



July 2013

## MANAGING BROOMRAPE USING GROWING DEGREE DAYS

Management considerations throughout the growing season

### Growing Degree Days (GDD) to track weed emergence

Preventing emergence is the best way to control broomrape. This is achieved by early control to remove host plants in your paddock.

The best time to spray hosts is when all broomrape plants have attached to host roots but well before it emerges so that the pasture or crop recovers and production losses are minimised.

Predicting the growth of broomrape and the best time to spray is not easy as it all happens underground. By using soil temperatures to estimate the rate of plant development, it is possible to calculate the timing of broomrape attachment and emergence.

A running total of average soil temperatures or Growing Degree Days (GDD) can also be used to guide the optimal timing for application of herbicides by predicting when broomrape has reached critical growth stages.

USE GROWING DEGREE DAYS TO:

Track weed emergence

Predict when broomrape has reached critical growth stages

Determine the best time to spray host plants

### What are Growing Degree Days?

For branched broomrape development, GDD are calculated using average daily soil temperatures.

Every day after the start of the season the daily maximum and minimum temperatures are recorded for the top 10cm of soil, added together and then halved.

These averages are then accumulated into a running total.



## The importance of the date of the seasonal break

The GDD for branched broomrape development are accumulated from the date of the “break of season” rain that prompts the germination of hosts in the paddock.

Research in South Australia has indicated that this date corresponds to the day when: -

25mm of rain has fallen over a fortnight period after 1st April.

Subsequent rains prolong the germination of hosts and broomrape attachments.

Farm practices and broomrape control strategies influence the timing of branched broomrape germination and hence GDD accumulation.

For example, planting a crop delays the start date for accumulating GDD from the time of the “break of season” rain until the day of sowing (i.e. last soil disturbance).

Similarly, early season host control delays the start date until the next rainfall event that stimulates a new flush of hosts.

## How GDD help with broomrape management

Laboratory research has shown that broomrape attachments to host roots are first seen after 500GDD.

New attachments continue to form until stems start to emerge.

By 1000GDD there are few new broomrape attachments on host plants. Observations in the field confirm these predictions.

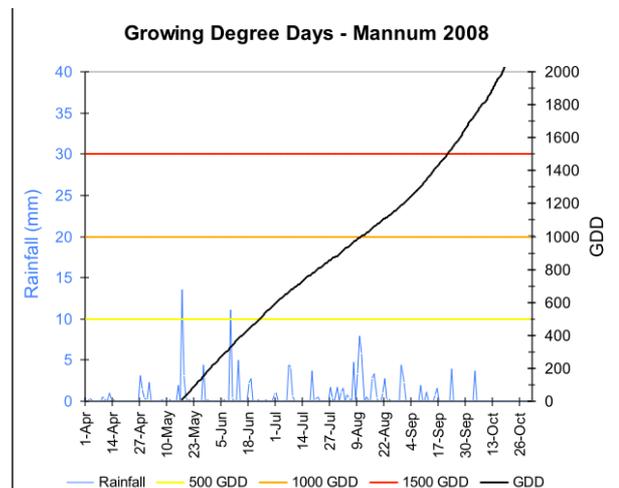
Herbicides to kill broomrapes attached to hosts can be applied from 700GDD onwards. Branched broomrape will begin to emerge from the soil at 1500 GDD.

## An example of GDD application

Looking at the chart displaying data for Mannum in 2008, the break of season occurred on the 17<sup>th</sup> May and GDD are accumulated from that date.

Following the black GDD line, the chart indicates that branched broomrape attachments occurred from the 24<sup>th</sup> June, where the black line crosses the yellow line.

Emergence of branched broomrape in 2008 occurred after 1500 Growing Degree Days from the 21<sup>st</sup> September, where the black line crosses the red line.



These predictions were consistent with field observations.

The best time to spray broomrape is between 700 and 1300GDD. The timing varies every year depending on the season start. Refer to Chapter 5 of the Best Practice Manual for more information.

## For more information

Other Managing Broomrape Fact Sheets and the On Property Management of Branched Broomrape - Best Practice Manual can be found at:

[www.pir.sa.gov.au/biosecuritysa/nrm\\_biosecurity/weeds](http://www.pir.sa.gov.au/biosecuritysa/nrm_biosecurity/weeds)

The SA Murray Darling Basin NRM weather stations provide daily GDD for different Mallee areas.

Visit: [www.aws-samdbnrm.sa.gov.au](http://www.aws-samdbnrm.sa.gov.au)