

Australian inventions for sustainable farming



What is the name of the invention or new knowledge ?

Fuss' Gyrat Air Seeder – an air-based sowing machine



What did it look like ?

There is a photo of the prototype, first Gyrat air seeder in the Air Seeder History at the Gyrat website

<http://www.gyrat.com.au/AboutGyrat/AirSeederHistory/tabid/57/Default.aspx>

When was it known ?

1956
(first sold)

Who was the scientist?

Albert Fuss
farmer from Eyre Peninsula South Australia
retired at Toowoomba, on the Darling Downs, Qld.
became an agricultural machinery designer and maker

for more details about Fuss see

Quick, Graeme Ross. *Remarkable Australian Farm Machines*, 2007 Dural: Rosenberg Publishing p 49



What need was there for this?

After the sandier soils of the Eyre Peninsula, Fuss found that Queensland's Darling Downs soils had problems he hadn't had to deal with before:

- clays that crack open
- clays that erode easily
- the weight of the tractor wheels running over these clays soils moulded them into layer that dried hard

He needed a seeder that would be light weight so it could:

- sow deeply into the soil
- keep moving after rain when soils go sticky

Further, the seeder should:

- handle a variety of seeds accurately
- use a chisel implement instead of the current boxes for sowing.
- be easy to clean



For more information on the background to this invention see:
Quick, Graeme Ross. *Remarkable Australian Farm Machines*, 2007 Dural: Rosenberg Publishing p 49

The combine below left has the seeds in the boxes for sowing and is a heavier machine to go over the soil than ...



The Air Seeder above right has the seeds flow through the tubes to the ground. It is a much lighter implement over the soil, so it can be much bigger and sow directly into stubble.

Photos J. Clark 2013.



What was the discovery that led to this invention?

Air could be used to force the seeds out through tubes to drop into the ground for sowing.

The chisel plough made the furrows deep enough along the ground for the seed to drop into, then covered it over.

For more information on the background to this invention see:
Quick, Graeme Ross. *Remarkable Australian Farm Machines*, 2007 Dural: Rosenberg Publishing p 49

How does it work ?

The key points are:

- grain held in central hopper
- auger moves seed from there to a conical spinner
- pulleys set the rate of seed drop to ensure consistent and accurate distance
- seed goes from the spinner via the tubes
- air is blown through each tube to drop the seed out.

For an overview of air seeder operations see
Crocombe, Angela. *Grain Farming* 2006 Carlton: Echidna Books, Harcourt Education, p 12
Peterson, Cris. *Fantastic Farm Machines*. 2006. Honesdale, Pennsylvania: Boyd Mills Press p 9



For more information on the specific design of this invention see
Quick, Graeme Ross. Remarkable Australian Farm Machines, 2007 Dural: Rosenberg Publishing p 49



What shows its importance as an Australian discovery/invention ?

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|--|--|
| Business set up on it | Fuss set up his family company on the basis of this invention. |
| Where used on farm | in paddocks for cropping (putting the seed in) |
| Changes it made to farming | because it was so much lighter than the combines, it could be used earlier and on more types of paddocks |
| Contribution to sustainability | 1 being lighter it could be used in heavy, sticky soils to get the most benefit from the moisture that made them sticky 2 it made no-till farming possible. = ie made the farming enterprise more efficient |
| How quickly adopted | almost straight away |
| The places it spread to | across Australia then world- wide |
| Changes made to it for today | continual updating but still an essential farm implement today, See Air Seeder History for major modifications with getting bigger and more suited to no-till farming |
| Still in use today | yes |
| Current use in the Wimmera-Mallee | used by most farmers, especially, with no-till methods.  air seeder in use for 2013 cropping season. photo J. Clark 2013. |
| Led to other knowledge or invention | continual update and modifications with Gyrat and other air seeder manufacturers |





Shape Sleuths Link –

An exercise for the 2013 Maths of Planet Earth

1 From the Air Seeder History webpage at Gyral website, draw each seeder rig using the simple shapes that make up the:

- 1956 prototype Gyral Air seeder rig from the side
- 1960 Seeder rig from the back
- 1978 Seeder rig from the side
- 2013 seeder rig with tractor from the side (photo above)

2 Name the shapes that are found in your drawings above.

3 Get a box with some dry sand, and a couple of straws and some seeds or grains (rice or barley) which can fit through the straws. Try this simulation:

- Make a furrow in the sand.
- Hold a straw vertically above this and drop a seed through.
- See if you can blow a seed through the straw.
- Is there a difference in how far in to the sand they go?
- The airseeder makes the furrow as it goes, blows the seed and fertiliser into the furrow and covers the soil over the seed.
- What work does the air seeder save from being needed in the sowing of seed?

4 If you know someone with an air seeder, interview them to find out:

- What the ute is used for, and how often
- What was used before for this work
- What advantages the farmer sees his air seeder has over the combines.

For further information :

Books

Crocombe, Angela. *Grain Farming* 2006 Carlton: Echidna Books, Harcourt Education, p 12
Peterson, Cris. *Fantastic Farm Machines*. 2006. Honesdale, Pennsylvania: Boyd Mills Press p 9

Quick, Graeme Ross. *Remarkable Australian Farm Machines*, 2007 Dural: Rosenberg Publishing pp 49-53

Websites

Air Seeder History at Gyral website

<http://www.gyral.com.au/AboutGyral/AirSeederHistory/tabid/57/Default.aspx>



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