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Digit grass seed production

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High-yielding digit grass *Digitaria eriantha* seed crops result from:

- a dense crop of highly fertile tillers;
- a compressed flowering period;
- calm weather during seed ripening; and
- a harvest timed to recover the most ripe seed.

Important steps in achieving this objective are as follows:

- Time the 'cleaning cut' to benefit from favourable growing conditions.
- Use irrigation to maximise yield potential.
- Supply sufficient nitrogen for vigorous crop development.
- Inspect the maturing crop regularly.
- Select the optimum harvest time.

ESTABLISHMENT

Details on sowing and establishment are found in Agnote DPI-430 *Digit grass – a versatile warm-season grass*. Also see Agnote DPI-156 *Successful establishment of tropical perennial grasses in North West NSW*.

Well-structured loams and clay loams are preferred for digit grass seed production. Lighter loams with good depth and structure can also be suitable. Soils should be fertile with good water-holding capacities. Rain-grown seed production can be risky, particularly in inland districts. However, it can be a profitable sideline given favourable seasonal conditions and good management. Provided the interrow area can be kept free of weeds, row spacing wider than 50 cm may be used in drier areas of inland NSW to conserve soil moisture for more reliable seed production.

FLOWERING

In the subtropical and warm temperate areas of NSW, digit grass flowers throughout the growing season. Management practices should encourage early production of tillers following the 'cleaning cut', which later helps to synchronise seed head production and flowering.

THE CLEANING CUT

Cleaning cuts can take place from mid-September to mid-February, depending on seasonal conditions and local climate. Cut the crop at a height of about 7 cm to remove existing growth and stimulate initiation of new tillers. This defoliation – called 'cleaning' – is usually achieved by a mowing. However, in western districts, a close, even grazing with cattle can be successful.

Cut when soil moisture levels are high and the prospects of continuing good growth conditions – especially over the following 3–4 weeks – are favourable. Do not cut or graze the developing crop again once heads begin to emerge.

Tillers emerging in the first 2–4 weeks after cutting have higher fertility levels than later emerging tillers. Spring crops also produce a higher proportion of fertile tillers than autumn crops.

IRRIGATION

Most NSW seed crops of digit grass have been rain-grown. Irrigation can help ensure timely management and the opportunity for higher yields. Two crops per year can be grown under irrigation. One crop is more usual under rain-grown conditions.

The most critical times for maintaining high levels of soil moisture are at the cleaning cut and just before flowering. Ideally, at the time of the cleaning cut there should be at least 50 cm of stored soil moisture. On a deep loam, up to 0.80 ML of irrigation per hectare can be applied at the cleaning cut. This irrigation also ensures that the topdressed nitrogen is washed into

the root zone, where it can be most effectively used by the plant.

Irrigation scheduling can be based on the following factors:

- a potential effective rooting depth of 50 cm, which contains 70% of the root mass;
- the daily evaporation rates;
- a crop factor of 0.75; and
- irrigating at 50% depletion of 'plant-available water' in the effective rooting depth.

FERTILISER

Adequate nitrogen fertiliser is applied at the time of the cleaning cut.

On low to medium fertility soils with good moisture supplies, seed yield responses can be obtained up to about 100 kg N/ha/crop. However, to reduce the risk of depleting soil moisture, a maximum of about 50 kg N/ha is recommended for rain-grown crops in drier inland areas. Near the optimum nitrogen rates, lodging should be minimal – and as the crop matures, the dark-green leaves should lighten to a yellowish-green colour. Too much nitrogen can result in more tillers being initiated by the ripening crop. By then they are too late to produce useful seed and only compete with the earlier, more advanced tillers.

Soil tests will help determine phosphorus, sulfur and potassium requirements. On low-sulfur-status soils, approximately 20 kg S/ha is recommended at the start of each growing season.

WEED CONTROL

Manage the digit pasture so that it is relatively free of weeds at the time of cleaning.

Broadleaf weeds that germinate after the cleaning cut can be controlled at early post-emergence with registered herbicides. Hormone-acting herbicides must be applied before the stem elongation growth stage of the crop. All hormone-acting herbicides will damage or kill most legumes.

SEED HARVEST

Premier digit grass crops take about 60–90 days from cleaning cut to harvest maturity. Maximum seed yield generally occurs 2–3 weeks after peak flowering. This interval is principally influenced by rainfall, temperature and wind speed. In a crop with a compressed flowering period, and not subject to strong winds or rain, maximum yield usually occurs when about 20% of the seed heads have begun to shed ripe seeds.

Determining the optimum time to harvest is a balance between total seed produced and seed shed. It requires close and regular observation of the crop, looking at the change in colour that may occur, and the degree of shedding.

A crop ready for harvest can be recognised by:

- the ease with which the ripe seed can be rubbed out of the heads – by hand – and by the presence of mature greyish-brown to brownish-purple kernels (caryopses) in that seed;
- a change in the overall colour of the crop from purplish-green to a lighter straw colour; and
- the stalks directly below the heads beginning to turn yellow.

Natural drying-down of the standing crop is preferred. Swathing is sometimes used with other grass crops to overcome potential losses from strong winds or rain, but it is generally not recommended for digit grass. Seed purity and germination levels from swathed crops have been inferior to direct-headed crops. This is because the high proportion of immature seed recovered makes the harvested material difficult to clean. Chemical desiccation of the crop has proven unsuccessful. The result was an accentuation of shattering losses and a poor seed sample.

Digit grass crops are direct headed with conventional combine or axial flow headers. Unless the crop is lodged, the heads are held well above the leaf canopy and should be easily harvested.

The forward speed of the header needs to be slow enough to prevent choking of the drum. Consult the harvester manufacturer's manual for settings. As a general guide, an inexperienced grower should start by:

- setting the header with a drum speed of 800 rpm;
- partly opening the concave (about 20 mm in front and 5 mm at the back); and
- using adjustable sieves (or perhaps a 6 mm bottom screen) with virtually no air blowing over them.

Empty the header bin at regular intervals during the day to prevent auger blockage.

When harvesting in windy conditions, operate the header into the wind to collect the most heads.

SEED YIELDS

Cleaned seed yields of about 300 kg/ha have been produced from irrigated stands. However, rain-grown yields of around 200 kg/ha for coastal crops and 100 kg/ha for inland crops are more usual.

SEED DRYING

Freshly harvested digit grass seed is high in moisture and must be dried promptly to avoid heating, spoilage and consequent loss of seed viability. To prevent any loss of quality, drying should begin within 2 hours of harvest and the temperature should not exceed 40°C.

Moisture content of the dried seed should be about 10% or less.

The usual drying method uses a standard bin drier in which heated or unheated air is forced through the moist seed. The drying process should be regularly monitored, and the seed turned as necessary to avoid 'hot' spots developing in the bin.

In drier inland areas, seed can be air dried naturally in shallow layers. The harvested seed is spread on tarpaulins to 200 mm depth. This should be turned every 2 hours on the first day and regularly thereafter to even out moisture and avoid 'hot' spots developing.

For example, a layer of seed 120 mm deep at Dubbo in early January required turning two to three times a day for the first few days, then twice a day until dry. The drying time can take up to 14 days in January at Dubbo. Drying time varies according to seed moisture, ambient air relative humidity and temperature, and wind speed. Often the seed is laid on the floor of a large shed. Good ventilation assists the drying process.

Digit grass seed can be cleaned on an air-screen cleaner, using a slotted top screen and a 3.2 mm round-holed bottom screen. Pre-cleaning will help maximise cleaning efficiency by screening and aspirating on an orbital cleaner. For problem seed lots, the cleaning through an air-screen machine may need to be followed by finishing through indent cylinders or on a gravity table.

Good quality commercial seed typically has seed counts of 1.7–2.5 million/kg and a germination level of 40%–70%.

Low levels of dormant seed may occur in recently harvested seed samples.

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FURTHER READING

Ramirez y Aviles, Luis. (1993) 'Effect on nitrogen supply and management on seed production of *Digitaria eriantha* Steud. Cv. Premier'. Doctor of Philosophy thesis, University of Queensland, Australia.

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