

Grow your own 'Pots of Hope': assessing your pasture recovery potential.

Summary

- Seed bank viability can be assessed on property and is a great activity to involve your team.
- Mitchell grass seed is located within the top 2 centimetres of soil.
- If Mitchell grass seedlings grow in your pots, you have adequate seed reserve for your pasture to recover.

Background information

Seed bank viability testing can be a simple and enjoyable project to understand the type and quantity of viable seed that is in the landscape. This factsheet follows on from the "[Pots of Hope: Assessing pasture recovery potential through soil seed bank viability testing](#)" fact sheet on the [FutureBeef website](#).

When to collect samples

Mitchell grass seed has a dormancy of 6 – 12 months. Once tussocks have finished seeding over the wet season collect your samples any time before it rains again to make sure seed in the soil has not already started to germinate. Generally, June to August is a good time as seed has dropped off the plants, to maximise the amount of seed in the soil.

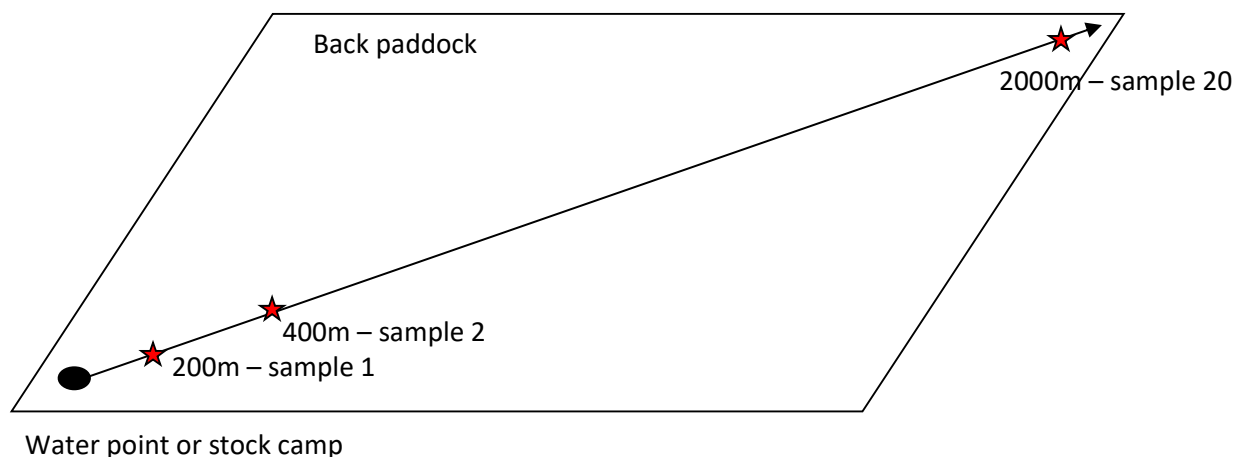
Selecting a site to sample

Choose one or two paddocks you are most concerned about. For example, the paddock with the most dead Mitchell grass tussocks, erosion or after treating paddocks heavily infested with Prickly Acacia or Parkinsonia.

Collecting the sample

Collect up to 20 samples along a straight line, starting at a watering point or stock camp and heading towards the most distant fence-line. The more samples the better, however a couple of samples will give an idea of what seed reserves are available.

Space the samples every 200 to 300 metres (depending on paddock size), starting close to the water point or stock camp. Each sample should be collected within 5-10 metres of where you stop the vehicle. Sample next to or in between Mitchell grass tussocks.



Mitchell grass seed is found in the top 2 centimetres of the soil and can be collected using a PVC corer or a square head shovel.

Collecting with a PVC corer

The corer is a 5 centimetres diameter length of PVC tube.

1. Measure 2.5 centimetres from the open end of the PVC tube. Wrap a length of red electrical tape around the PVC tube at this 2.5centimetres mark to indicate the 2.5 centimetres sample depth.
2. Push the tube 2.5 centimetres into the soil, to the base of the red tape (Picture 1).
3. Slip a BBQ flip under the PVC corer to keep the sample together as you place the soil sample into a bucket.
4. Repeat 5 times, combining the cores into the same bucket, so that you have collected 6 soil cores of 2.5 centimetres depth at each site.
5. Tip the sample into a paper bag and label bag clearly with paddock name, sample number and date.



Picture 1. Example of a PVC corer and the red electrical tape to show depth.

Collecting with a square head shovel

1. Take a shallow scrape, depending on size of shovel, about half a shovel full or 5-10 centimetres in length.
2. Place the sample in bucket.
3. Tip the sample into a paper bag and label bag clearly with paddock name, sample number and date.

Remember to take a photo of the sites where the samples have been collected.

Make a note of observations such as ground cover and weed management as well as paddock management information, stocking rate and rainfall history.

Storing Samples

The paper bags containing the samples can now be stored in either a cardboard or plastic box in a dry area away from rats and mice until it is time to grow the samples.

Growing Samples

For Mitchell grass seed to germinate there needs to be adequate moisture and soil temperature. Generally, September to October is a good time to pot up the samples and begin watering as minimum overnight temperatures have begun to increase.

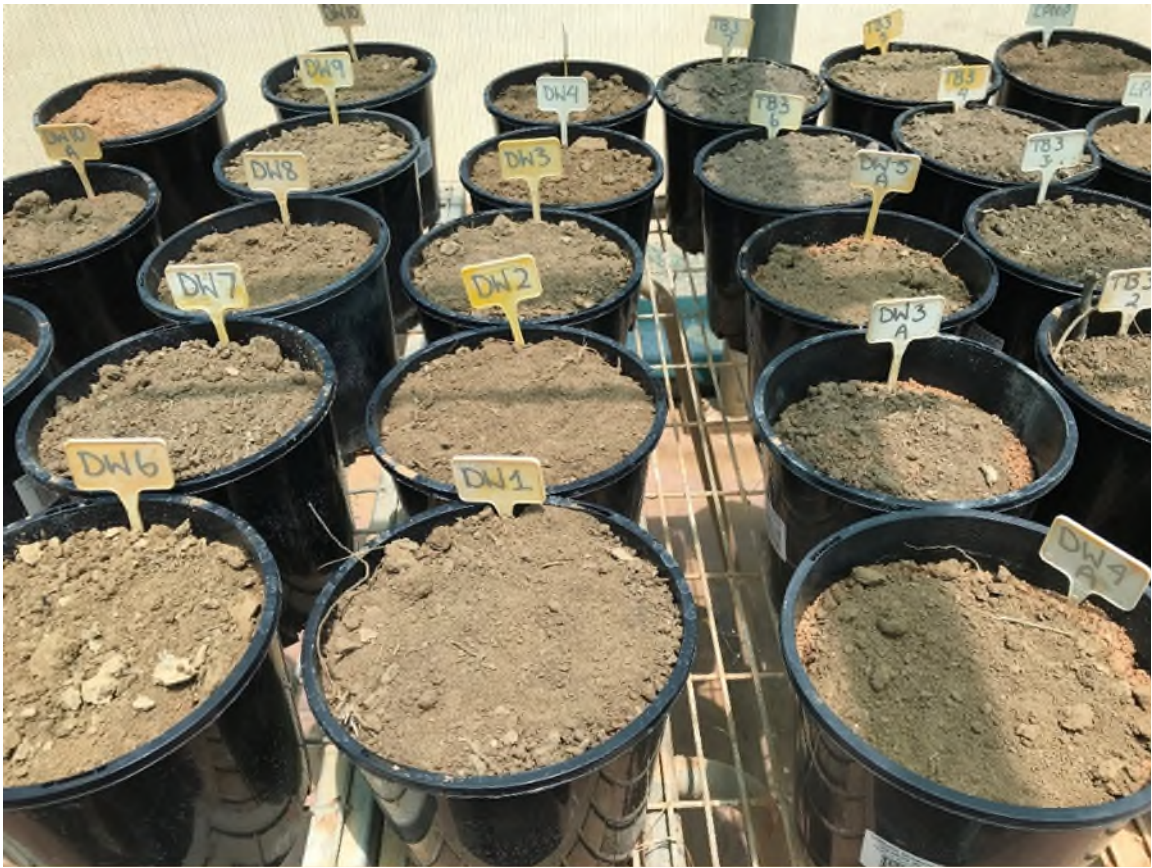
Fill the pots with non-contaminated sand or soil. Any size pot can be used, in the 'Pots of Hope' project 20-centimetres diameter pots were used. Fill the pot with sand to about 3 centimetres from the top, place each sample on top of the sand and spread it out to around 2 centimetres in depth. Make sure there is room for the roots to grow and not compromise seedling growth. Label the pots clearly with waterproof labels that include paddock name and sample number (Picture 2). Keep a note of the long and short labels to cross reference if needed. Begin the watering process.

The pots need to be well watered to begin with then light spraying the pots will be all that is required. Either place the pots where a sprinkler will reach them, or hand spray the pots each day. The pots do not need to be continuously wet for the seeds to germinate.

Only seeds that are still living (viable) will germinate and grow. Regular watering gives close to ideal conditions, which maximises the number of seeds that germinate. This gives an indication of the type and number of plants that have the potential to germinate over the coming summer.

Identifying seedlings

Seeds should begin germinating about 7-10 days after watering has begun and within a few weeks your pots could look like Picture 3. It can take a few weeks to clearly identify some grass seedlings and in rare cases the seedling needs to seed itself to allow identification.



Picture 2. Pots filled with a sand base, topped with the soil sample, labelled and ready to be watered.



Picture 3. Herbage seedlings.

Mitchell grass seedlings can be slow to get growing, so be patient. If your pots are getting crowded with herbage seedlings you can pluck these out to leave room for the grass seedlings you are waiting to identify.

There are several features to help identify Mitchell grass seedlings from other grass seedlings (Table 1). The differences between the four species at seedling stage are most evident by looking at the leaves and stems.



Mitchell grass seedlings (Picture 4):

- Have pale stripes running along the bottom two leaves (parallel veins).
- Lack hairs at the base and stems.
- Often have a large seed attached at the base that is still visible on the soil surface.

The few differences between the 4 species of Mitchell grass are:

- Barley Mitchell has easily visible hairs on the upper surface of the leaf
- Bull Mitchell has obviously flattened stems.
- Curly Mitchell has rounded stems.
- Hoop and Barley Mitchell stems may be slightly flattened.

Picture 4. A 6-day old Mitchell grass seedling.

Common species that may be confused with Mitchell grass include Feathertop, Spring/Cup grass and Queensland bluegrass.

Table 1. Distinguishing features of native grass seedlings (J. Silcock, 2007 unpublished)

Species	Distinguishing Features of Seedlings
Feathertop (<i>Aristida latifolia</i>)	Often resembles a feathertop seedhead, with 3 straight leaves; ring of fine, spindly hairs at each stem joint; long, slender leaves; dead ones tend to curl around the base of the plant.
Button grass (<i>Dactyloctenium radulans</i>)	Bright green leaves with a prominent mid-vein; hairs spread along leaf margins, becoming increasingly sparse further from the stem; densely woolly leaf sheath
Queensland bluegrass (<i>Dichanthium sericeum</i>)	Prominent ring of hairs around the stem joints, resembling ballerina skirts; leaves grey-green or blue in colour
Digitaria spp.	Woolly base, but only very fine hairs around stem joints and leaf margins
Delicate lovegrass (<i>Eragrostis tenellula</i>)	Fine, dainty grass with parallel veins evident on lower leaves and sparse, fine hairs on stem joints and leaf margins
Spring or Cup grass (<i>Eriochloa crebra</i>)	Smooth, long, bright green hairless leaves with prominent mid-vein, widely spaced along stem; slightly swollen, soft woolly stem joints
Flinders grass (<i>Iseilema spp.</i>)	Soft and hairless with flattened stems; base is often red purple in colour, with leaves also gaining a reddish tinge as the plant matures
Australian dropseed (<i>Sporobolus australasicus</i>)	Hairless, slender stems; leaves smooth, hairless and light, bright green with faint parallel veins

There is generally no need to reseed country where there is seed in the soil. If Mitchell grass seedlings grow in your pot, there will be enough seed in the soil for pasture recovery. If you intend for pasture to recover from the seedbank you may need to consider spelling the paddock or reducing stocking rate to allow seedlings time to establish before the dry season.

For more information regarding Mitchell grass management including spelling please refer to:

For more information regarding management options please refer to:

Best bet grazing management Mitchell grasslands <https://futurebeef.com.au/wp-content/uploads/2017/08/Best-bet-grazing-management-Mitchell-grasslands-2012.pdf>

Managing Mitchell grass: A grazier's guide https://futurebeef.com.au/wp-content/uploads/managing_mitchell_grass_a_graziers_guide-LR.pdf

Special thanks to Dr. David Phelps and Millie Sheales for their assistance in preparing this factsheet.

If you'd like some help or more information please contact Jane Tincknell, Department of Agriculture and Fisheries – Longreach 0472 877 271 or jane.tincknell@daf.qld.gov.au.