

Soybean planters used in the improved farming system

The Improved Farming System is not a one-size-fits-all recipe, but rather the adoption of the concepts of controlled traffic, reduced tillage and the use of a fallow legume break crop to break disease cycles and reduce compaction. In some cases, modified equipment is needed and has been developed. However, in many cases existing farm machinery can be used to implement the concepts of the New Farming System.

This fact sheet looks at the soybean planters that are used in the system and considers:

1. Planter Frame design
2. Seed Metering
3. Coulters for trash management
4. Single disk opener
5. Double disk opener
6. Tyne seeders
7. Press wheels
8. Inoculum application

1. Planter frame design

Typically a soybean planter is an all seeds planter which means you have the flexibility to plant other cash-flow generating break crops such as peanuts, corn and other legumes.

When first considering the planting of soybeans into a farming system remember that you need the ability to fit any row centre spacing you have now and may change to in the future particularly if cash generating break crops are to be grown.

The ideal toolbar will allow you plant almost any row spacing, however there are limits as to how close seeding units can be relative to the next unit.

Often two rows of soybean per bed/row of sugarcane is sufficient but if three rows are desired choose your ground engaging planter units carefully.

Ideally the tool bar should be one where the units are attached by U bolts to allow for easy row adjustment. See image one.



2. Seed Metering

The seed metering of soybeans for a fallow green manure is not a precision task. Crops grown for seed will require a higher level of precision.

There are a number of different seed metering devices including an inclined plate type, vacuum type or air seeder, some of which require graphite additive to be added to the seed for trouble free operation.

Most typically a Covington Duplex®/Janke type box is sufficient - it seeds well up to 6.5 kmh and is very low maintenance with enough plate options to plant most any crop type. Typically 280 000 – 350 000 seeds are planted per hectare.

Your budget and the crop type will ultimately determine the most suitable seed metering device for your planter. In most instances all types of metering devices can be adapted to work with all types of ground engaging disks/tynes but check with the manufacturer prior to placing your order.

Always store the seeding metering devices indoors when not in use as even one season in the weather will negatively affect most seeding devices.



Image 2: Inclined plate type seeder.

3. Coulters for trash management

When a double disk opener type planter is chosen a leading coulter is also needed. The coulter cuts the trash cleanly while creating a small V into which the following double disk openers can penetrate and properly place the seed.

The fluted coulter is preferred over a plain coulter and ripple coulter. The fluted coulter will generally allow the more lightly built double disk soy seeders to penetrate a decaying trash blanket with minimal problems. Coulters are not needed for single disk type soy seeders.



Image 3:
A fluted type coulter.

4. Single disk opener

The single disk opener soybean planters are extremely robust and are well suited to direct drilling into trash blankets 4-6 weeks after harvest. They can also cope with fields that are strewn with rocks or sticks.

The better single disk planters open a slot with a disk that has angle on the vertical and horizontal plane.

Avoid seeders that only have an angle on the vertical plane of the ground engaging disk as this can lead to poor crop establishment due to inconsistent seed depth.

The single disk units often have a gauge wheel which follows the terrain so that seeding depth remains constant while a press wheel follows behind.

Benefits

- Extremely robust
- Will easily seed a decaying trash blanket
- Heavy duty parts which require low maintenance
- All Australian made (easy parts supply)
- Time and fuel saving
- Minimal trash disturbance
- Ability to plant into very wet soils

Issues

- Often no more than 2 units per row can be accommodated for those who want to plant 3 rows per bed
- Some of the single disk units position the seed unsatisfactorily while others are excellent
- Seed depth may not as consistent as the high precision double disk opener types

5. The double disk opener type

The double disk opener type seeding unit is the most commonly-used seeder type with a multitude of brands to choose from.

These units are typically high precision (combined seed meter and ground engaging unit), have electronic monitoring and can be adjusted as required.

Some units also incorporate a fertiliser metering system. If the fertiliser section is not in use it can be filled with clean sand to provide ballast to assist ground penetration.

The double disc opener type is often lightly built and would normally only be used in fields with full tillage prior to planting. The adaption to trash blanket seeding – while possible – is at the furthest extent of the designs capabilities.



Image 4: Two small discs which touch together at front.

Benefits

- Very precise seed placement
- Adjustable to accommodate different scenarios, for example slight changes in soil moisture/texture
- Low weight
- Wide range of manufacturers
- Can penetrate a decaying trash blanket if set up with a leading fluted coulter
- Minimal trash disturbance

Issues

- Not robust, should be avoided if the field has any amount of rocks or sticks
- Lightly built and annual disk bearing replacement could be necessary

6. Tyne seeders

Tyned type seeders are not suited to trash blanket seeding but are commonly used to seed into finely tilled seed beds. Tynes are a low-cost option for seeding tilled fallows and fitting three or more over a bed is achievable.



Benefits

- Low-cost
- Very good seed placement in fine tilth soil

- Have as many or as few as needed - a full set of tynes will eliminate all weeds present at time of planting as well as placing the seed.

Issues

No trash capability

7. Press wheels

Pressing of the soil over the seed to soil contact is often essential for good germination however there are some exceptions. Press wheel pressing pressure is determined by wheel assembly weight and whatever pressure increasing mechanisms are fitted to the press wheel. When seeding in trash blankets there is often good moisture so a light pressing is all that is needed.

However if the slot remains open an increase in pressure should be applied until the slot is fully closed. Excessive press wheel pressure will hinder shoot emergence. There are dual V type press wheels and single inclined press wheels, either of which will work well depending on soil conditions.



Images 5 and 6: Variations of the two types of press wheels.

8. Inoculum application

Soybeans have to be inoculated with a specific soybean inoculum (Group H). This inoculum is sensitive to light and temperature and should be stored in the fridge until use.

The bacteria can be applied to the seed as a slurry and thoroughly mixed in a cement mixer or by hand in a wheel barrow. The other option is liquid injection onto the seed as it leaves the seeding chute.

If larger areas of land are to be sown the liquid injection system will result in time savings. Dry application method could be used if seed metering system permits it however double the rate of the product is required.