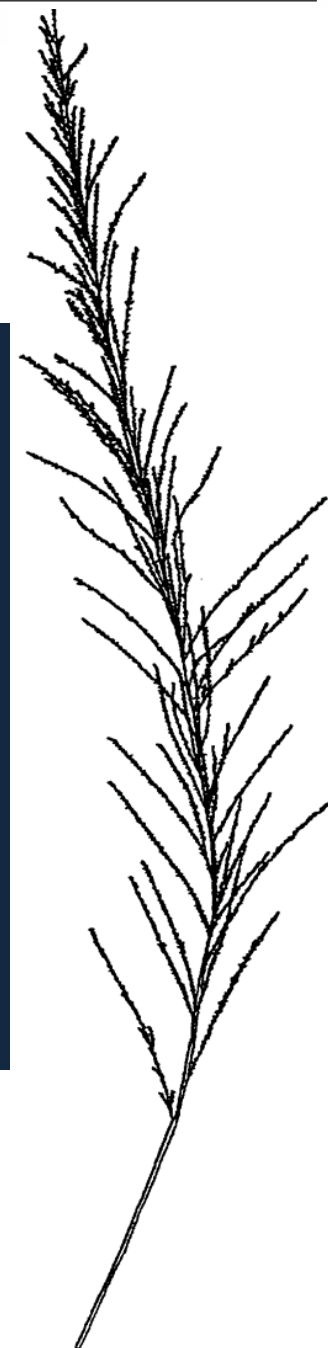



Giant Rats Tail Grass – fundamentals and insights for management

Dr Wayne Vogler
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Biosecurity Queensland - DAF

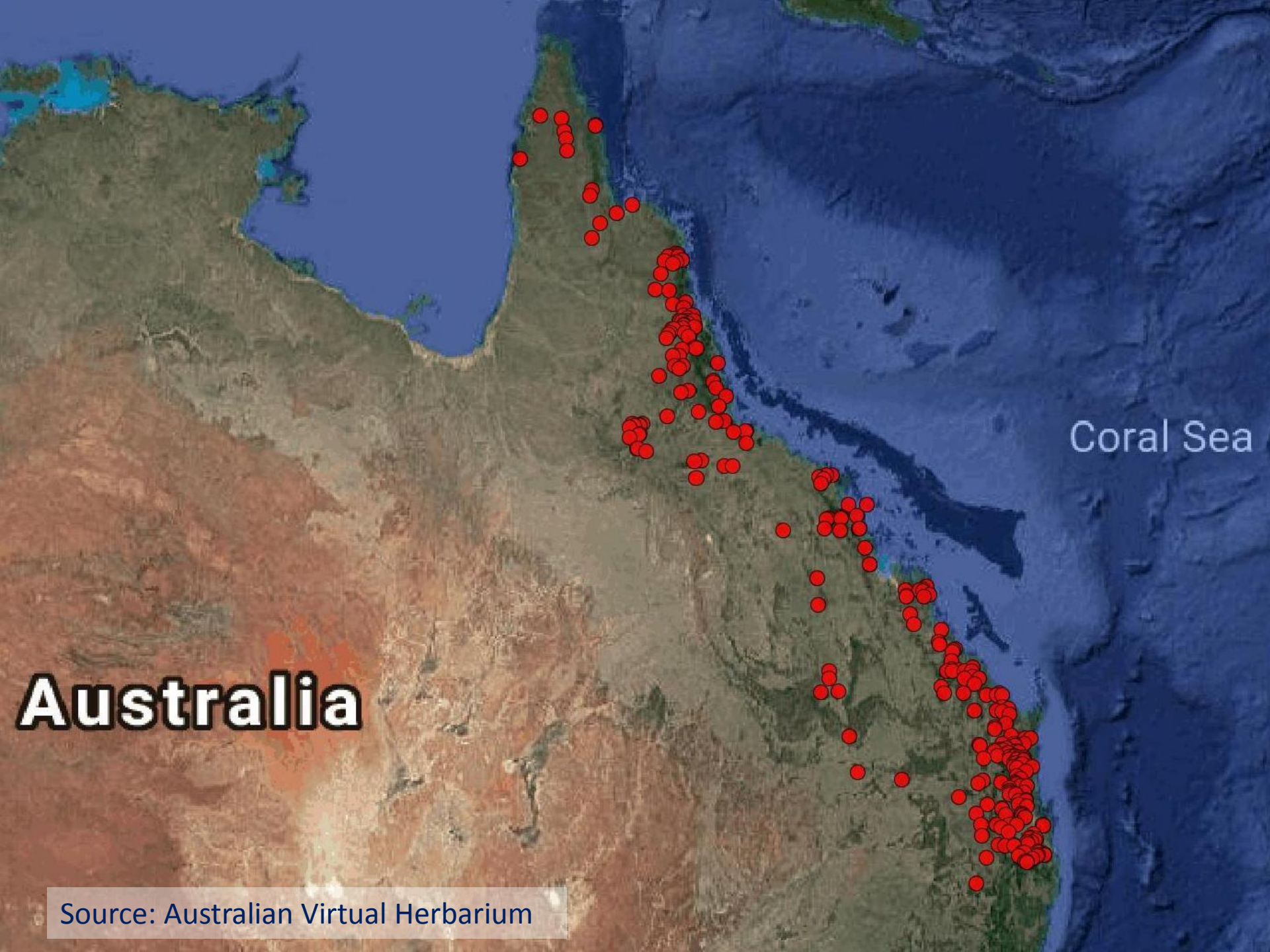


A photograph of a natural landscape. The foreground and middle ground are filled with tall, dense grasses that have turned a golden-brown color, suggesting late summer or autumn. The grasses are thin and wispy, with some green still visible at the base. In the background, a dense forest of birch trees stands. The birch trunks are light-colored, some appearing white or light grey, and are partially obscured by the dark green foliage of their canopies. The lighting is bright, creating strong contrasts between the sunlit grass and the shaded forest.

Sporobolus pyramidalis and
Sporobolus natalensis

Giant rat's tail grass:

- Significant weed in Queensland, grazing industry and wider environment.
- Millions of dollars in lost production and control costs annually.
- Understanding basic characteristics about these weeds assists management.
- Using this information to develop strategies as part of normal property management
 - supports weed, pasture and business management goals,
 - assists meeting biosecurity obligations.
- Minimising the risk of spread and protecting clean areas
 - reduces future weed control costs and production losses.



Coral Sea

Australia

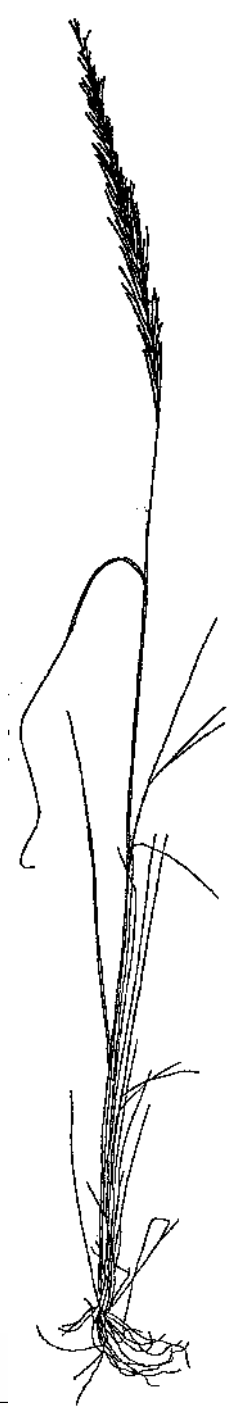
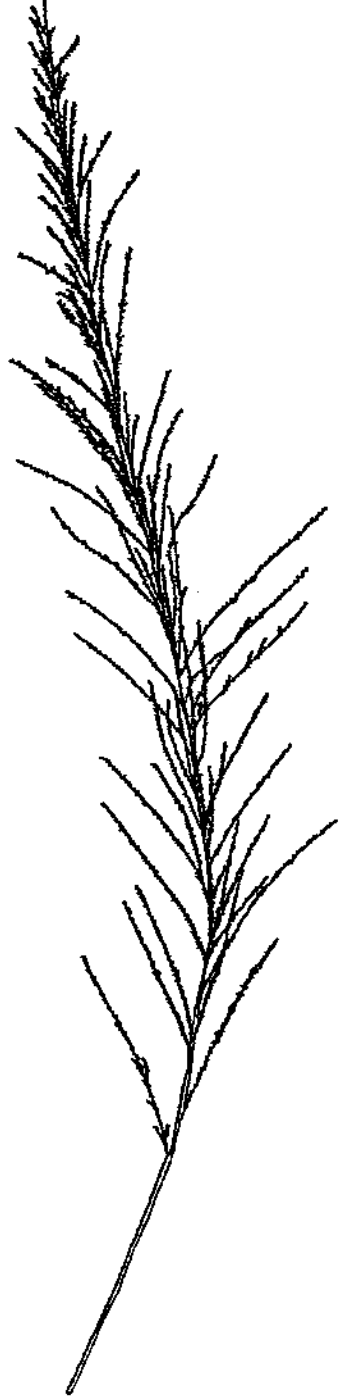
Source: Australian Virtual Herbarium

Graziers report 10 to 80% loss in carrying capacity depending on density of infestation from GRT



Graziers report 10 to 80% loss in carrying capacity depending on density of infestation from GRT

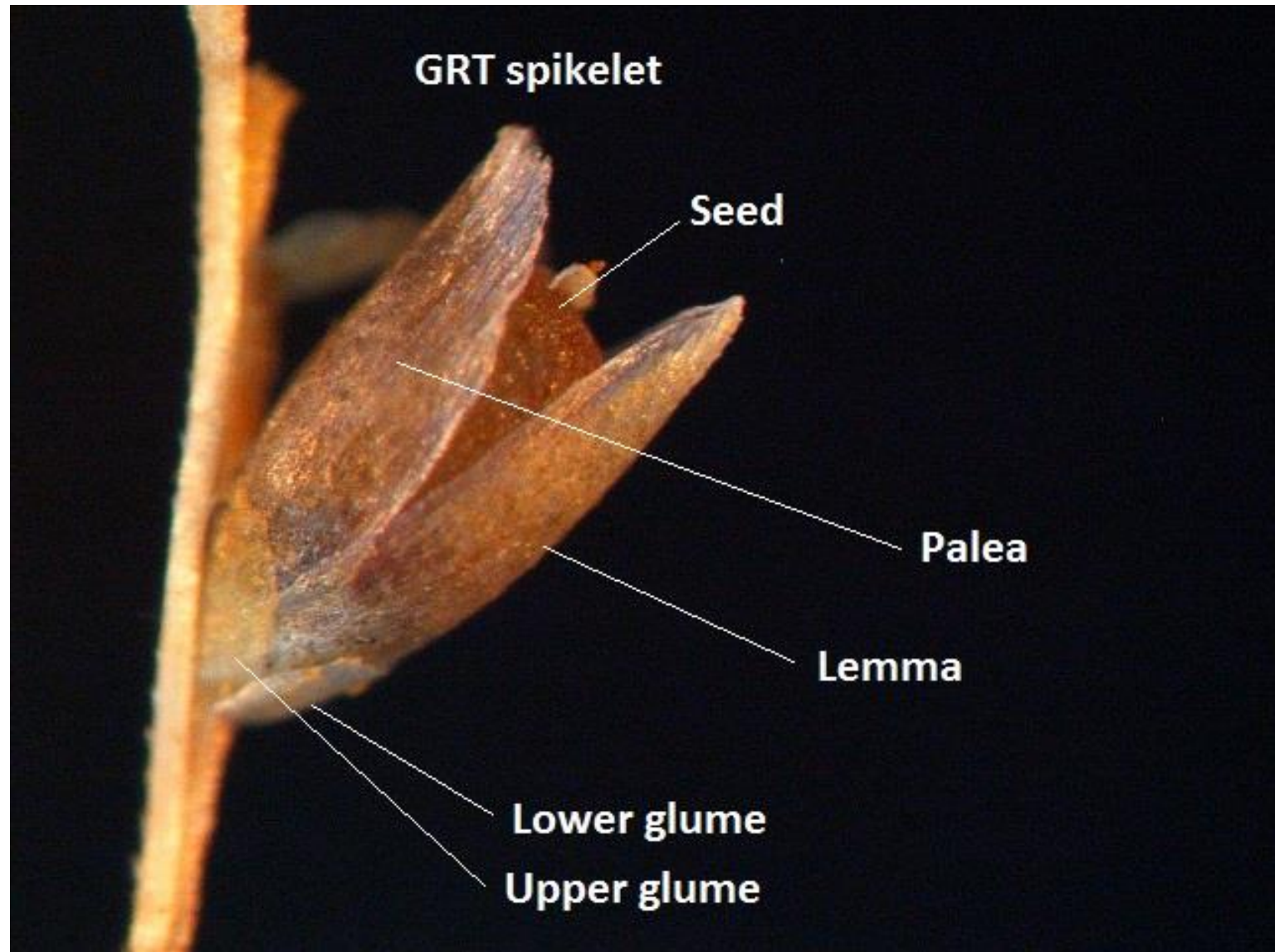




Identification is difficult

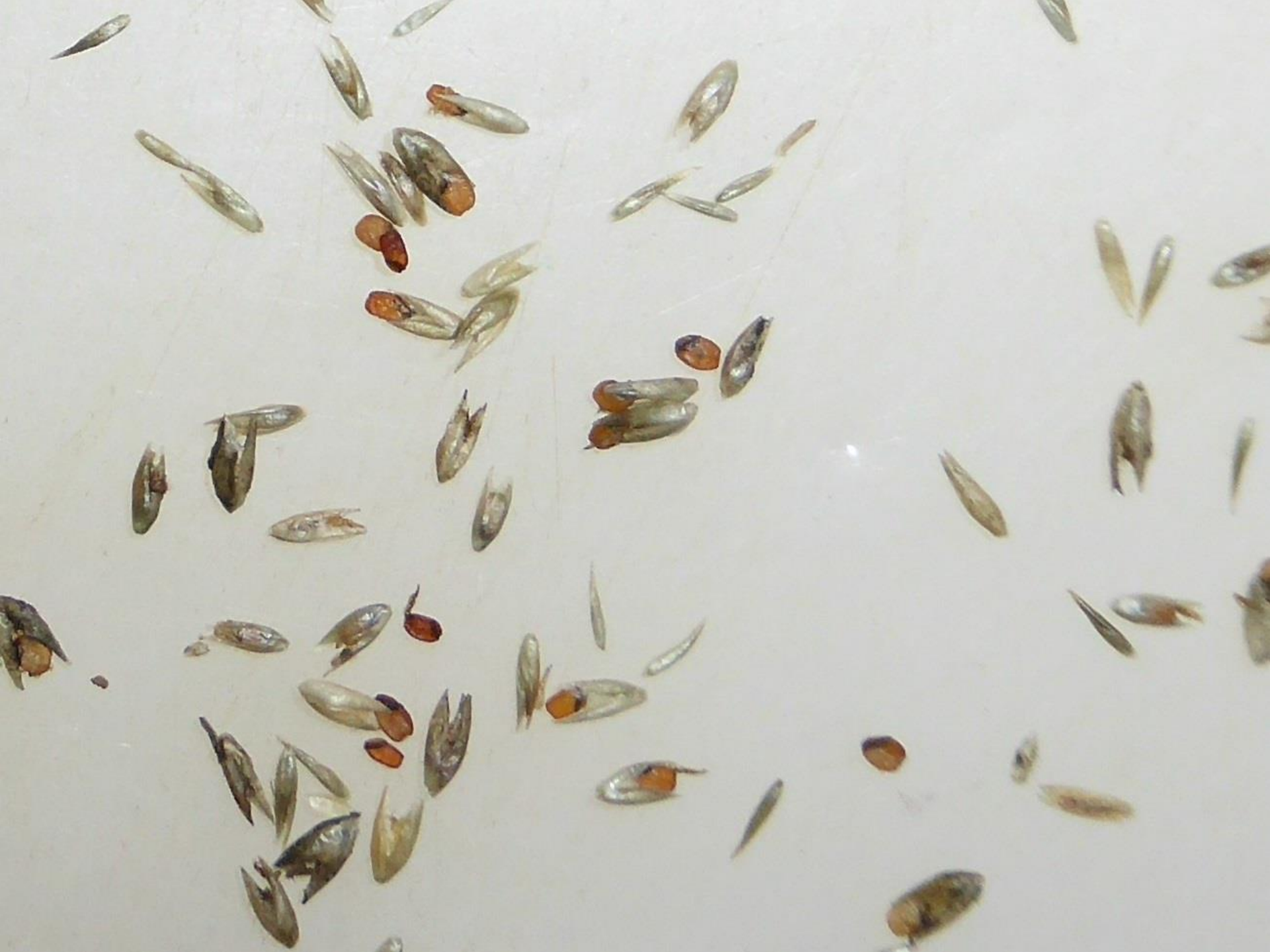




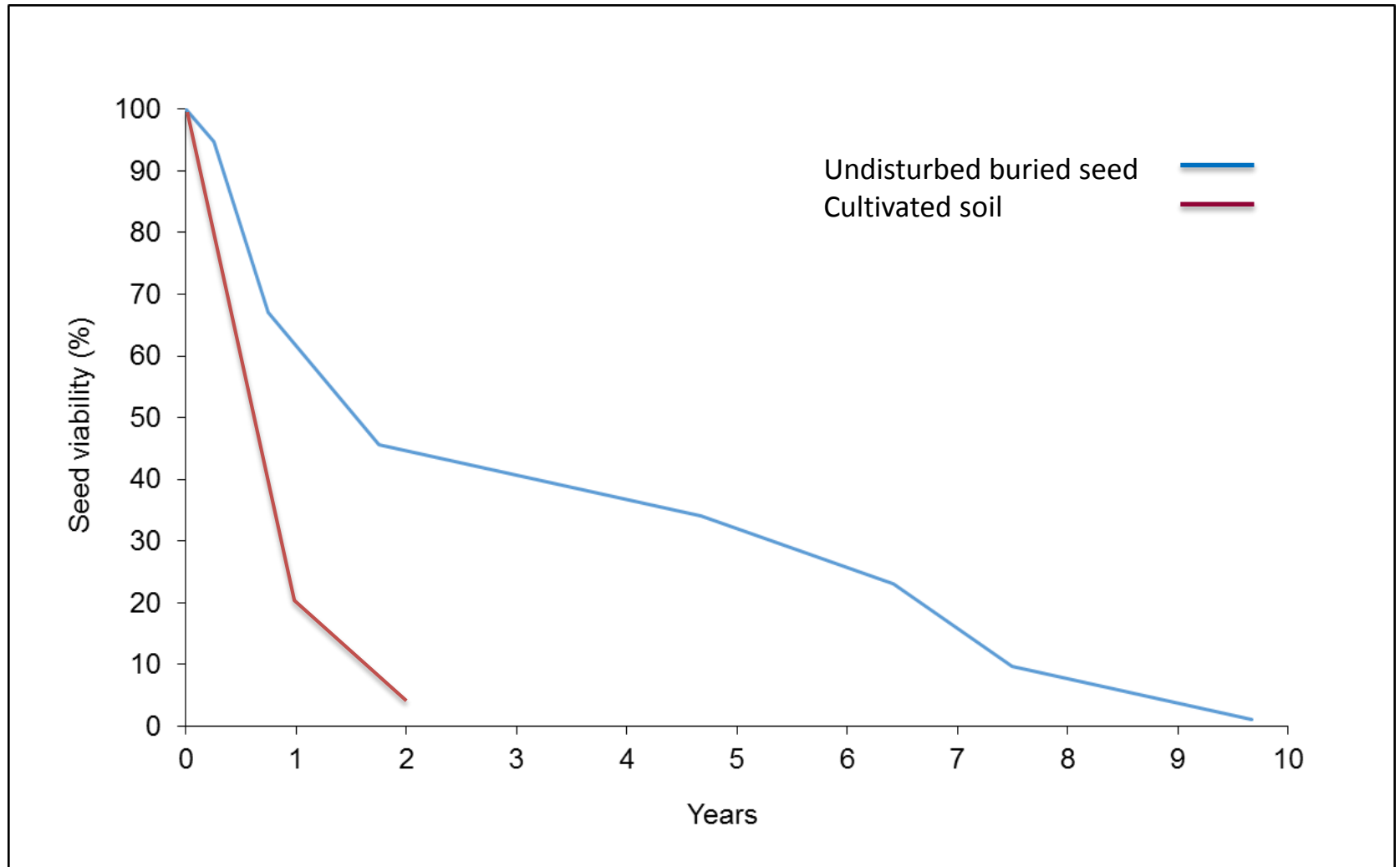


Stands of GRT are generally characterised by:

- Large (780 to 7650 seeds/m²), persistent (3 to 10 years) soil seed banks
- High seed production (1885 to 85420 seed/m², 210 to 570 seeds/inflorescence)
- Seed and seedlings at any time of the year given adequate soil moisture and suitable temperatures
- High viability of fresh seed (>90 %)



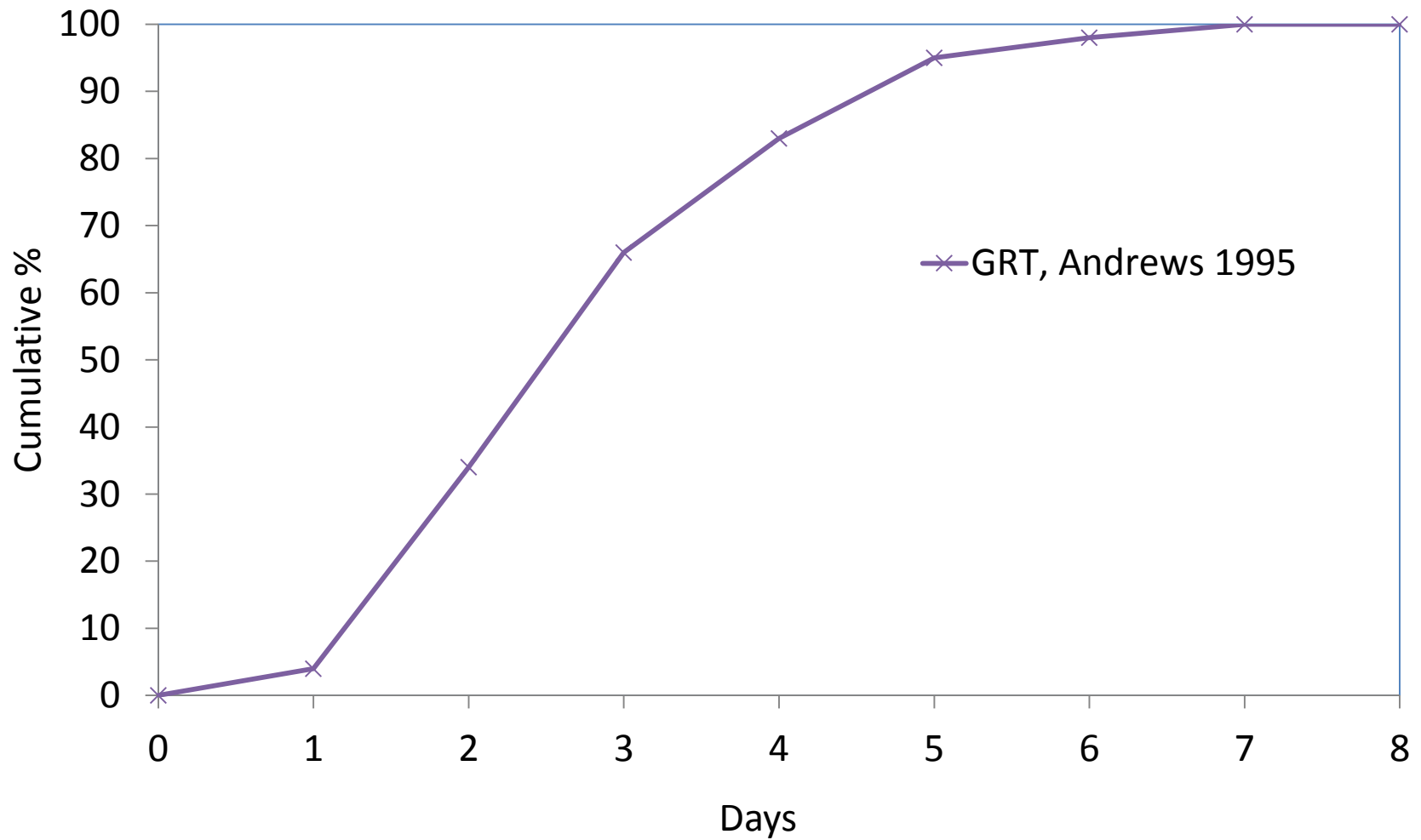
GRT Seed longevity



Time to inflorescence emergence and total inflorescence number over 11 months following sowing of 50 GRT seed in canopy gaps in February 1998 (adapted from Bray 2004)

Gap Size (cm)	Time till inflorescence emergence (days)	Inflorescence number per plot
No Gap	No plants	No plants
15 x 15	No flower	0
30 x 30	No flower	0
60 x60	342	4
120 x 120	243	33

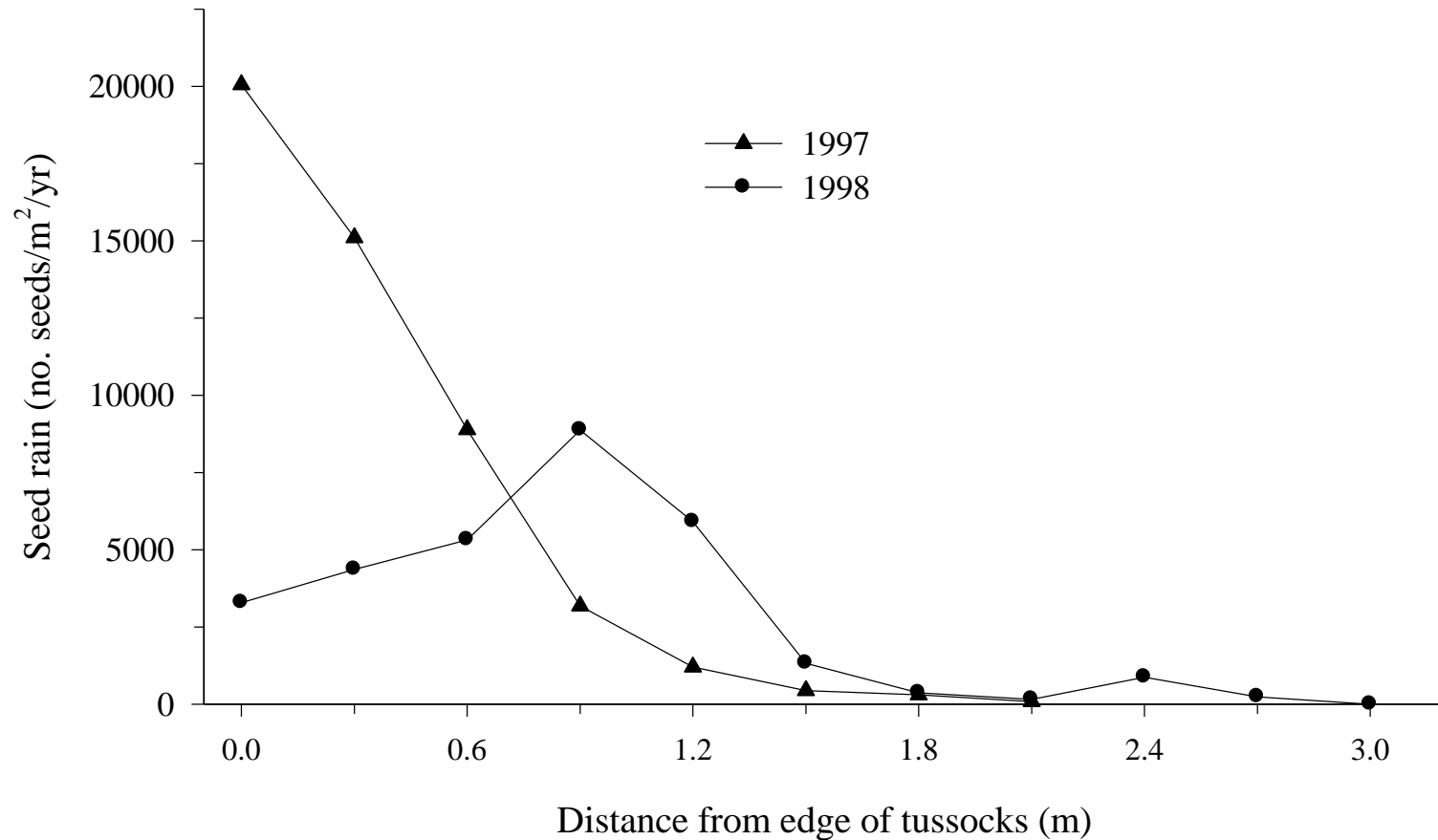
GRT seed passage through cattle



Viability of seed ingested by cattle

- 19 % remained viable (Andrews 1995)
- Giant Parramatta Grass (Andrews 1995)
 - Estimated 8300 seeds ingested/heifer/day in heavy infestation
 - Estimated 2200 seeds ingested/heifer/day in light to medium infestation

Distance of GRT seed fall from reproductive tussocks





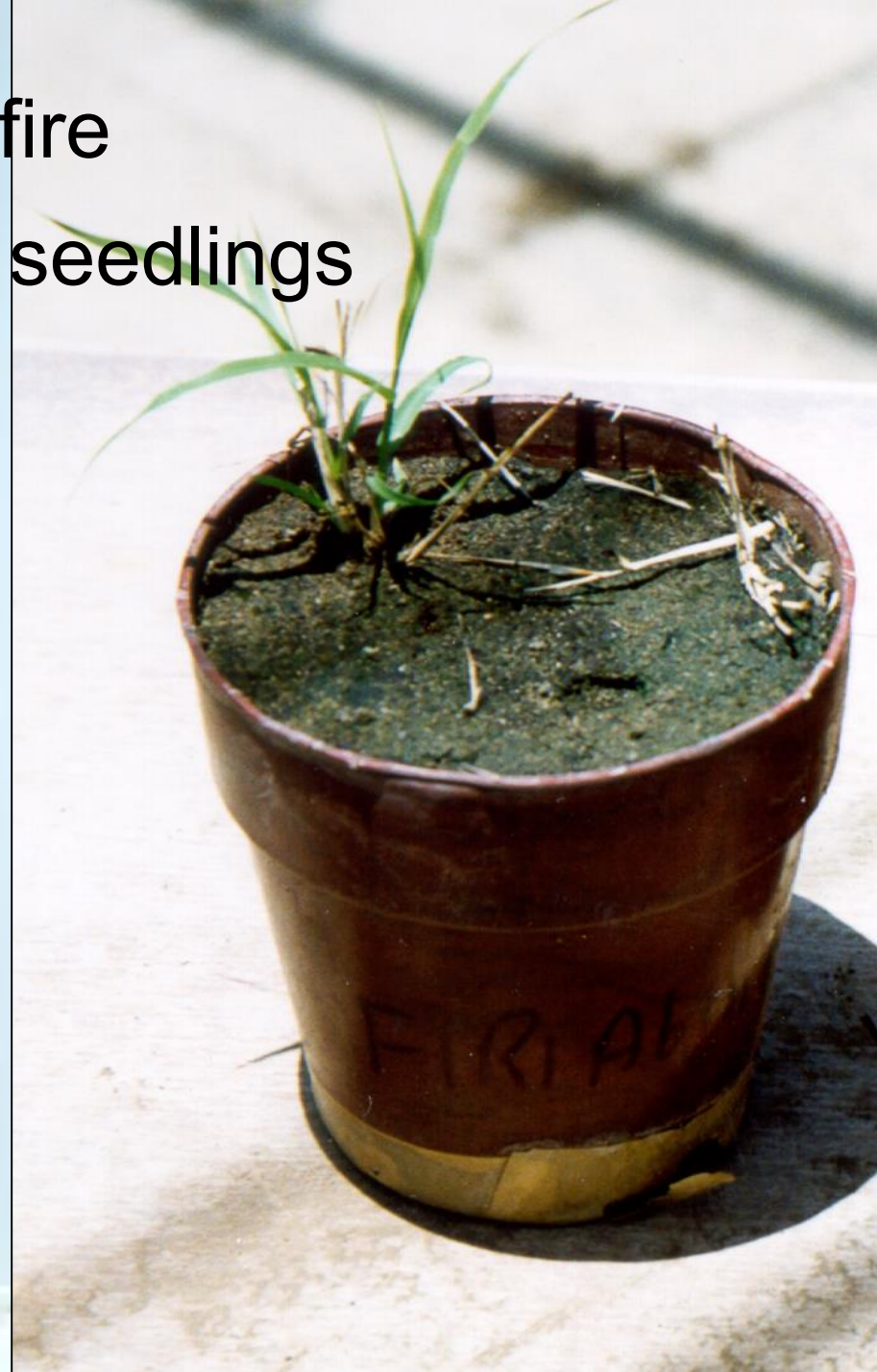
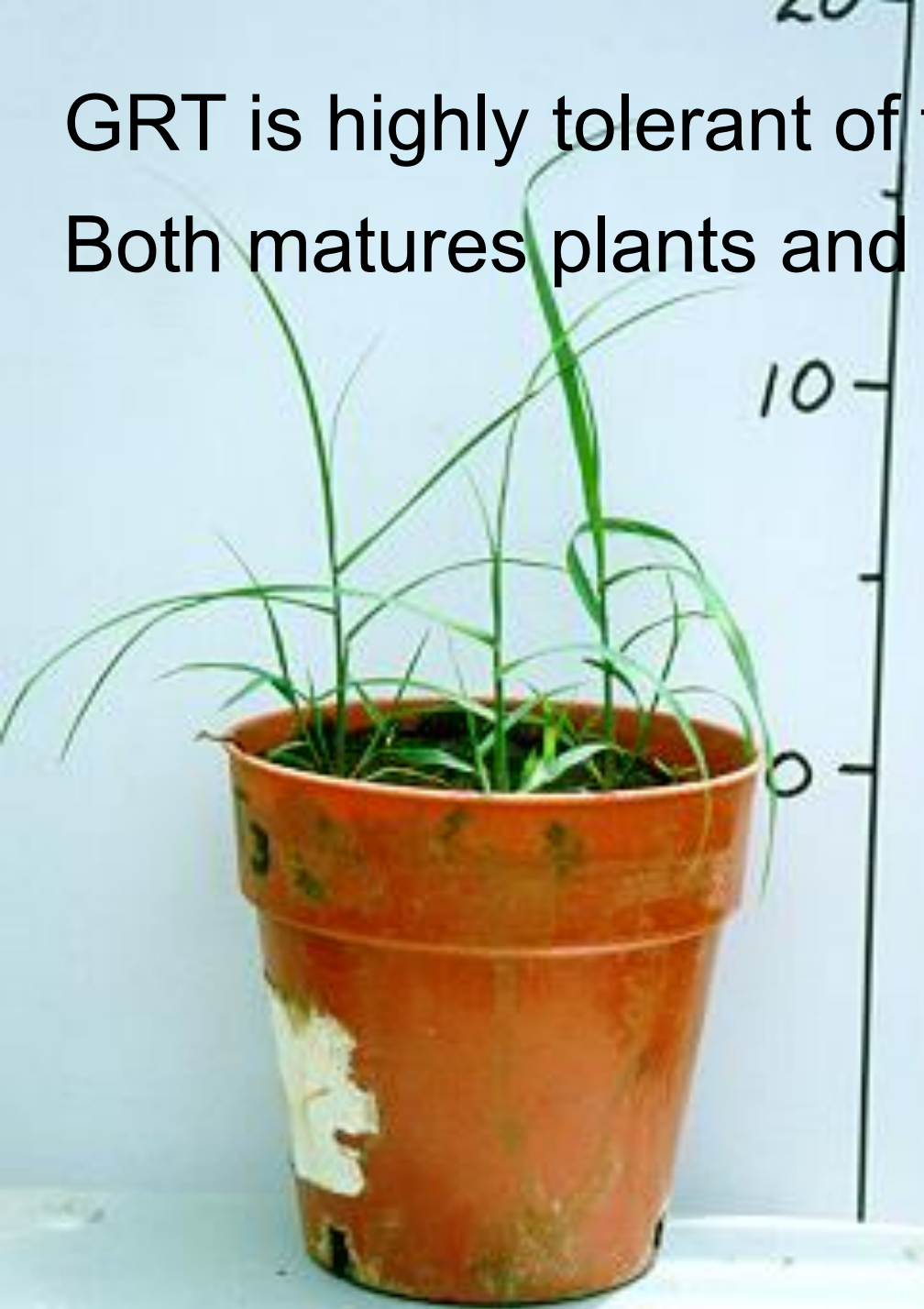


Fire consumes surface seed

Measured 50% reduction



GRT is highly tolerant of fire
Both matures plants and seedlings



Herbicides – flupropanate and glyphosate

- Flupropanate: Liquid (Taskforce, Tussock); Granular product
 - Selective at registered application rates
 - Root and foliar uptake, activated by rainfall
 - Applied as spot, broad acre and aerial treatments
 - Can be applied to actively growing or hayed off plants
 - Slow acting, 3-4 months to kill plants
 - Field observations, seed still produced while plants die
 - Residual activity is variable; 6-12 months based on field obs.
 - Withholding period
 - Spot spray 14 days
 - Broad acre 4 months
 - Livestock off treated pastures 14 days prior to slaughter

Herbicides – flupropanate and glyphosate

- Glyphosate
 - Non-selective at registered application rates
 - Foliar uptake
 - Applied as spot, broad acre and aerial treatments
 - Boom spray, boomless jet and wick wiper
 - Applied to actively growing
 - Field observations, seed still produced while plants die
 - No residual activity
 - Withholding period
 - 1 day following treatment to ensure herbicide has translocated throughout the plant

Seed viability and glyphosate

Days after anther appearance	Description of embryo/seed	Viability not treated (%)	Viability glyphosate (%)
0	Unfertilised embryo	0	0
4	Small, early milk stage.	5	0
8	Small, green/white, seeds; late milk/early dough stage.	55	23
12	Full, green/white seeds; late dough stage.	60	40
16	Full, detached, mature hard seed.	95	86

Management

- Management will require clear objectives.
- Minimise impact, maintain productivity/environmental values.
- Early detection and intervention critical.
- Herbicides in isolation are generally not the answer.
- Long term management.
 - Pasture management to maintain healthy pasture and ground cover.
 - May include addition of fertilizer, sown pastures
- There are no quick fixes with grass.
- Eradication????????

Principles of Farm Biosecurity

- Understanding how seed moves
 - Cattle
 - Vehicles including cattle trucks
 - Water
 - Ferals
- Put in processes to stop/limit seed movement
- Manage what comes on to and moves off your property
- Create a holding area to spell in-coming/out-going cattle
- May involve changing the way a property is fenced



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