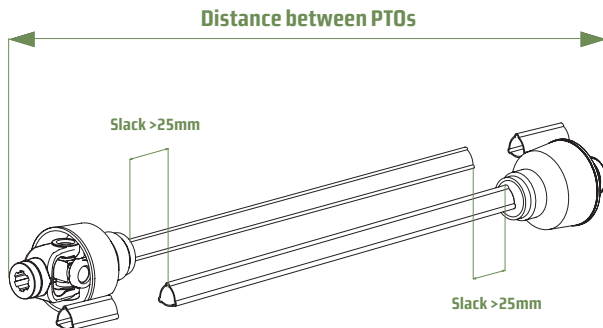
MACHINE COUPLING

1. Connect the lower hydraulic arms to the Spreader's rods (A).
2. Connect the "third point lever" to the Spreader's link pin (B).

3. Lift the machine until the cardan is horizontally in line with the PTOs of both the mechanism box and the tractor.



4. Place the half cardan connected to the machine and the half cardan connected to the PTO beside each other.
 - 4.1 If they are too long, cut the two tubes and respective safety covering with between a minimum of 25mm slack and a maximum of 50mm slack.
 - 4.2 Get rid of the trimmings resulting from this cut and lubricate the thinner tube on the outside.

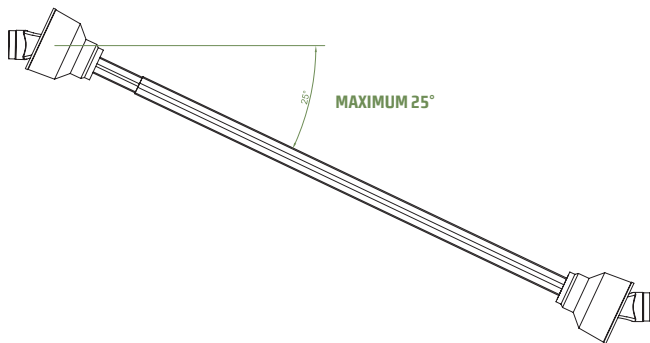


5. Attach the cardan chains.
6. Adjust the slack on the lateral stabilizers of the tractor arms to a maximum of 50mm.
7. Adjust the third point lever of the tractor so that the spreader is in a fully vertical position.
8. Make sure that the weight of the equipment at maximum load can be supported by the tractor.



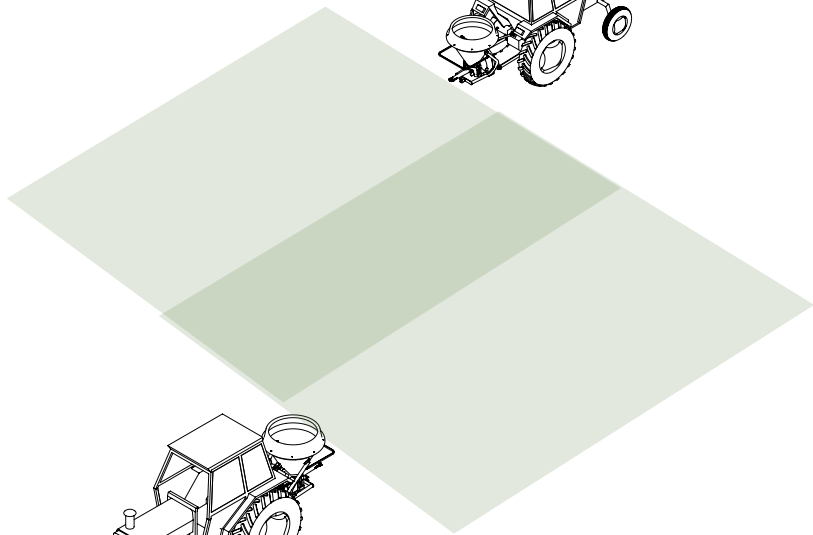
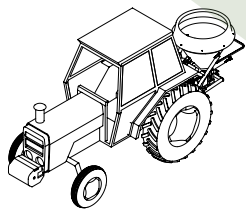
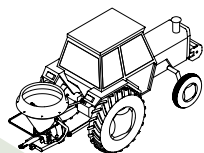
ATTENTION!

The angle of the cardan must not exceed 25° during operation.



ATTENTION!

The machine should be coupled with the tractor by specialized staff and its use is not recommended for inexperienced people or under 18 year olds.



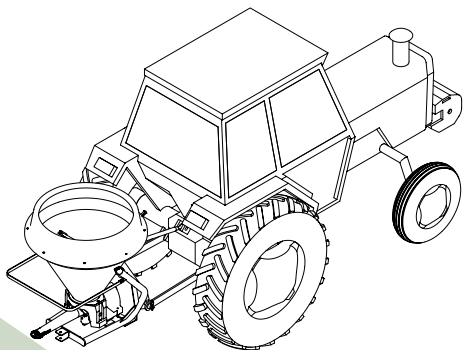
OPERATION/ CALIBRATION

CHAP8

The mechanical spread of fertilizer and seeds, whether by pendulum or centrifugal, will always lead to a greater concentration of fertilizer in the centre and a lower concentration on the edges .

In order to obtain a uniform distribution the edges must be compensated. The most practical way to do this is, on the next pass, to keep the tractor along the edge of the grains spread on the previous pass.

The spread of pendulum systems has the shape of a rectangular strip.



HOW TO ADJUST THE FLOW OF FERTILIZER

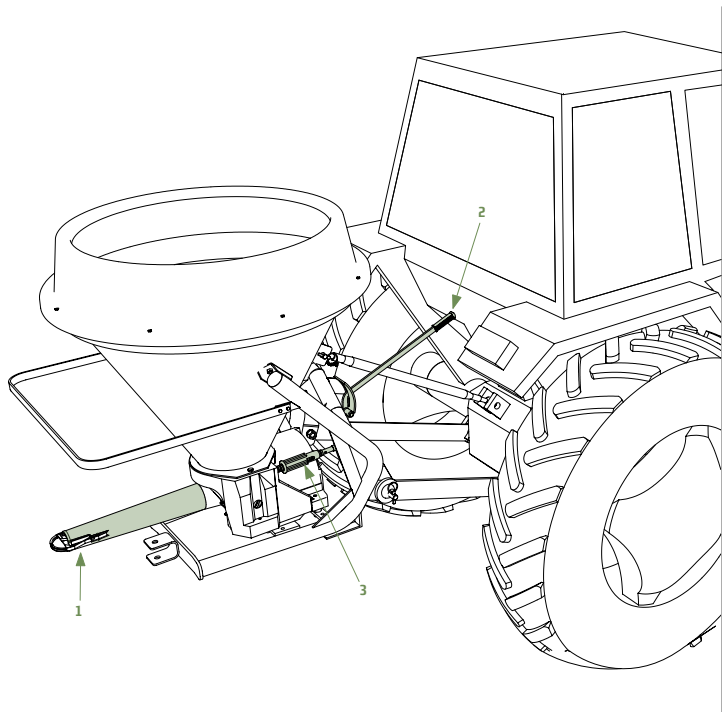
The calibration of the flow of fertilizer can be done manually or according to the spreading table provided in Chapter 9.

Working with the PTO at 540 rpm, the amount of fertilizer placed per m² or at the base of trees depends on two factors:

- How wide open the flow adjuster is.
- The tractor's speed.

Also for financial reasons, it is very important to apply the recommended amounts of fertilizer according to the characteristics of the soil and the crop in question.

Before starting to spread the fertilizer, the spreader should be precisely calibrated. This operation helps reduce costs and permits higher quality application.



EXAMPLE: Distribution of 150kg/hectare

1. $150 \text{ kg/hectare} = 150\,000\text{g}/10\,000\text{m}^2 = 15\text{g per square metre.}$
2. If the tractor operates at $6\text{km/hour} = 6000\text{metres in } 60\text{ minutes}$, it works at 100m/minute.
3. The effective spread width during operation is 8 metres.
4. So we know that in one minute of operation an area of $8 \times 100 = 800\text{m}^2$ is covered.

Now, $800\text{m}^2 \times 15\text{g}$ (see point 1 above) means $12\,000\text{g} = 12 \text{ kg per minute.}$

5. In view of this result of 12kg/min we can calibrate the application rate by consulting the spreading table in Chapter 9 or, alternatively, according to the following method:
 - a. Dismount the pendulum spout (1).
 - b. Place a container underneath.
 - c. Close the flow control arm (2).
 - d. Rotate the scale dose adjuster to its intermediate position (3).

- e. Put the PTO at 540 rpm, open the flow control arm and weigh how much fertilizer is released in 1 minute.
- f. Keep experimenting, changing the scale dose adjuster, until 12kg/minute is released.
- g. Note down the scale number for future reference.

HOW TO ADJUST SPREADING FERTILIZER IN TWO BANDS



LENGTH. PENDULUM SPOUT (mm)	500	350	250	195	80
WIDTH BETWEEN BANDS (m)	8,5-9	7,5-8	5-5,5	4-4,5	3-4

In order to perform the spread of fertilizer in two bands, substitute the standard pendulum spout by a pendulum spout without a nozzle. The distance between bands depends on the length of the pendulum spout without nozzle.

EXAMPLE: Distribution of 150kg/hectare

In order to calibrate the nozzle in order to distribute the amount of fertilizer desired along the base of the trees, you should proceed in the following manner:

1. The orchard was planted with a 3-metre gap between trees and 4 metres between each row.
2. If the tractor operates at 6km/hour = 6000 per hour, it covers a distance of 100 metres per minute.
3. Over 100 metres 33 trees are fertilized on either side = a total of 66 trees.
4. We wish to place 50g fertilizer per tree, and so we know that each minute $66 \times 50 = 3300 = 3.3\text{kg}$ of fertilizer must be released. So, once again the dose adjuster must be calibrated according to the method described in paragraph “e” in the page above.

In this way we place fertilizer on 66 trees a minute / 3960 trees per hour, which, in practice, adds up to 40 000 trees a day.

In order to spread fertilizer in two separate bands, the standard pendulum spout must be replaced by the special pendulum spout.

According to the length of this pendulum spout, the distance between the two bands varies as described in the table attached.

With a shorter pendulum spout the bands remain closer together.

With a longer pendulum spout the distance between the bands increases.

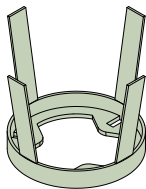


Figure 1



ATTENTION!

Do not use the extra agitator (figure 1) with granulated fertilizer and seeds, in order to avoid damage to these products

SPREADING TABLE

CHAP9

PRODUCT	DOSE ADJUSTER POS (flow rate kg/min)										SPREAD WIDTH mts
	12	18	24	30	36	42	48	54	60	66	
SUPER PHOSPHATES		17,1	27,9	35,1	51,9	71,2	90,4	113,3	142,5		8/15
UREA	5,5	12,3	20,4	29,4							10/12
NITROGENOUS			18	25,8	39,5	54,6	70,5	86,8	107,3	128,8	6/15
AMMONIATE			23	32,4	46,5	58,8	78,1	98	126,5	152,4	8/15
LIMESTONE				29	35,7	49,5	63,5	76,2	90	100,2	9
ORG. GRANULATED			15,3	23,7	33,5	46	60,4	81,6	117,5	129,4	9
OATS	1,2	2,8	5,2	8,7							4/9
ALFALFA (LUCERNE)	2,6	5,1	8,8	9,2	10,8						4/9
BARLEY		5,4	10	16,2	22,5	29,4	37,8				6/12
WHEAT			14,4	24	32,8	46,9	60,5				6/12

The spreading table helps calibrate the fertilizer spreader so that the product is used according to the manufacturer's specifications. This table includes the products that are most commonly used in the market, but if you wish to apply a product that is not mentioned in the chart or in conditions that are not provided for, you should perform the calculations according to the method described above

SAFETY INSTRUCTIONS

CHAP10

It is always important to mention the main safety instructions that the operator of any machine should follow when using that machine, seeing that nonobservance of the rules leads to a quite frightening number of accidents.

In this way, this list serves as a warning in order to prevent accidents.

1. Use by untrained people should be forbidden.
 2. The operator should read the instruction manual and keep it always at hand.
 3. Never lubricate, clean or tweak any agricultural tool when the PTO is in operation.
 4. Never leave the tractor unattended with the motor on. Turn off the engine and remove the key (be careful with children).
 5. No one else should be transported by the tractor, unless a specific seat exists for that purpose.
-

6. Check the following:

- 6.1** The drive shaft is duly protected (plastic protection, fixed by its chain to the tractor);
- 6.2** The bolts, nuts and other connections are duly fastened;
- 6.3** All and any of the machine's or the tractor's protective equipment is in place and duly fixed.
- 7.** In the event of use in public roads the total lane width must not be exceeded, unless a special permit has been given with regard to this.
- 8.** Observe the law with regard to road signs and lights.

Nitrogenous fertilizers may explode. Never allow them to come into contact with fire.

If you need to solder or cut self-fused or electrical equipment, first eliminate the fertilizer residues from cavities and tubing.

APPLYING FERTILIZER

Follow the safety instructions and recommendations made by the manufacturer.

- 1.** Place the fertilizers out of reach of children and animals.
- 2.** Do not mix fertilizers when compatibility is not recognized by their manufacturers.
- 3.** Always use personal protective equipment, such as gloves, mask, goggles etc.
- 4.** Do not eat, smoke or drink during the application.
- 5.** Observe recommended safety distance from housing areas, public areas, reservoirs and watercourses.
- 6.** At the end of each application it is important to clean the exterior and interior of the spreader with clean water, as well as all the clothing used during the application.

SAFETY LABELS

The machine should be used with great prudence. There are labels warning against the main hazards that may occur during the use of the equipment.

The labels are an essential part of the equipment, and if any of them disappear or become illegible, please contact your local dealer in order to replace them.



SEVERAL HAZARDS



READING THE MANUAL IS REQUIRED



DANGER OF BEING TRAPPED



DANGER OF BEING TRAPPED BETWEEN TRACTOR AND MACHINE



ROTATION FREQUENCY AND DIRECTION



PROJECTION HAZARD



KEEP A SAFE DISTANCE



ATTENTION:
IN ORDER TO SERVICE THE MACHINE,
DISMOUNT ALL REMOVABLE PARTS DUE
TO RISK OF BEING TRAPPED



STOP



TORSION, MOVING PARTS AND DANGER OF BEING TRAPPED.



DANGER IN EVENT THAT THE MACHINE IS LIFTED



DANGER OF BEING TRAPPED



SHEAR HAZARD

MAINTENANCE

CHAP11

In order to keep the machine in perfect condition, we recommend that it should be cleaned, and residues removed after each application.

It is important to periodically lubricate all moving parts:

- Cardan
- Levers and arms

PROCEDURE AFTER PROLONGED INACTIVITY

CHAP12

WINTER STORAGE

Following use of the equipment and after it is appropriately cleaned and lubricated, it should be prepared for storage.

The equipment should be stored at a dry and well-ventilated location.

When the equipment is brought back to activity during the fertilizer season, manually rotate the mechanism box PTO and check if the opening and closing lever is fully functional. If necessary, lubricate.



ATTENTION!

Any user who is concerned with the costs, efficacy and productivity always checks the spreader before starting operations.

The substitution of certain parts represents a tiny cost in relation to the cost of the fertilizers that are to be applied.

Therefore, it is preferable to substitute parts at the start of the season rather than halfway during application.

