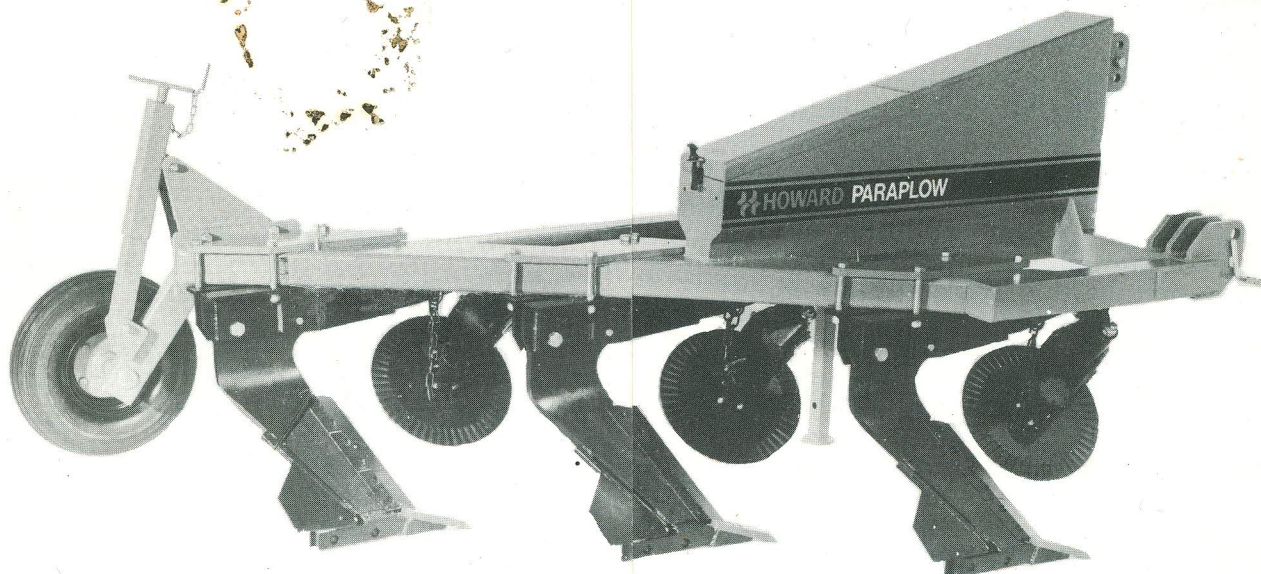


 **HOWARD**<sup>®</sup>

*Howard*  
**PARAPLOW**<sup>®</sup>



The Howard Paraplow is a new type of implement — a soil loosener. It has been developed jointly by Howard Rotavator Company and the Plant Protection Division of I.C.I. to cope with soil problems of modern, high-output farming.

With its unique, slant-legged design, the Paraplow has been developed to loosen and fracture compacted soil, providing better conditions for healthy crop development.

The Paraplow is fully adjustable to suit varying soil conditions, and is within the capability of a 80-105 h.p. tractor on most soils.

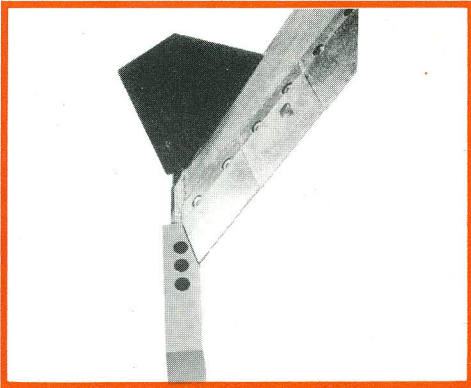
Most arable farmers are using heavier tractors and harvesting equipment. These are likely to cause increased compaction in the soil.

At the same time the tremendous increase in Direct Drilling and minimum cultivation systems has made it difficult to deal with compaction problems.

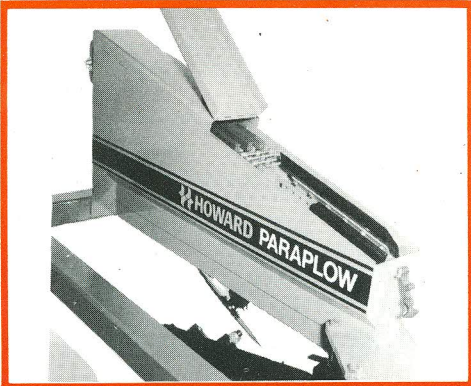
The Howard Paraplow is designed to loosen compacted soil efficiently and thoroughly, while in most cases leaving the ground surface suitable for Direct Drilling the following crop.

# A new concept in soil care

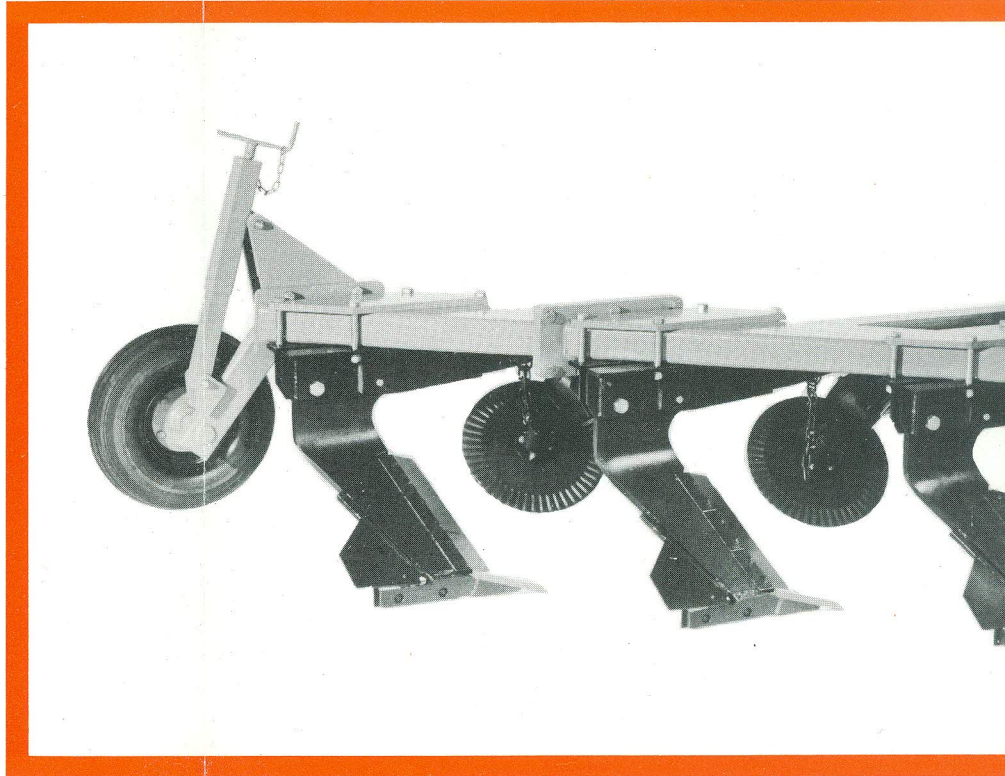
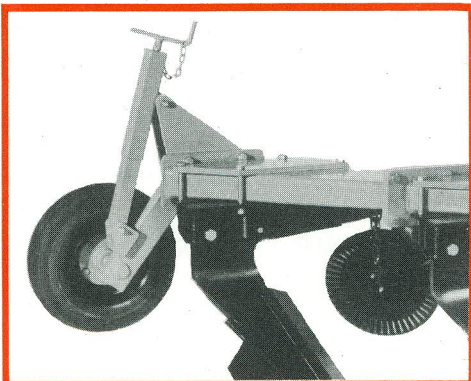
Each Paraplow leg has a rear adjustable shatterplate which gives variable controlled soil disturbance. The wearing parts (shin plates, point and landside) are easily replaceable when required.



The front headstock has a built in compartment designed to carry spare shear bolts and replaceable wearing parts.



A rubber tyred easily adjustable depth control wheel gives positive depth control. The Paraplow can be easily converted from a three legged to a four legged model by fitting the extension beam, leg and disc assembly.

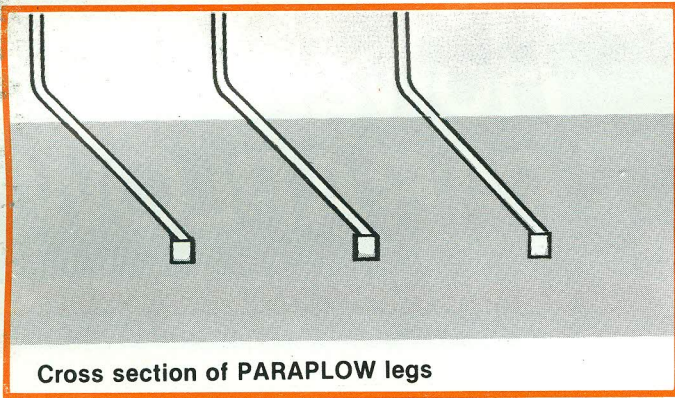


## SPECIFICATIONS

|                           | 1000 Series                   |          |
|---------------------------|-------------------------------|----------|
|                           | 3 legged                      | 4 legged |
| Overall length            | 3.4 m                         | 4.0 m    |
| Overall width             | 1.8 m                         | 2.3 m    |
| Overall height            | — 1.4 m —                     |          |
| Working width (maximum)   | 1.5 m                         | 2.0 m    |
| Working depth (maximum)   | — 35.5 cm —                   |          |
| Linkage                   | Cat II & III                  |          |
| Underbeam clearance       | — 690 mm —                    |          |
| Lift capacity requirement | 1850 kg                       | 2660 kg  |
| Disc Coulters             | — 430 mm —                    |          |
| Depth Control Wheel       | — 600x9 —<br>rubber pneumatic |          |
| Leg Protector             | Shear Bolt                    |          |
| Weight                    | 833 kg                        | 1015 kg  |
| Tractor Power required    | — 30 h.p. per Leg —           |          |

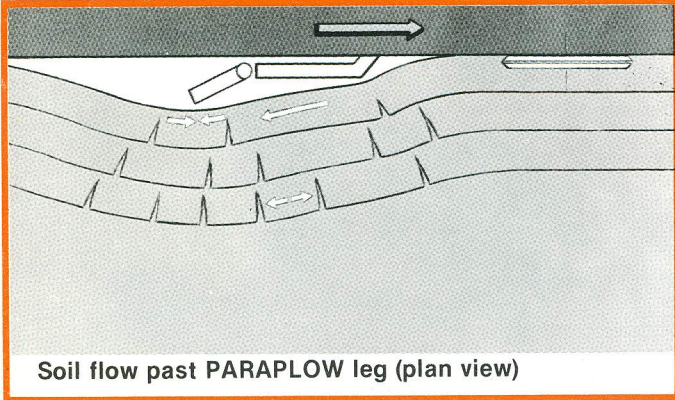
## SPECIFICATIONS

|   | 2000 Series   |            |
|---|---|------------|
|   | 6 legged  | 8 legged   |
| Overall length  | 9.5 m   | 10 m       |
| Overall width   | 3.9 m   | 4.7 m      |
| Overall height  | 1.25 m  | 1.25 m     |
| Working width (maximum)   | 3.0 m   | 4.0 m      |
| Working depth (maximum)   | — 35.5 cm —   |            |
| Linkage   | — Cat II & III —  |            |
| Underbeam clearance   | — 710 mm —  |            |
| Lift capacity requirement   | 2500 kg   | 2800 kg    |
| Disc Coulters   | — 430 mm —  |            |
| Front depth control wheel   | Multi-position fixed —<br>11.5/80 x 15 8 ply  |            |
| Leg Protector   | shear bolt  | shear bolt |
| Weight  | 3200 kg   | 3600 kg    |
| Tractor Power required  | — 30 h.p. per Leg —   |            |
| Rear depth/transport wheel  | Hydraulically operated with adjustable stop to control working depth<br>16.0/70 x 20 10 ply |            |
| The Howard 2000 Series Paraplow is semi mounted with automatic steerable frame. |   |            |



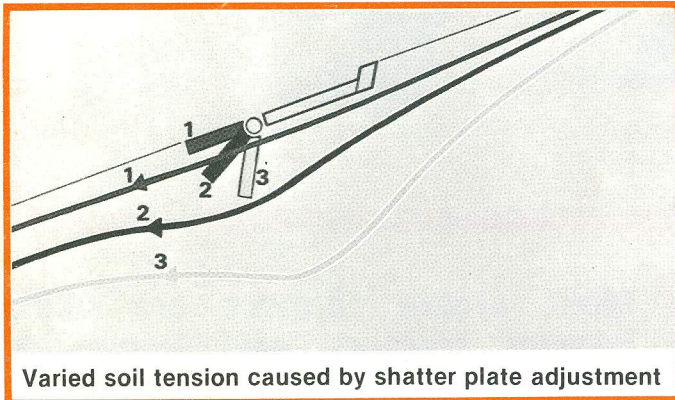
**Cross section of PARAPLOW legs**

The slant legs of the Paraplow allow the soil to pass over the legs, putting it into tension rather than compression, allowing the cracking to follow the natural fissuring of the soil.



**Soil flow past PARAPLOW leg (plan view)**

The amount of disturbance is controlled by adjusting the leg spacing and by using the rear adjustable shatter plate to vary the amount of soil fracture achieved.



**Varied soil tension caused by shatter plate adjustment**

The Howard Paraplow has been designed to deal with some of the problems which arise with modern, high-output farming methods and heavy machinery, as well as the many soils throughout the world where compacted soil layers cause surface run off and erosion.

Soil compaction can quickly become the limiting factor in crop yields. As soil density is

increased a barrier builds up to hinder healthy root development. Compaction can seriously restrict the movement of water in the soil, preventing drainage from the surface layers and limiting the availability of oxygen to the roots. Poorly drained soils are cold, less able to accept vehicle weights and more likely to encourage pest and disease problems.

The Paraplow has been developed to loosen compacted layers in the soil. The loosening action is thorough and efficient since, unlike most conventional implements, the soil passing over the legs is put into tension, rather than compression, and the cracking follows the natural fissuring of the soil. The amount of disturbance is controlled by adjusting the leg spacing and by using the rear shatter plates to vary the amount of soil fracture achieved. At the same time the slant leg design causes minimum surface disturbance so that the Paraplow can be followed in most conditions by a direct drill.

The legs of the Paraplow are designed to penetrate to a maximum of 35 cm depth (14 in). This covers the critical zone of soil depth in which compaction from previous cultivations and vehicle movement is likely.

Tests have shown that the slant leg design of the Paraplow achieves its soil-loosening action with less power than old-fashioned vertical line implements. In one independent test the drawbar effort for a slanted leg was 30% less than for a vertical tine working to the same depth in the same field. Because of this efficiency factor, the Paraplow with three or four legs is within the capacity of a 80-105 h.p. tractor in most conditions.

By controlling compaction and helping the natural processes of structure development in the soil, the Paraplow can allow increased use of Direct Drilling and reduced cultivation techniques on the more difficult clays and weakly structured loams. The Paraplow can also be used to increase production from grassland by improving drainage and loosening the compaction which builds up through intensive management.

The Howard Paraplow is a new concept in soil care which has been developed to help produce higher yields from the most efficient modern crop production systems.



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