# Package 'rapsimng.wheat'

September 24, 2026

**Title** Crop-Specific Functions and Parameters for APSIM Next Generation Wheat Model

**Version** 0.1.0

**Description** Provides wheat-specific functions, processes and parameter sets used by wheat model in the Agricultural Production Systems sIMulator ('APSIM') Next Generation. Includes tools for crop process calculations, parameter management and customisation, enabling users to explore, modify and apply wheat model components.

**License** MIT + file LICENSE

**Encoding** UTF-8

**Depends** R (>= 4.1.0)

**Imports** optree, tidyweather

**Suggests** testthat (>= 3.0.0)

**Config/testthat/edition** 3

**URL** https://wheat.rapsimng.bangyou.me/, https://github.com/byzheng/rapsimng.wheat

**BugReports** https://github.com/byzheng/rapsimng.wheat/issues

**Config/roxygen2/version** 8.1.0

**NeedsCompilation** no

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**Repository** CRAN

**Date/Publication** 2026-09-24 05:00:02 UTC

## Contents

thermal_time *Calculate thermal time using cardinal temperatures*

## Description

Calculate thermal time using cardinal temperatures

## Usage

```
thermal_time(
  mint,
  maxt,
  x_temp = wheat$get("phenology.thermal_time.x"),
  y_temp = wheat$get("phenology.thermal_time.y"),
  method = wheat$get("phenology.thermal_time.method")
)
```

## Arguments

| | |
|---|---|
| mint | The minimum temperature |
| maxt | The maximum temperature |
| x_temp | The cardinal temperatures using to calculate thermal time. The default values are c(0, 26, 37) defined in wheat$get("phenology.thermal_time.x"). |
| y_temp | The effective thermal time at the corresponding cardinal temperatures. The default values are c(0, 26, 0) defined in wheat$get("phenology.thermal_time.y"). |
| method | The method to calculate thermal time. The default method is "3hr", which uses the three hour temperature method. The other option is "default", which uses the default method ( maxt + mint ) / 2 - base. |

## Details

The daily thermal time is calculated by interpolating the effective thermal time at three hour intervals between the daily minimum and maximum temperatures, and then averaging these values to get the daily thermal time. For more information about the wheat phenology model, see the APSIM Next Generation Wheat Documentation.

## Value

The thermal time.

## Examples

```
mint <- c(0, 10)
maxt <- c(30, 40)
thermal_time(mint, maxt)
```

`wheat` *Wheat model options manager*

## Description

An options manager for configuring wheat model parameters. This object provides methods to get and set wheat related parameters.

## Usage

```
wheat
```

## Value

An option manager object for configuring wheat model parameters.

## Available Options

**phenology.thermal_time.x** Cardinal temperatures for thermal time calculation. Default: c(0, 26, 37)

**phenology.thermal_time.y** Effective thermal time at corresponding cardinal temperatures. Default: c(0, 26, 0)

**phenology.thermal_time.method** Method used for thermal time calculation. Supported values: "3hr" and "HourlySinPpAdjusted". Default: "3hr"

## Methods

**get(key)** Retrieve the value of an option by its key (e.g., "phenology.thermal_time.x")

**set(key, value)** Set the value of an option by its key

**reset()** Reset all options to their default values

## Examples

```
# Get default thermal time cardinal temperatures
wheat$get("phenology.thermal_time.x")

# Set custom values
wheat$set("phenology.thermal_time.x" = c(0, 26, 37))
wheat$set("phenology.thermal_time.y" = c(0, 26, 0))

# Reset to defaults
wheat$reset()
```

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