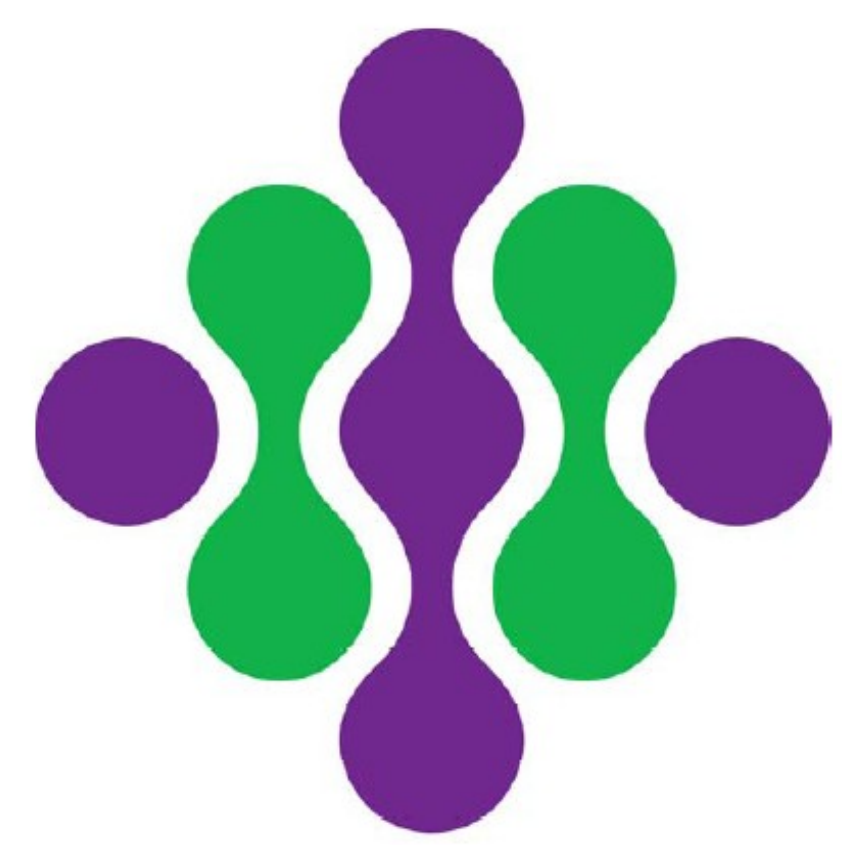


A LONG-TERM GREEN MANURE TRIAL WITHIN INTENSIVE CROPPING IN TASMANIA

LEIGH SPARROW, TANYA BEAUMONT, LEON HINGSTON, GEORGE CRISP AND LYNDON BUTLER

TASMANIAN INSTITUTE OF AGRICULTURAL RESEARCH, PO Box 46, KINGS MEADOWS TAS 7249, AUSTRALIA



tiar
TASMANIAN INSTITUTE OF AGRICULTURAL RESEARCH



Know-how for Horticulture™

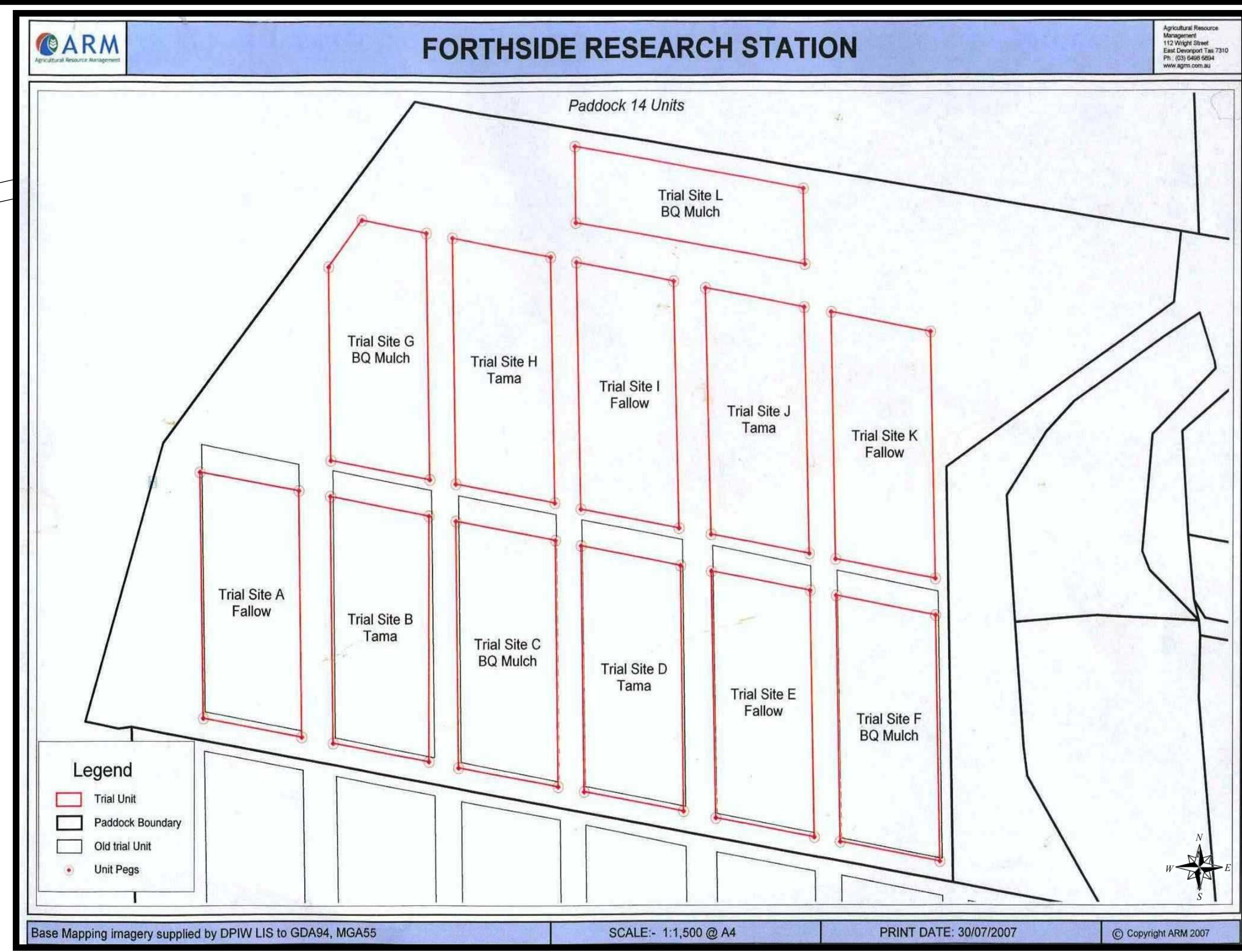


Figure 1: Location of trial site and trial map

Aim:

To compare long-term effects on cash crop performance and soil health of three different autumn-winter land uses:

- Fallow
- Annual ryegrass (Tama) as green manure, and
- Brassica (BioQure BQ Mulch™) green manure.

Potato production and soil-borne diseases (common scab, powdery scab and *Rhizoctonia*) are a particular focus.

Potatoes will be grown in 3- and 6-year rotations which represent short and average rotation lengths for potato crops in the region.

The trial is a randomized block design containing 12 units of about 3000 m² each (Figure 1).

Site Information:

- Mean rainfall: 961 mm/annum
- Mean maximum temperature: 16.1 °C
- Mean minimum temperature: 7.4 °C
- Elevation: 126 metres
- Deep, red ferrosol soil

Measurements:

- Green manure biomass
- ITC content of soil after brassica incorporation
- Cash crop yield and quality
- Soil carbon
- Soil chemical and physical measures
- Soil biology (BIOLOG, fluorscien diacetate, potato pathogen DNA)

Results to date:

Only one cash crop (barley) has been grown since the first green manures were planted in 2007. There was no effect of green manures on barley yield or grain quality.

Potato pathogen DNA in topsoil varied over time ($P < 0.001$, Figures 2 and 3 show examples), presumably in response to the 2006/07 potato crop, but there was no main effect of green manures except on DNA of *Rhizoctonia* AG3 (Figure 2), where, perhaps surprisingly, fallow soil had more DNA on average than soil from ryegrass plots ($P = 0.025$ on log-transformed data). There were no significant green manure by time interactions.

Monitoring of the trial will continue

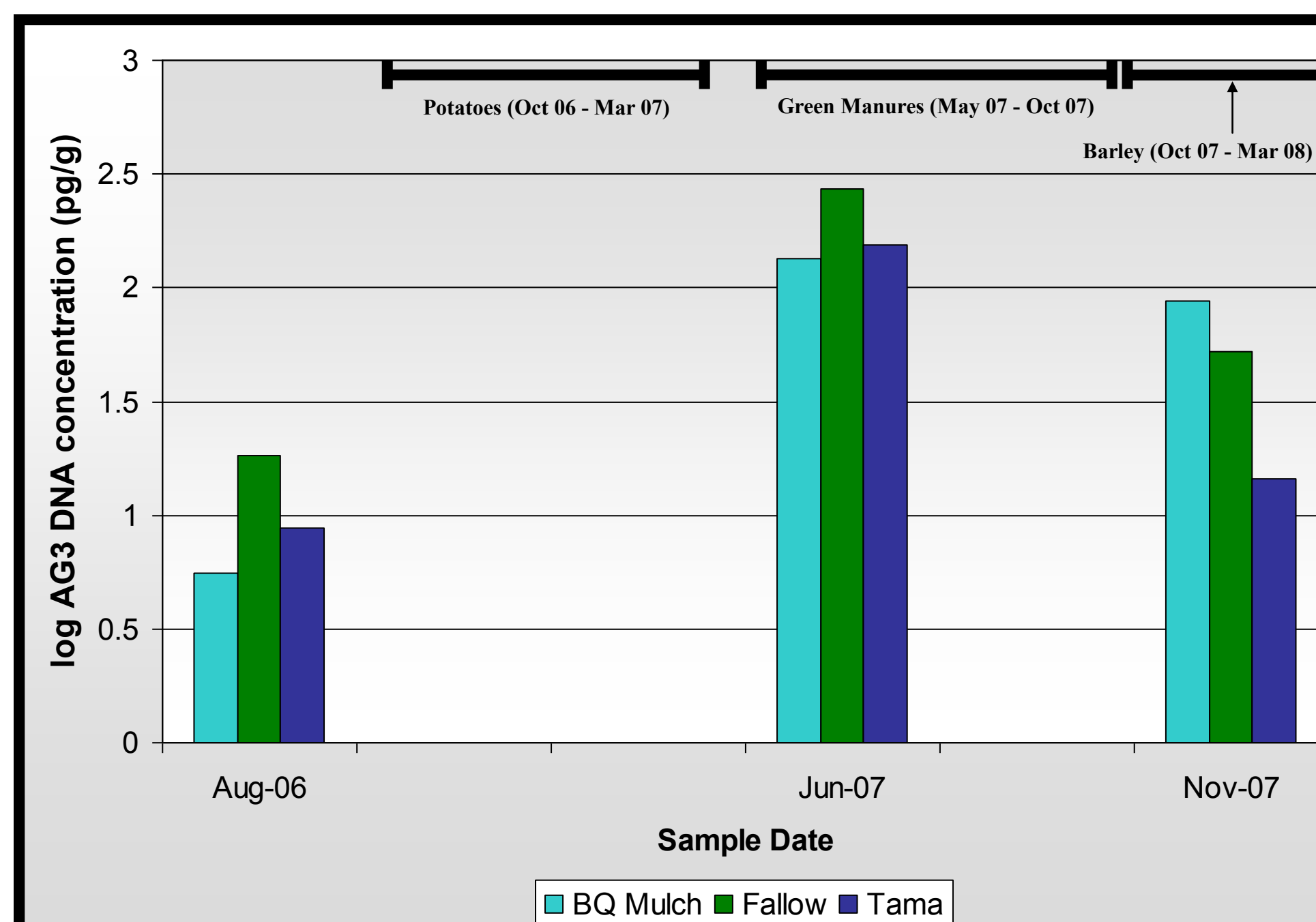


Figure 2: Change in Rhizoctonia AG 3 DNA in soil

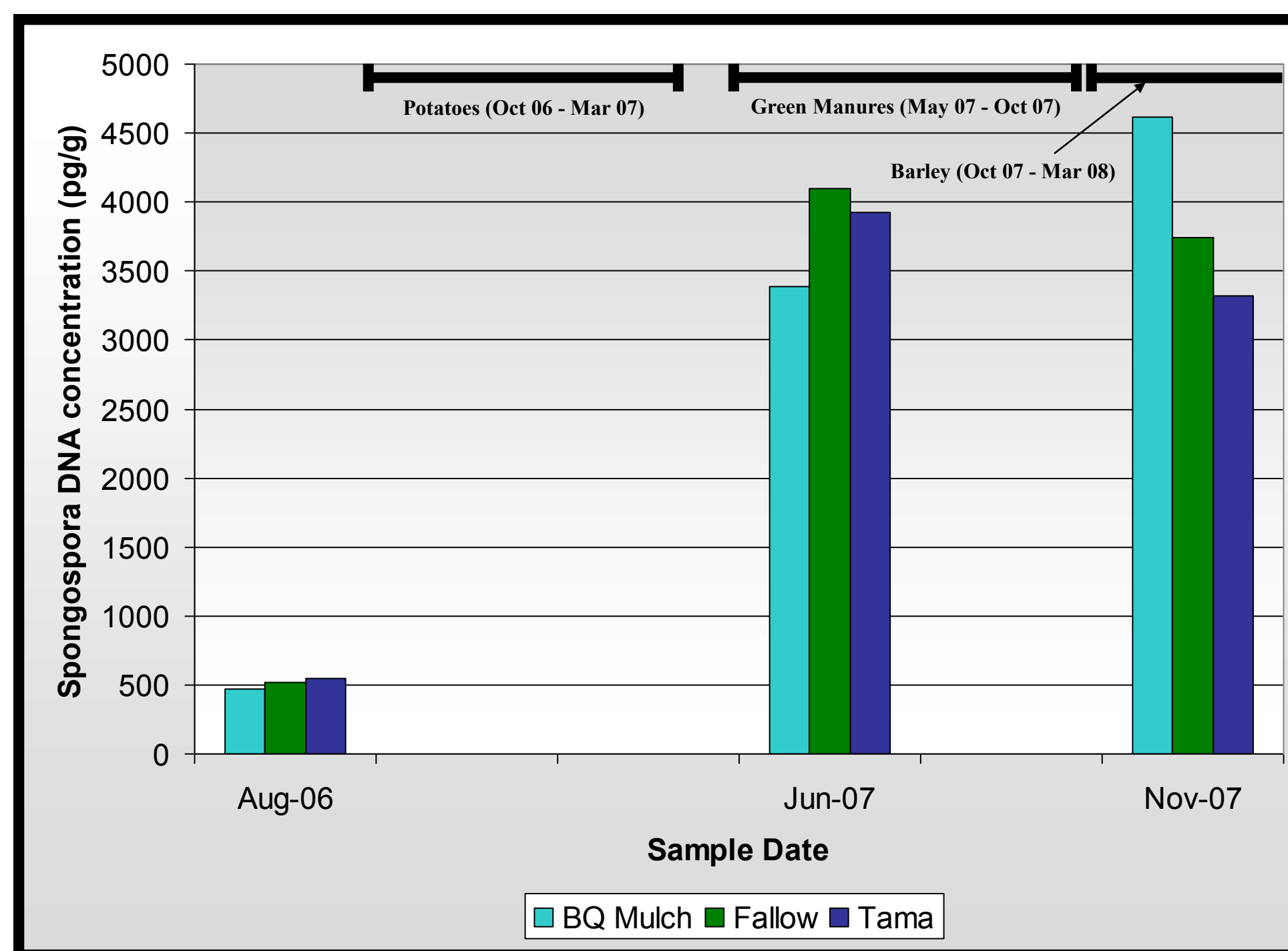


Figure 3: Change in *Spongospora subterranea* DNA in soil

Timeline for trial

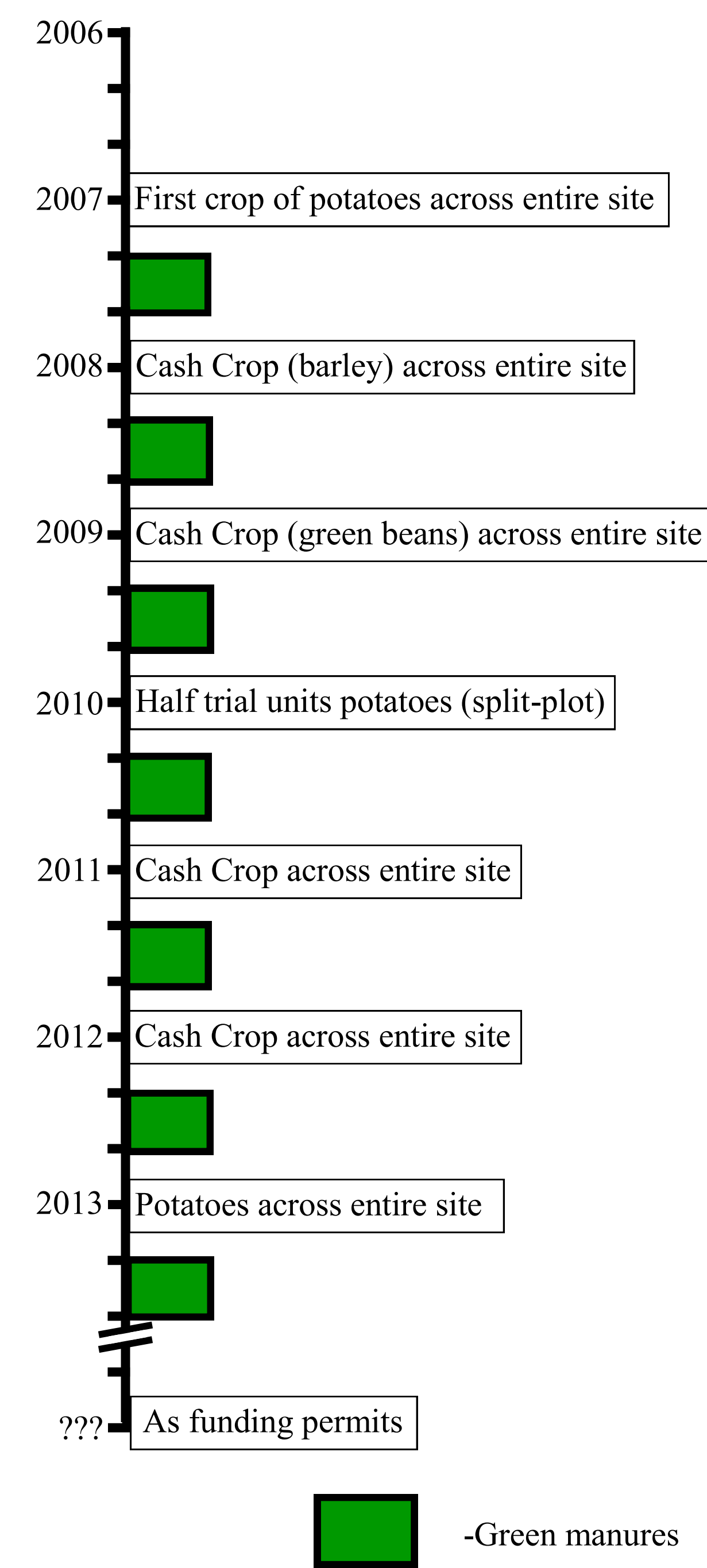


Figure 4: Trial in May 2008 after planting of second green manures, fallow plots are quite obvious.