Department of Primary Industries and Regional Development
GOVERNMENT OF WESTERN AUSTRALIA

Journal of the Department of Agriculture, Western Australia, Series 3

Volume 7
Number 3 *May-June, 1958*

Article 5

3-1958

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K. Fitzgerald

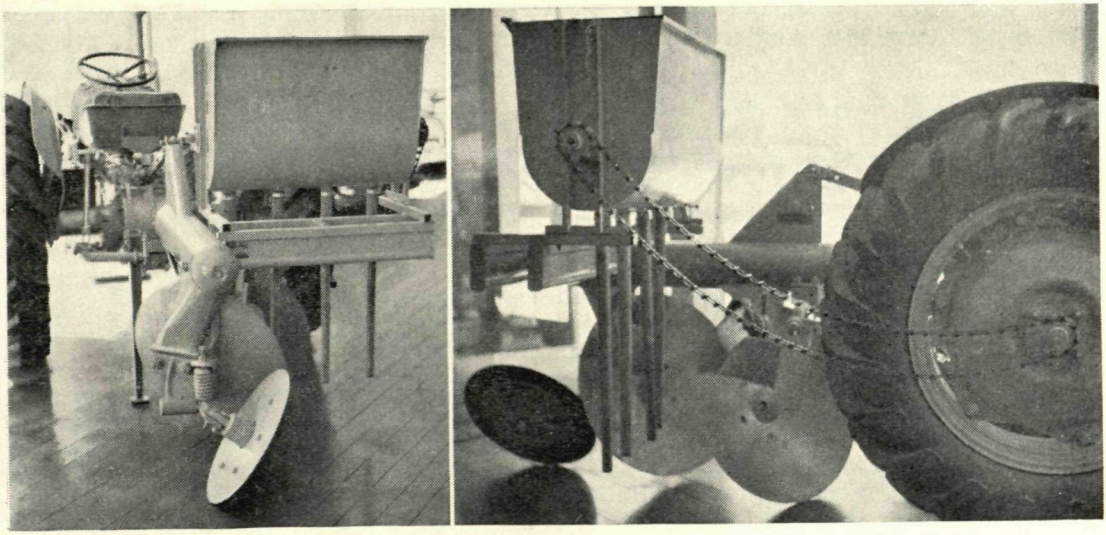


Fig. 1.—Two views of the seed-box attached to a Ferguson tractor with two-furrow disc plough

A SEED-BOX FOR SOWING BUFFEL AND BIRDWOOD GRASS SEED

By K. FITZGERALD, B.Sc. (Agric.), Adviser, North-West Branch

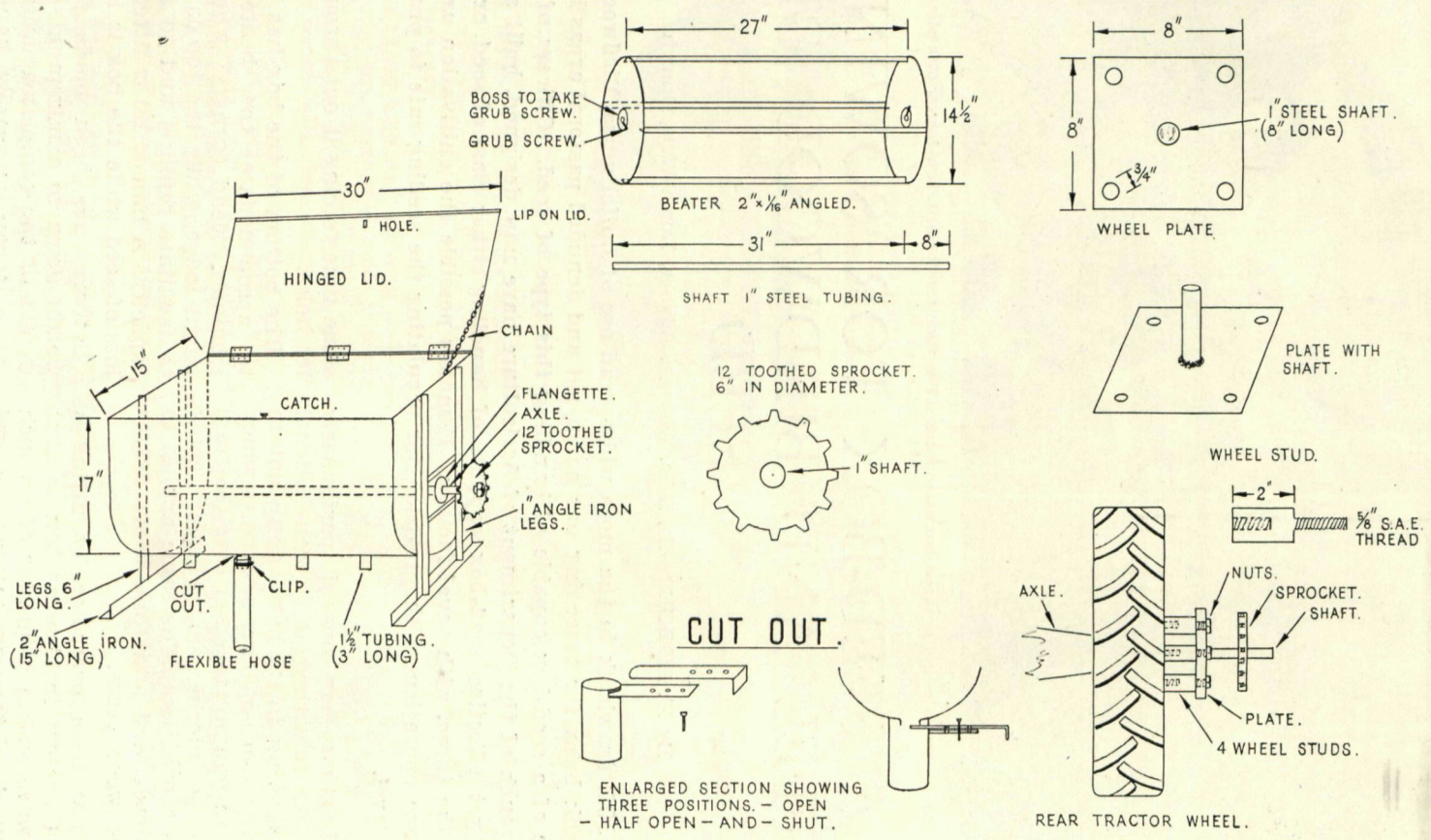
A MAJOR drawback to the more widespread use of Buffel grass, Birdwood grass and Kapok bush for reseeding our eaten-out and denuded pastoral areas has been the absence of a seed-box capable of handling this type of seed. Officers of the North-West Branch of the Department of Agriculture have now designed, built and tested a simple yet effective seed-box capable of handling either class of seed, or a combination of the three, with equal facility. It makes possible the cultivation and reseeding in the one operation, with provision for regulating the seeding rate to practically any desired level.

Buffel grass has proved particularly difficult to sow through a conventional seed-box owing to its light, fluffy nature and the presence of hairs or bristles which cause it to "clump" together over the stars or feeding mechanism without going through the outlets. The same applies to Kapok bush seed and to a lesser degree with Birdwood grass.

This has been overcome by fitting a series of beaters inside the box so that they revolve within a quarter of an inch of the inside of the box, keeping the seed agitated to prevent "clumping" and at the same time forcing it out through the outlet holes.

The bottom of the box has been curved to accommodate the beaters and to eliminate "dead corners" where the seed might lodge, while the top is rectangular to facilitate refilling and to increase the capacity. A hinged lid is fitted to prevent loss of seed while the box is in operation.

Efforts have been made to keep the weight down to a minimum. The overall weight of the completed unit is about 90 lb. so it can be readily handled by one man.


SEED. BOX.
30"
HOLE.
LIP ON LID.
HINGED LID.
CHAIN
15"
CATCH.
FLANGETTE.
AXLE.
12 TOOTHED SPROCKET.
17"
1" ANGLE IRON LEGS.
LEGS 6" LONG.
CUT OUT.
CLIP.
2" ANGLE IRON. (15" LONG)
FLEXIBLE HOSE
1½" TUBING. (3" LONG)
BEATER UNIT.
27"
BOSS TO TAKE GRUB SCREW.
GRUB SCREW.
14½"
BEATER 2"x⅛" ANGLED.
31"
8"
SHAFT 1" STEEL TUBING.
12 TOOTHED SPROCKET. 6" IN DIAMETER.
1" SHAFT.
CUT OUT.
ENLARGED SECTION SHOWING THREE POSITIONS. – OPEN – HALF OPEN – AND – SHUT.
WHEEL ATTACHMENT.
8"
8"
1" STEEL SHAFT. (8" LONG)
1¾"
WHEEL PLATE.
PLATE WITH SHAFT.
WHEEL STUD.
2"
⅝" S.A.E. THREAD
AXLE.
NUTS.
SPROCKET.
SHAFT.
PLATE.
4 WHEEL STUDS.
REAR TRACTOR WHEEL.

Sixteen-gauge flat galvanised iron was used in the construction of the box; this gives ample strenth with light weight. Box dimensions are as follows:—

	in.
Overall length	30
Height—without legs	17
Width	15

The lid is hinged at the two rear corners and with a half-inch lip at the front edge makes a snug fit. A thumbscrew catch is provided to secure the lid.

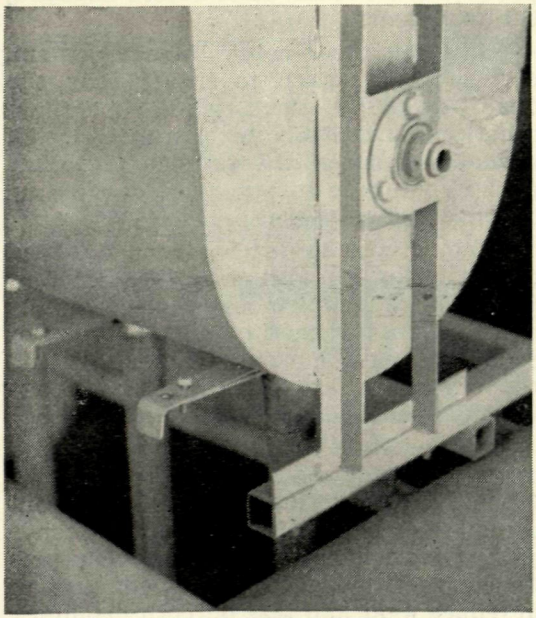


Fig. 2.—Showing cut-off attachment

Strength with lightness has also been the keynote in the construction of the beaters. The shaft or axle is of 1 in. steel tubing while the beaters are of 16-gauge plate 2 inches wide and angled for strength. The four beaters are welded at both ends to flat discs which are in turn attached to the shaft by mean of grub-screws. With this set-up it is easy to take the beater system apart if required. The overall length of the beater unit is 27 in.

The beater unit runs in pre-packed, self-aligning bearings or flangettes. These are particularly useful under dusty conditions and where rough ground would throw added strain on the beater shaft and bearings. They also eliminate the need for grease nipples which can be a nuisance with light seed such as Buffel grass.

The flangettes, which carry the beaters, are bolted externally to two pieces of 1 in. angle-iron welded to the end of the box for added strength and stability, in addition to serving as the legs of the unit. To complete the set-up, a short length of 1½ in. angle-iron is fitted at either end to the legs of the box; a series of holes have been drilled along this so that the box can be attached to practically any type of tractor-drawn or tractor-operated implement.

Outlet holes have been drilled along the middle line of the bottom of the box. Normally four half-inch or five-eighths-inch holes will be adequate but both the number and size can be varied at will. With half-inch holes and a four-bladed beater the seeding rate with mixed Buffel, Birdwood and Kapok seed has been calculated at about five seeds per inch or roughly 1 lb. seed per mile of furrow. This is with the cut-offs adjusted to leave all four holes fully open. Where clean Birdwood seed is used it would be wasteful to have all holes fully open.

Short lengths of 1½ in. steel tubing have been welded over the outlet holes. This makes possible the fitting of rubber or flexible hoses to carry the seed down close to the ground so as to reduce the tendency for the seed to be blown away from the furrows under windy conditions. The steel tubing has been slotted at the top to accommodate a cut-off device by which the seeding rate can be regulated. Only three positions have been provided in the prototype—fully open—half open—fully closed, but, by drilling extra holes a wider range could be obtained.

When used in conjunction with the cut-out device the flexible hoses make possible a wide range of row spacings.

The seed-box is chain-driven with a sprocket on the shaft of the beaters and another attached to the rear tractor wheel. Ordinary No. 52 agricultural chain works quite well and is easy to fit and adjust. The rear wheel attachment is simple: a piece of flat steel plate ½ in. thick and about 8 in. square has a piece of 1 in. steel tubing welded to its centre;

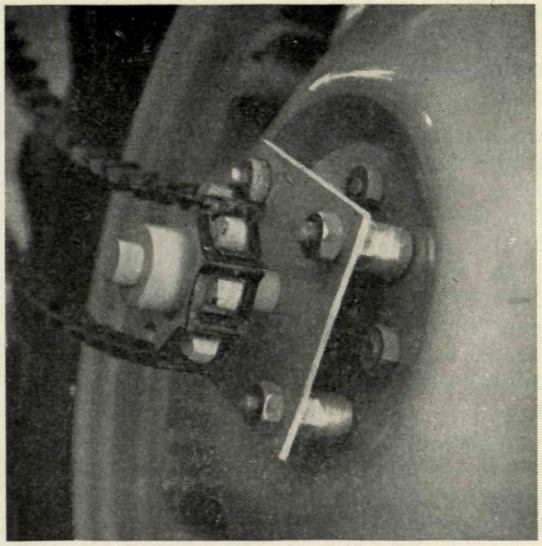


Fig. 3.—Showing method of attaching drive sprocket to rear wheel of tractor

this tubing serves as an axle to carry the driving sprocket and need only be 8 in. long. Four $\frac{3}{4}$ in. holes are drilled in the steel plate to coincide with four of the tractor wheel studs and after fitting 2 in. extension nuts to the studs the plate is slipped over the studs and secured with the wheel nuts. The plate then operates as an integral part of the tractor.

A range of sprockets is available for fitting on to either the tractor wheel or the seeder making possible further regulation of the seeding rate. The demonstration model has a one-to-one drive, using a 12-toothed sprocket.

As mentioned earlier, the cultivation and reseeding may be done in the one operation by attaching the seeder to any desired implement. A suitable attachment has been made for the disc plough but fittings for other implements are easily made.

Best results are obtained by positioning the seeder above the implement so that the seed falls on to broken ground and is covered lightly. It is inadvisable to have the seed covered to a greater depth than one inch.

This seed-box has been particularly successful when used in conjunction with a three-point linkage and hydraulic system where the machine can be lifted out of the ground when the going gets too rough. Road transport is also facilitated, although in this case it is advisable to remove the chain drive before engaging the road gear.

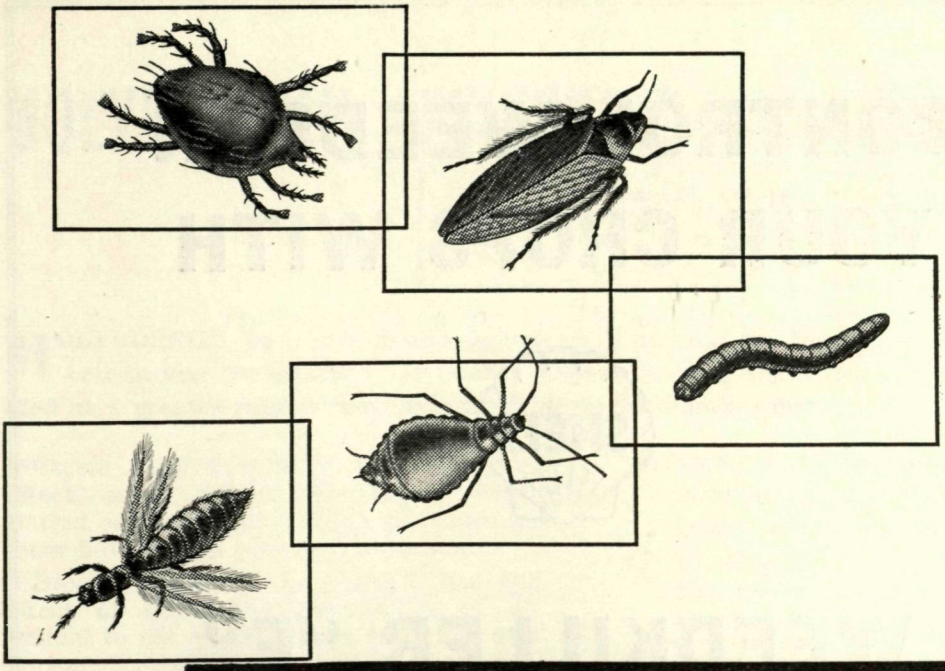
With the three-point linkage system, care must be taken to ensure that the chain is fairly slack when operating, otherwise it is likely to break or stretch when lifted out of the ground. A "jockey pulley" has been incorporated to take up the slack when operating.

Although the seeder has been designed primarily for use with tractor-operated or tractor-drawn implements it could readily be fitted on the back of a jeep, truck or even a spring-cart. The drive then would be very similar to the old-time rabbit-poisoning cart.

Box capacity is about 15 lb. of clean seed or sufficient for about 15 miles of furrows. In terms of working time this is about three and a half to four hours, as second-gear operation or about 4 m.p.h. is preferred when ploughing and seeding so as to reduce wear and tear on both machines.

The use of this simple but effective seed-box could greatly increase the scope of reseeding operations in our northern pastoral areas.

The seed-box is now being manufactured commercially, and is available in Perth, at a cost of approximately £65 complete.



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