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Germination and hardseededness in *desmanthus*—by John Hopkinson and Bernie English, on pages 1-16.

Most *desmanthus* seed is hard and will not germinate as very little seed softens in the soil. Hard seed remains hard and viable for more than a year while scarified seed germinates quickly (or dies).

The hard seed coat can be ruptured at the lens, where water normally enters, by immersing seed in boiling water for 4-10 seconds or by physical pressure. Numerous minor impacts as seed is passed through a rice-whitener combines gentle scarification and rupture of the seed coat, and provides successful commercial scarification.

Dynamics of plant populations in *Heteropogon contortus* (black speargrass) pastures on a granite landscape in southern Queensland. 1. Dynamics of *H. contortus* populations—by David Orr, Col Paton and D. Reid, on pages 17-30.

Speargrass is more dense on the silver-leaf ironbark lower slopes than higher up under narrow-leaf ironbark. Neither moderate stocking pressure nor legume oversowing had much impact on the speargrass. Although heavy stocking had an effect, the drought over the trial period had most impact. Established plants died, resulting in large fluctuations in plant number and size. Regular seedling recruitment is needed for speargrass to persist. Despite the high turnover, populations remained at reasonable levels indicating that speargrass is pretty resilient.

Dynamics of plant populations in *Heteropogon contortus* (black speargrass) pastures on a granite landscape in southern Queensland. 2. Seed production and soil seed banks of *H. contortus*—by David Orr, Col Paton and C. Playford, on 31-41.

Black speargrass can produce relatively large amounts of seed depending on seasonal rainfall patterns. Over the six years of the trial, seed production in autumn ranged from 260 to 1800 seeds per square metre. It was higher in the silver-leaf ironbark land class but also affected by stocking rate. Seed production depends on inflorescence density as affected by rainfall in February while seed viability depends on March rainfall. Seed banks in spring varied from 130 to 520 seeds per square metre.

Steer gains on Verano-dominant improved pastures in north Queensland compared with those at Katherine, Northern Territory - is there a deficiency of nitrogen at Katherine? —by Ray Jones, on pages 42-46.

Over a 4-year period, steers grazing Verano-dominant pastures gained similar weight at Lansdown in N. Queensland to those at Katherine during the wet season. However, during the dry season, the steers at Katherine lost much more weight. Thus the average annual gain at Katherine was 99 kg compared with 155 kg at Lansdown. This could be because the plant crude protein levels (< 1% N in Verano leaf) at Katherine during the dry season are too low to sustain the weight of steers, even on legume-dominant pastures.

Net primary productivity and rainfall use efficiency of pastures on reconstructed land following open-cut coal mining in central Queensland, Australia—by S.A. Bisrat, Ben Mullen, A.H. Grigg and Max Shelton, on pages 47-55.

Cattle grazing on improved pastures is a logical land use following mining, but little is known of stock carrying capacity. Pasture productivity (NPP) of 3000-11000 kg/ha/yr and RUE (4-21 kg/ha/mm) of improved pastures on reconstructed land were similar to those on buffel grass pastures on unmined land. Predicted safe stocking rates for years with average rainfall ranged from 2.4 to 5.9 ha/head.

For a given amount of rainfall, pasture production is affected by slope, exchangeable sodium percentage and magnesium concentration. Slope and exchangeable sodium affect rainfall infiltration while magnesium was closely related to soil nitrogen and hence indicates soil fertility.

Variation in native cowpea for forage production in semi-arid Botswana—by Moses Karachi and B.M. Lefofe, on pages 56-61.

In 15 cowpea accessions, there were marked differences in spread, nodulation, time to flowering, and yields of forage and seed, and in nutritive quality. Accessions B052C, B108 and B366 were most promising.