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Tropical perennial grasses – sowing time and depth

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Sow in November–December after 7–10 days of day temperatures consistently above 20°C and night temperatures above 10°C.

Sow shallow at a depth of about 10 mm (half an inch).

Although the soil surface may be dry, use a push-probe to ensure that there is at least 1 m of subsoil moisture at sowing.

Sowing after the end of January is generally not recommended since plants will be too small to withstand frosting in the subsequent autumn, winter and spring.

Research has clearly sown that the best numbers for plant establishment occur from sowings made in November–January when seeds are sown shallow at a depth of 10–25 mm. In practice, aim to sow at a depth of 10 mm to allow for paddock variation and differences in surface roughness and furrows that markedly affect the accurate placement of seed at the right sowing depth or to cover seed with the right amount of soil. Since many tropical perennial grass seeds are small, sowing deeper markedly reduces the plant establishment of most cultivars. If sowing in rows, use press wheels on soils that are not-hard setting soils to improve the soil–seed contact, which helps increase plant establishment.

The best 'sowing window' is late November to early December when day temperatures have consistently been above 20°C and night temperatures above 10°C for a period of 7−10 days. Sowing in early spring or autumn when temperatures are below these levels greatly reduces seed germination and establishment may be poor. Sowing when temperatures are high can also reduce establishment, since water losses from the soil by evaporation are high and rainfall is less effective.

Sowing in late November–early December maximises the chances of receiving sufficient summer rainfall for germination and establishment (see following table). As a guide one to two rainfall events of 20–25 mm are required.

Good tropical perennial grass establishment occurs when high quality seed is sown into a weed-free seedbed at the right depth and right time of the year.

It has been said that 'the best time to sow tropical grasses is just before two inches of rain'. This may not be as impractical as it first sounds since a high proportion of summer rainfall can occur as a result of tropical low pressure systems. In summer, these systems can build up off the north-west coast of Western Australia or coastal Queensland, taking 3−4 days to arrive in northern NSW and often delivering substantial rainfall events. Keeping a close watch on weather maps and 4−10 day forecasts may allow you to time sowings to coincide with the likelihood of these events occurring.

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Rainfall (mm)	November	December	January
		Moree	
Mean	56	58	71
Median	47	47	56
30th percentile	29	30	37
No. rain days	6	6	7
		Warialda	
Mean	69	71	85
Median	58	57	72
30th percentile	33	44	43
No. rain days	7	7	8
		Gunnedah	
Mean	60	66	72
Median	53	60	54
30th percentile	29	41	32
No. rain days	6	7	7
		Tamworth	
Mean	68	75	86
Median	64	73	74
30th percentile	41	53	47
No. rain days	7	8	7

Rainfall statistics for four locations on the North-West Slopes of NSW. The median (50th) and 30th percentile values indicate that there is a 50 and 70% chance, respectively, of monthly rainfall exceeding these amounts. Values are from Rainman Streamflow 4.3.

It is important to remember that because of high summer rainfall intensity, high temperatures and high evaporation rates, most summer rainfall events are only likely to wet the uppermost part of the soil profile. Even if establishment is good, sowing on a low subsoil moisture profile is risky and young plants may subsequently fail as they run out of water. Use winter-fallowing techniques in conjunction with pre-sowing weed control to build up subsoil moisture, and a push-probe to monitor stored water levels. Do not sow unless there is 1 m of stored subsoil moisture on most soil types.

Although temperature and/or rainfall conditions can be favourable for germination and establishment, do not sow after the end of January. Seedlings that emerge from later sowings remain small and do not flower as temperatures decline in autumn. Up to 70% can be lost because of frosty conditions in autumn, winter and spring. Frosts can occur from April to October (145–150 days of frost occurrence) and typically up to 60 frosts may occur each year.

Anecdotally, some producers believe that seed sown in one year will remain viable in the soil and come up in the next year when temperature and rainfall conditions are favourable. Tropical perennial grass seeds do not have mechanisms such as hard seeds have that allow them to survive in the soil without taking up water. In moist soil, seeds contained in either florets or seed-coats will soften and be prone to attack from insects and soil fungi and bacteria, resulting in high seed losses. In wet years, losses can be as high as 100%, in drier years some seeds may survive and subsequently germinate, but this is an unreliable and risky method of establishment. Seeds in seedheads of flowering plants, that are held in the plant and litter material above the soil, can successfully survive over winter. These seeds may produce new plants the following year. Therefore, allowing plants to flower and set seed and new seedlings to be recruited over time is one way of naturally increasing the plant density of thin stands.

Further reading

Lodge GM, Harden S (2009) Effects of depth and time of sowing and over-wintering on tropical perennial grass seedling emergence in northern New South Wales. *Crop & Pasture Science* **60**, 954-962.

Lodge GM, Brennan MA, Harden S (2010) Field studies of the effects of pre-sowing weed control and time of sowing on tropical perennial grass establishment, North-West Slopes, New South Wales. *Crop & Pasture Science* **61**, 182-191.

The department's website www.industry.nsw.gov.au contains other useful information.

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