

No-till pasture establishment by Soilflow seeding

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Pasture establishment is a challenge with high cost and risk, particularly in the more arid areas of NSW and more so with the sub tropical perennial summer grasses. Establishment by no-till has many advantages and is becoming a widely recommended practice, in many cases the preferred option.

The aim has been to develop a lower risk system of no-till pasture establishment by creating a more favourable environment for germination and seedling survival.

Methods

Adequate moisture and seed placement are keys to pasture germination and survival. Effective moisture available for germination and for early seedling development is dependant on total available levels, tilth, competition, seed/soil contact and depth of sowing.

A system and a mechanism has been developed that will accurately and consistently place the seed in an environment that maximises the ability of the seed to take up moisture and have early drought tolerance through early root development (Figure 1). The system is called Soilflow Seeding Technology. This uses a tine mechanism to create tilth and then allows the soil to mostly backfill this trench with soil before the seed is placed in the flow of soil (Figure 2). Seeding depth is controlled by the exact position the seed is dropped in relation to the flow of soil. Soil flow is dependant on ground speed, soil type and soil moisture.

Initially a coulter cuts the soil and trash, a tine creates a trench or a deep zone of tilth, places fertiliser at its base and places seed from an adjustable delivery tube in a 25 mm range of soil depth. The trench is finally pressed down with a presswheel. On germination, the deep zone of moist tilth encourages early root development downwards. The fertiliser is ideally placed for plant uptake at the base of this trench. Importantly, seeding depth is not dependant on tine depth so long as the tine is in

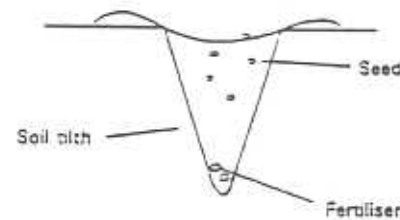


Figure 1. Seed & fertiliser placement in the soil

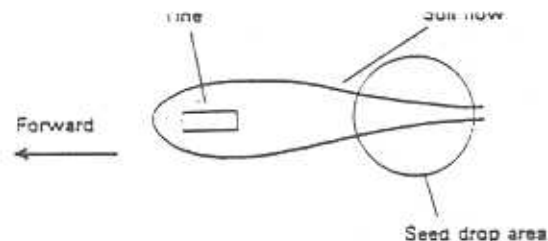


Figure 2. Soilflow seed drop

the range 50 to 125 mm. The presswheel is essential, ensuring good seed/soil contact and reducing the seed trench drying out.

Trials have been conducted for 3 years on a range of species and soil types throughout north west NSW to develop the system of Soilflow Seeding and test feasibility.

Results and Discussion

Despite the mostly dry conditions over the past 3 years the results have shown that the system works very well with good germinations on over 50% of sites. Where there was failure to germinate, this was due to factors including drought or wet conditions, early mechanism development, excessive competition or planting too deep for the species. Soil types included brown clay, euchrozem, black earth, red brown earth, yellow solodic and earthy sand. Species included temperate legumes and grasses and subtropical perennial summer grasses.