

# **SAM**

## **SPREADERS**

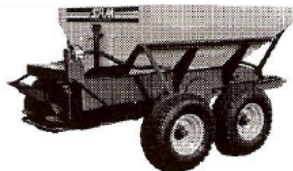
### **OPERATORS & PARTS CATALOGUE**



**Coombridge & Alexander Ltd**

AGRICULTURAL MACHINERY MANUFACTURERS





## OPERATORS MANUAL (single acting clutch ram)

### Introduction

The SAM Bulk Topdressers have been developed through 25 years experience in manufacturing fertiliser spreading equipment. We manufacture a reliable, ruggedly constructed versatile machine with models to suit a range of farming requirements.

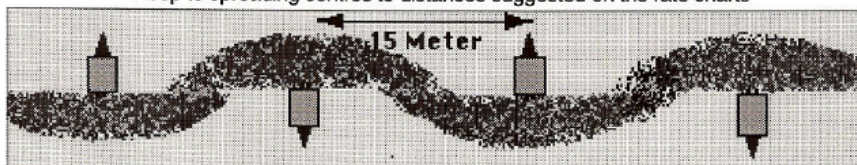
### Operation : Back Door Setting / Spreading centres

The sliding door at the back of the bin must first be set to the required sowing rate. With the floor chain speed controlled by the speed of the wheels, the rate is always constant at a given back door setting.

The door settings on the chart are a guide only - all types of manure flow differently and we always recommend spreading the first load into a measured paddock to check the rates carefully. The spreader rate charts printed in this manual are more complete than the chart on the back of the topdresser showing a rate for a wider selection of fertilisers. The spread rates (door settings) are usually very similar for fertilisers of the same density and granule type. Density is measured in tonnes per cubic metre and can vary from N.Z. Urea @ .77 Tonnes per Cubic Metre to Lime @ 1.6 T per Cubic M. We have also included on the chart a selection of BOP Fertilisers with their densities.

Spreading centres are the second important factor to take into account when spreading fertiliser. We suggest on the chart on the back of the bin spreading at 15 metre centres for granulated fert and 10 metres for powdered of very fine granules like lime. We have also shown on our detailed chart spread widths of 12.5 metres. With more expensive high analysis products it is sometimes a good option to select a closer spacing with a lower door setting.

Keep to spreading centres to distances suggested on the rate charts



We suggest 15 m centres for the twin spinner with granulated product (super urea etc.)  
10 m for fine or powdered products (Lime).

The 2.75T Single Axle Twin Spinner bin holds approximately 2.15 cubic m of fert

= 2.6 Tonne super @ 1.2t/m density, 3.50 Tonne lime @ 1.6t /m density. 1.7 Tonne urea @ .8t/m density

The 3.25T Tandem Axle Twin Spinner bin holds approximately 2.5 cubic m of fert

= 3.00 Tonne super @ 1.2t/m density, 4.00 Tonne lime @ 1.6t /m density. 2 Tonne urea @ .8t/m density

The 4.75T Tandem Axle Twin Spinner bin holds approximately 3.9 cubic m of fert

= 4.75 Tonne super @ 1.2t/m density, 6.25 Tonne lime @ 1.6t /m density. 3 Tonne urea @ .8t/m density

(Australian Models) 2.0 Tonne Bin holds 1.68 cubic metres = 2 t super = 2.7 t lime = 1.4 t urea

3.0 Tonne Bin holds 2.53 cubic metres = 3 t super = 4.0 t lime = 2.0 t urea

### Hydraulics

The standard SAM Topdresser is fitted with a hydraulic motor (OMP32) requiring a minimum external oil flow of 35 litres per minute at 2000 psi. Any oil flow greater than 35 lit is automatically bypassed back to the tractor through the built in flow control valve (bolted to the hydraulic motor). If the tractor external hydraulics has a flow of between 24 litre and 34 litre, we can supply an alternate motor (OMP25)

Coupling the Hydraulics The feed conveyor has an in out clutch (incorporating a ram) that is activated automatically from the tractor seat when the hydraulic spinners are started.

The hydraulic twin spinner and the hydraulic poultry spinner must be coupled correctly to the tractor hydraulics system. Contact either your local agent or the manufacturer if there is any doubt. The **live** hose must be coupled to a high pressure outlet point on the tractors external system. This take off point can be fitted to an existing double acting valve already fitted for loaders, feedwagons, rams etc or a new fitting can be installed. The adjustable flow control valve on the hydraulic motor valve block controls the spinner speed. This is preset in the factory.

(Danfoss OMP32 motor = wind in then 2 1/4 turns out for 950 RPM)

(Danfoss OMP25 motor = wind in then 1 3/4 turns out for 950 RPM)

The return hose with yellow tape should be coupled directly into the tractors **hydraulic tank** using the quick release coupling supplied. It **must not** be connected through a cylinder spool or double acting valve where back pressure can build up in the neutral position. The neutral lever position must allow a free passage for the oil returning into the tractor hydraulic tank. Some tractors offer a neutral float position on the hydraulic lever which is quite satisfactory. If the floor mat remains in gear when the hydraulic lever is moved to the neutral position the return line is hooked up incorrectly. If the shaft seal on the hydraulic motor blows, it is connected incorrectly.



MOTOR SIZE	25cc	32cc
ADJUSTMENT FROM IN OR CLOSED	RPM ON SPINNERS	RPM ON SPINNERS
1 TURN	600	
1 1/4 TURN	735	610
1 1/2 TURN	855	720
1 3/4 TURN	980	815
2 TURN	1085	900
2 1/4 TURN		985
2 1/2 TURN		1065

If coupling hydraulics to a **John Deere tractor** (30,40, or 50 series) return oil into return plug into back tank and ensure the oil in the live hose is restricted with a needle valve, to a flow less than the charge pump capacity; or return oil into the filter bowl with check valve in the return line. On late model John Deere tractors with built in flow controls, leave the topdressers flow control valve (Black Knob) on the topdresser motor set as per the chart above, and then adjust the tractors built in flow control (from fully open turn slowly to decrease the oil flow) down until the spinners start to decrease speed. Open tractor flow control very slightly until spinners resume normal 950 rpm and leave set in this position. Mark position if necessary. **Check with Coombridge & Alexander Ltd if unsure.** Always ensure tractor oils are kept in top condition. Beware when changing machine from one tractor to another unless they use the same hydraulic oils (pump oil out of hoses into a tin). If the hydraulic system is coupled correctly when new it will return excellent results. Beware of the traps and always consult an expert if in doubt.

**General Safe Use** of a SAM topdresser involves following several safe work practices (also listed in this handbook in the machinery risk assessment page) including:

- !!! TURN OFF TRACTOR BEFORE REMOVING GUARDS OR SERVICING !!!**
- !!! READ ALL WARNING LABELS ON THE MACHINE !!!**
- !!! NEVER USE YOUR HANDS TO CHECK FOR OIL LEAKS !!!**
- !!! STAY AT LEAST 15 METERS CLEAR OF THE SPINNERS WHEN OPERATING !!!**
- !!! DON'T RIDE ON THE TOPDRESSER !!!**
- !!! DON'T USE THE MACHINE IN STEEP AREAS WHERE THERE IS A RISK TO THE OPERATOR OF A ROLLOVER OCCURRING !!!**

#### **General Maintenance**

1. Vee belts (above the spinners) must be kept tight. Tension by tightening the 20 mm nylock nut on the outside face of the belt mount.
2. All roller chains should be kept well oiled especially when the machine is placed in storage for any period of time.
3. Tyre pressure for the 11.5 x 15.3 tyres should be between 35-45 p.s.i.
4. After initial 10 hours use check all bolts are tight, including the wheel nuts.
5. **Grease every five hours** all nipples in the 8 cast deadeyes and the four high speed spinner bearings. Don't spare the grease gun.
6. **Grease every ten hours** all nipples and grease points on front floor adjuster slides, front screw jack, clutch pivot pin and side plates, jockey wheel, back door screw jack has two grease positions, all hubs, and nipples on the pivot points on tandem axles
7. Floor conveyor tension to be an even curve from front to rear with 40mm sag below the chassis.
8. To guard against corrosive effects of fertilisers, apply used oil mixed with a little diesel around the spinners and deflector plates. Not onto the floor mat and rubber skirts.
9. Check the hydraulic system before each use for signs of leaks or wear. To locate small leaks, use a small piece of cardboard paper or wood. **!!! NEVER USE YOUR HANDS !!!**

Good maintenance along the lines already mentioned will keep your machine in top working order for years to come. Always ensure the mesh grill inside the bin remains in place for all sowing rates below 1/2 ton to the acre. If the mesh grill is left out and rocks catch between the back door and the floor mat serious damage can occur. The Machines guarantee is invalid if mesh screen is not used.

**Coombridge & Alexander Ltd. Tel. Parts and Service 00-64-7-8478492**

#### ***The next instructions are for double acting clutch ram models only.***

*If it is impossible to find a free flow return into the tractor hydraulic system ( some tractors run a pressurised tank return) then the manufactures can fit a double acting clutch ram in place of the single acting ram on the topdresser. With a double acting ram fitted, there will be two hoses from the motor to the clutch ram. If your machine has only one hose to the clutch ram, then this is not the correct operators information for you.*

**The live hose (red end) must** be coupled to a high pressure outlet point on the tractors external system. This take off point can be fitted to an existing double acting valve already fitted for loaders, feedwagons, rams etc or a new fitting can be installed.

**The return hose (yellow end) must** be coupled into the same double acting bank using the quick release coupling supplied. To operate clutch follow the instructions on the shaded label on the front of the machine



# HEALTH & SAFETY MACHINERY RISK ASSESSMENT



## SAM Tractor Drawn Bulk Topdressers



A hazard identification, risk assessment and risk control procedure has been carried out on a representative example of a SAM topdresser and where found necessary the appropriate risk control measures have been incorporated in the product specifications. The operators manual contains the necessary information, and safety warnings are applied to the machine where necessary.

**What is a hazard?** A hazard is any situation that may cause injury or illness.

<b>Risk Assessment Rating</b> : Measures the probable frequency of an accident against the potential severity.					
		<b>Severity Potential</b>			
		Fatality	Major injury	Minor injury	Negligible Injury
		4	3	2	1
Very Likely	4	16	12	8	4
Likely	3	12	9	6	3
Unlikely	2	8	6	4	2
Highly Unlikely	1	4	3	2	1
<b>Probable Frequency</b>					

<b>Hazard:</b>	<b>Potential Risk Source:</b>	<b>Fre</b>	<b>Sev</b>	<b>Rating</b>	<b>Safety Measure:</b>
Damage to limbs crushing, abrasions	Moving Chains, Moving Gears.	1	2	2	Warning labels / Instruction Book / Guards Gears and chains can only move with machine in motion
Entanglement, drawing in, trapping	Moving Vee Belts	1	2	2	Warning labels / Instruction Book / Guards
Damage to fingers / eyes through high pressure fluid ejection	Hydraulic Oil Pressure Leaks	2	2	4	Warning in Instruction Book / Adequate pressure ratings for all components
Instability under varying conditions	Machine Roll Over	2	4	8	Warning in Instruction Book/ Adequate weight on hitch /Adequate wheel track
Slipping tripping or falling	Riding on Machine	2	2	4	Warning in Instruction Book
Damage to fingers / eyes through ejection of material	Rotating Spinner discs	1	1	1	Warning in Instruction Book / Pipe frame around discs / Rotation direction
Stopping requirements	Using too small a tractor to tow spreader	3	3	9	Aggregate Trailer Mass ( ATM) should not be more than : 1.5 x Tractor Mass (4WD); 1.0 x Tractor Mass (2WD). See Instruction Book
All the above hazards	Lack of information				Operators manual with safety and operating information



## Spread Rates

The spread rate chart (actual size) is fixed beside the back door of the topdresser. The operator only has to select the rate per hectare from the white boxes for the type of fertiliser being spread (on this chart either Lime Super or Urea) and set the top of the back door level with the selected box. The side scale 1- 20 represents centimetres open of the door. A more detailed Spread chart is included in the Operators Manual.

Door Height	Lime 10m Centres	Super 15m Centres	Urea 15m Centres	Door Height
	Density 1.6 t/cu.m	Density 1.1 t/cu.m	Density .77 t/cu.m	
20	3350	1374	905	20
19	3183	1305	860	19
18	3015	1236	815	18
17	2848	1168	769	17
16	2680	1099	724	16
15	2513	1030	679	15
14	2345	962	634	14
13	2178	893	588	13
12	2010	824	543	12
11	1843	756	498	11
10	1675	687	453	10
9	1508	618	407	9
8	1340	550	362	8
7	1173	481	317	7
6	1005	412	272	6
5	838	343	226	5
4	670	275	181	4
3	503	206	136	3
2	335	137	91	2
1	168	69	45	1
Door Height	Lime 10m Centres	Super 15m Centres	Urea 15m Centres	Door Height

## Spreading Tables

Set top of door to centre of box with rate required. All rates in KG per Hectare

More Detailed Spread Tables in the Instruction Book



## Spread Widths In Melres Center to Center

## Spread Widths In Metres Center to Center

## Check Fertiliser Densities with Manufacturer

[illegible]

Step 1. Select the product to be spread at the top of the chart e.g. Superphosphate with a density of 1.1 tonnes per cubic metre

Step 2: Select the spread width for the product either 10, 12.5, or 15 metre centers e.g. 15 metre centers

**Step 3.** Follow this column down to select spreading rate required in kilograms per hectare e.g. 343 kg/h

**Step 4.** Now Follow row across to find door height setting on left or right columns e.g. no. 5 Set door height

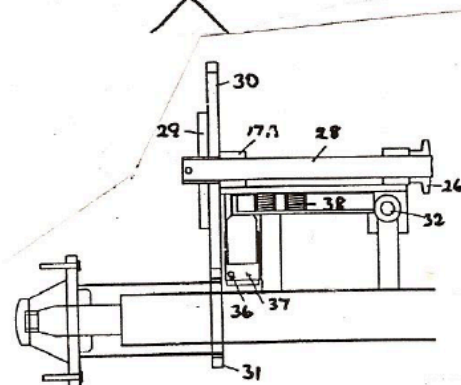
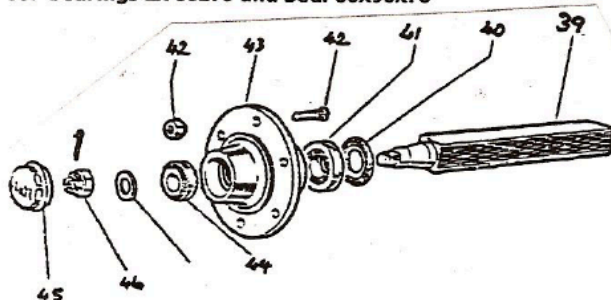
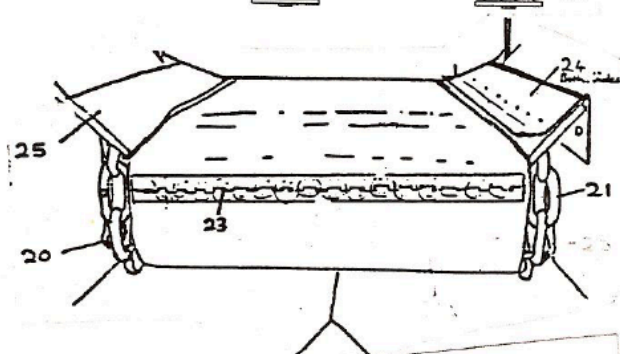
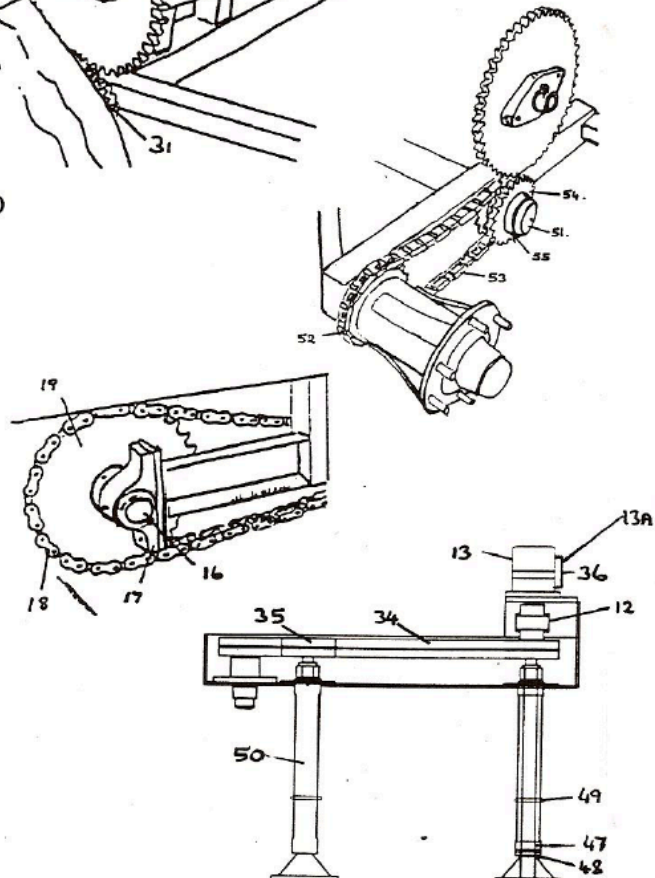
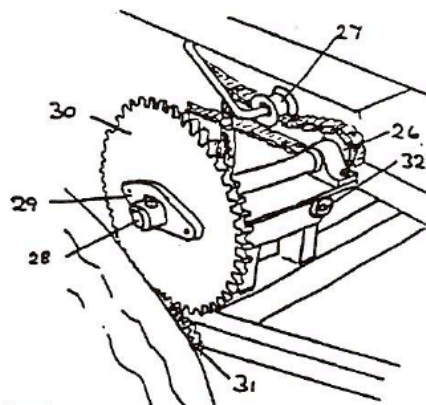


## PARTS LIST SAM TOPDRESSES

- Tyre (Check size on tyre)
- Wheel (Check size on tyre)
- Disc 20" & plate & vanes
- Back Door & Screw Jack.
- Set of Labels (4)
- Rate chart label
- Draw bar Towing Eye
- Live & Return 1/2" Hoses
- Front 1 1/2" Shaft
- 12. Flexi coupling. (check motor type)
- 13. Hydraulic motor (check the make)
- 16. 1 1/2" Back Shaft 1 Key
- 17. 1 1/2" Deadeye Bearing (7 per machine)
- 18. 1" pitch chain (Single axle 38 outer links & joiner)
- 18a. 1" pitch chain (Tandem axle 46 outer links & joiner)
- 19. 1" pitch 30 tooth sprocket - 1 1/2" Bore & Key
- 20. 5 tooth floor sprocket
- 21. Complete double chain (floor) & slats & belt
- 23. Stainless joiner
- 24. Stainless Rivets & Washer (to fix skirts in place)
- 25. 80mm x 10mm Rubber skirt (check length)
- 26. 11 Tooth 1" Pitch Sprocket - 1 1/2" Bore
- 27. Roller
- 27a. Tension spring
- 28. 1 1/2" Side Shaft (check length)
- 29. Shear Plate Assembly (1-3/4 x 1/4" H.T Bolts)
- 29a. Shear Plate Assembly (1-3/4 x 3/16" Gutter Bolt)
- 30. 48 Tooth Gear
- 31. 22 Tooth Gear
- 32. Pin 1"
- 34. BB 68 Vee Belt x 2
- 35. 112A Bilocks Complete
- 36. No. 26 Hose to Clutch Ram
- 37. Clutch Ram
- 38. 1 1/4" Compression Springs x 2
- 39. Stub Axle
- 40. Seal (either 60\*100\*10, 65\*100\*10, 70\*100\*10.)
- 41. Inner Bearing 30211
- 42. Stud & Nut 18mm
- 43. Hub casting
- 44. Outer Bearing 30208
- 45. Hubcap (fad)
- 46. Castle Nut 36mm
- 47. Bearing 67048/010
- 48. Seal TC 150 23337 (PR6521)
- 49. U Bolt
- 50. Spinner Tube Assembly Complete (long & short shaft)

### Parts on Tandem Only

- 51. Hubcap 90mm
- 52. 14 Tooth Sprocket 5" bore
- 53. Chain CA550 (16 outer links+crank+joiner)
- 54. 12t Sprocket & 22 Tooth Gear assembly
- 55. Bearings 2x 30210 and Seal 60x90x10





## Questions Often asked:

**Question :** *What rates will the machine spread at ?*

**Answer :** From 45 Kg per Ht @ 15 m Centres for urea etc up to 2500 Kg per Ht @ 10 m centres for lime

**Question :** *How even is the spread ?*

**Answer :** Representative machines have been tested using the recognised spread mark test for spreader accuracy. Spread patterns are rated using the term Coefficient of Variation, a measure of the % of fertiliser outside a perfect spread with 0% being perfect. New Zealand Standards recognise a CV under 15% as Being acceptable for nitrogenous fertilisers (DAP urea nitroposka blue etc.), and under 25% for other products (super lime etc.) The SAM Spinners have been tested at 10.8% CV with urea and 15% CV with super well within the standards.

**Question :** *What is the capacity of the machine ?*

**Answer :** The 2.75T Single Axle Twin Spinner bin holds approximately 2.15 cubic m of fert.  
= 2.6 Tonne super @ 1.2 t/m density, = 3.50 Tonne lime @ 1.6 t/m density.

= 1.7 Tonne urea @ .8t/m density

The 3.25T Tandem Axle Twin Spinner bin holds approximately 2.5 cubic m of fert  
= 3.00 Tonne super @ 1.2 t/m density, = 4.00 Tonne lime @ 1.6t /m density.

= 2 Tonne urea @ .8 t/m density

The 4.75T Tandem Axle Twin Spinner bin holds approximately 3.9 cubic m of fert.

= 4.75 Tonne super @ 1.2t/m density, = 6.25 Tonne lime @ 1.1t/m density.

= 3 Tonne urea @ .8t/m density

(Australian Models) 2.0 Tonne Bin holds 1.68 cubic metres = 2 t super = 2.7 t lime = 1.4 t urea  
3.0 Tonne Bin holds 2.53 cubic metres = 3 t super = 4.0 t lime = 2.0 t urea

**Question :** *How does the automatic clutch work ?*

**Answer :** As the hydraulic spinners are started (pressurised) oil also opens a hydraulic ram inside the clutch assembly which engages the two gears to start the floor mat. When the spinners are stopped, the two gears are automatically disengaged stopping the floor mat. The system works perfectly engaging and disengaging on the move.

**Question :** *What is the expected life of the gears ?*

**Answer :** As they are only engaging at low pressure they will last for many thousands of tonnes

**Question :** *What oil flow is required ?*

**Answer :** The standard SAM Topdresser is fitted with a hydraulic motor (OMP32) requiring a minimum external oil flow of 35 litres per minute at 2000 psi. Any oil flow greater than 35 lit is automatically bypassed back to the tractor through the built in flow control valve (bolted to the hydraulic motor). If the tractor external hydraulics has a flow of between 24 litre and 34 litre we can supply an alternate motor (OMP25).

**Question :** *What paint treatment does the machine receive ?*

**Answer :** Chassis - Blast to Sa 2.5 Paint Devshield 236 (2 pot) Paint E Line 929 (2 pot)  
Bin - Blast to Sa 2.5 Paint cathacoat zinc 232 then as above.

**Question :** *How tight should I have the floor chain / mat assembly ?*

**Answer :** The chain should return 40mm below the chassis.

**Question :** *Are there different tyre options ?*

**Answer :** Yes the standard tyres are 11.5 \* 80 \* 15.3 \* 12ply but other sizes both wider and larger in diameter are available

**Question :** *Are the spinners spinning in the correct direction ?*

**Answer :** Looking down on the disks from a position behind the machine, the right hand disk should be turning anti clockwise with the left disk turning clockwise.

## Trouble Shooting

**Question :** Why is the clutch staying in gear with the tractors hydraulic lever in neutral.

1. Either the return hose is not returning the oil directly to the tank of the tractor see operators manual. There must be no back pressure in the return line.
2. There could be a blockage in the inlet pinhole on the hydraulic ram. Remove the ram, pull out the spear and clean.
3. Check that the pivot point on the clutch is moving freely and is well greased.