

Plant & Food  
**RESEARCH**

RANGAHAU AHUMĀRA KAI



The New Zealand Institute for Plant & Food Research Limited

# Updated asparagus root carbohydrate monitoring system – Aspire Lite phone app.

**Warrick Nelson, Sarah Sinton, Derek Wilson**

# Asparagus physiology research history

- » Plant & Food Research asparagus breeding programme started in the 1970's.
- » Early 1990 irrigation trial; more water = lower yield!
- » Realised that this perennial crop's performance was strongly affected by previous management.
- » Using govt funding, we quantified the relationship between annual carbohydrate (CHO) content dynamics in the root system and subsequent yield.

# Experiment: spear harvest at different times of the year to vary depletion and accumulation of root CHO





# Quantifying root system size – the slow way.....



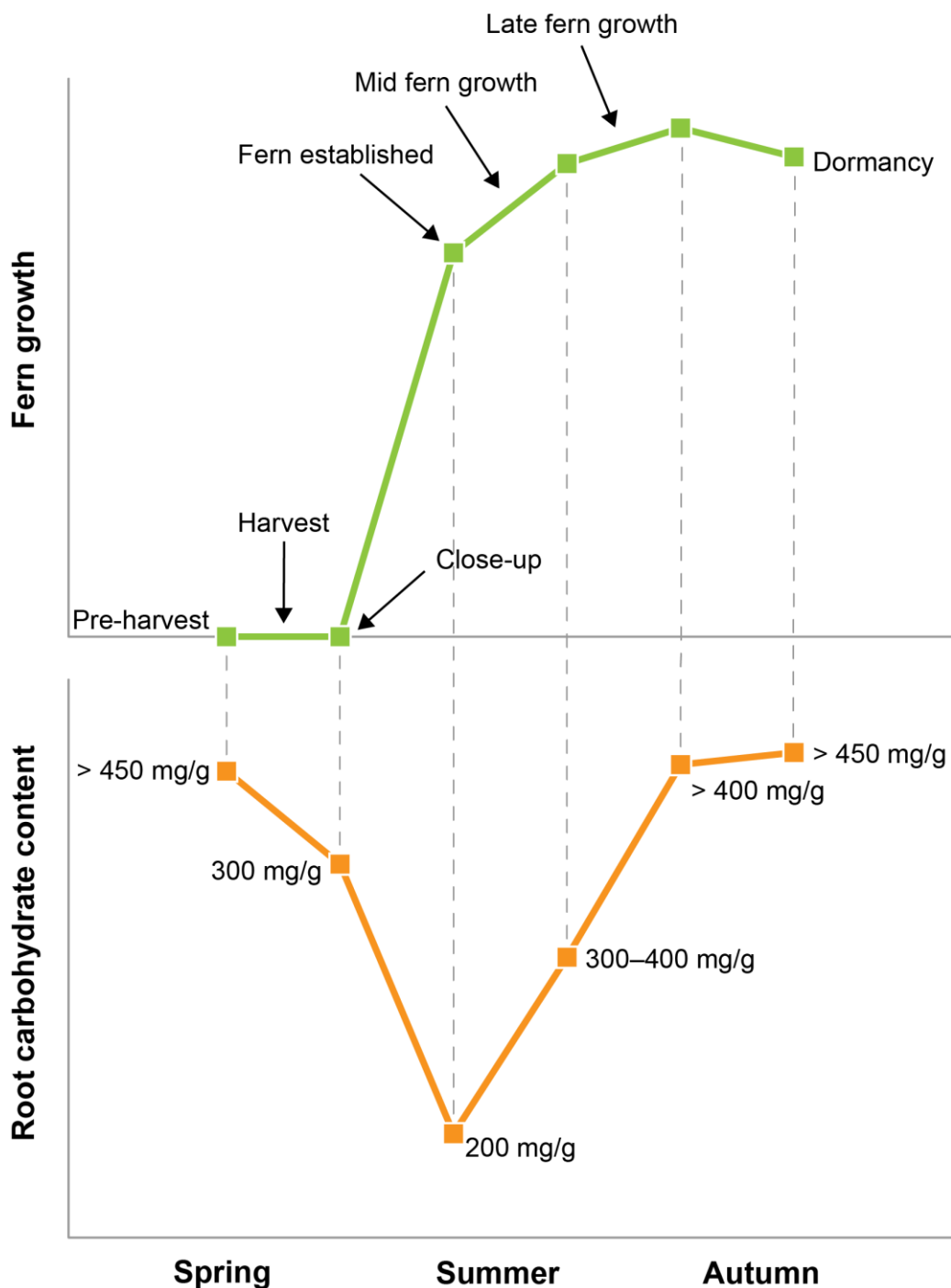
# Quantifying root system size – mechanisation!





# Excavated storage root system





# Principles of Aspire

- » Root system is the 'fuel tank' that drives asparagus performance
- » Size of the system is the tank's total capacity
- » CHO content tells how full the tank is
- » Knowing the amount of fuel in the tank allows better management decisions
- » Tank size more difficult to quantify





# AspireNZ decision support system

The screenshot shows a Netscape browser window displaying the AspireNZ website. The browser's address bar shows the URL [www.aspirenz.com](http://www.aspirenz.com). The website's header features the "AspireNZ" logo and the text "Asparagus Decision Support System". Below the header is a navigation menu with the following items: "Homepage", "Growth Cycle of Asparagus", "How Does AspireNZ Work?", "Features of AspireNZ", "Fees Information", "New User Registration", "Project Team", "Key Contacts", and "Login". The main content area includes a "Welcome to AspireNZ" heading, a paragraph describing the system as an interactive decision support tool for asparagus growers, and a paragraph detailing its development by Crop & Food Research in association with the New Zealand Asparagus Council. A link for "Registered users" to proceed directly to the "Login" page is also present. The footer contains logos for "CROP & FOOD RESEARCH", the "New Zealand Asparagus Council", and "TECHNOLOGY NEW ZEALAND".

AspireNZ - Netscape  
File Edit View Go Communicator Help  
Back Forward Reload Home Search Netscape Print Security Shop Stop  
Bookmarks Location: [www.aspirenz.com](http://www.aspirenz.com)  
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**CROP & FOOD RESEARCH**  
Mana Kai Rangahau

Homepage  
Growth Cycle of Asparagus  
How Does AspireNZ Work?  
Features of AspireNZ  
Fees Information  
New User Registration  
Project Team  
Key Contacts  
Login

**AspireNZ** Asparagus Decision Support System

## Welcome to AspireNZ

*AspireNZ* is an interactive decision support system for asparagus growers. It delivers technology developed from crop physiology research in a user-friendly form to help growers make management decisions to improve production of their crops.

The system was developed by Crop & Food Research in association with the New Zealand Asparagus Council (see [Project Team](#)). Funding was provided by the New Zealand Asparagus Council and Technology New Zealand.

Registered users can proceed directly to [Login](#).

**CROP & FOOD RESEARCH**  
New Zealand Asparagus Council  
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# Method for measuring root CHO content

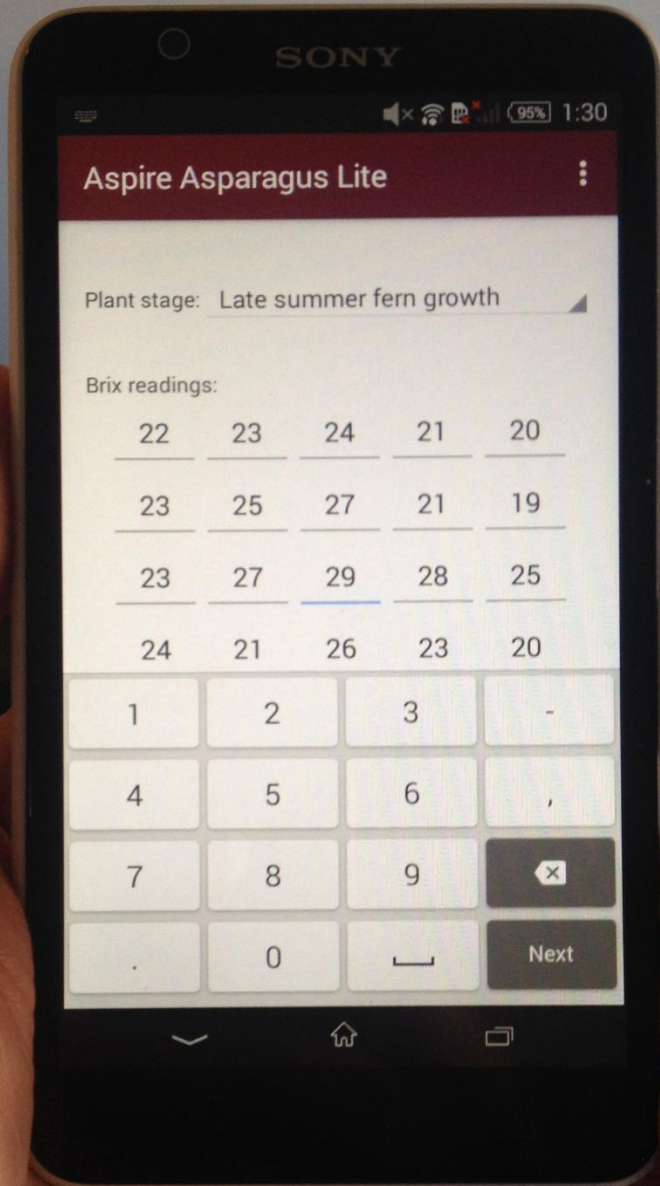


# Main uses of the *Aspire* system

- » Knowing how much CHO reserves are available at the start of the harvest season
- » When to stop (or continue) harvesting
- » Monitoring fern efficiency and health



# Aspire Asparagus Lite arrives



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Parent Guide



# Aspire Asparagus Lite

888 Management Ltd Tools

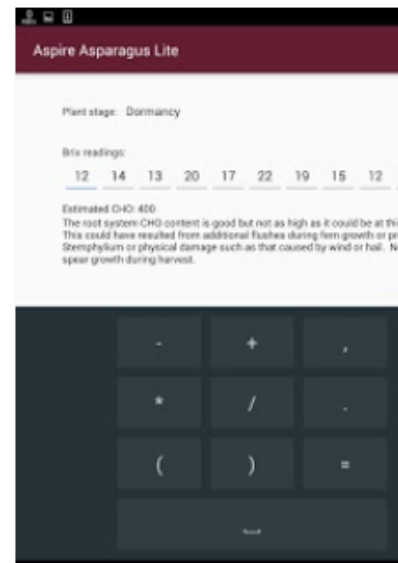
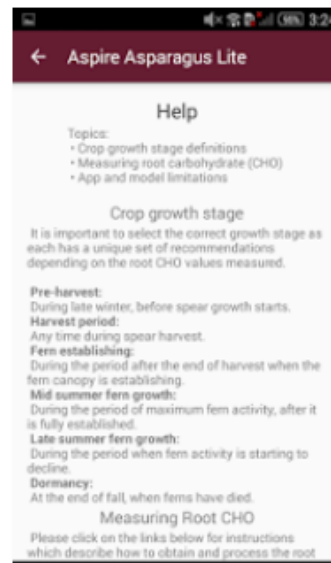
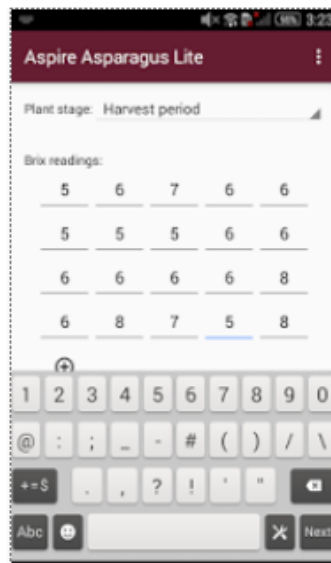
★★★★★ 2

3+

⚠ You don't have any devices

➕ Add to Wishlist

Install



The calculator receives grower measurements of Brix from asparagus roots and translates this into a carbohydrate content. This calculation can then give guidance on harvesting strategy based on growth stage of the plants.

# Aspire Asparagus Lite

Plant stage: Late summer fern growth

Brix readings:

22	23	24	21	20
----	----	----	----	----

23	25	27	21	19
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23	27	29	28	25
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24	21	26	23	20
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1	2	3	-
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4	5	6	,
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7	8	9	✕
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Selector for  
Help and  
Licence

To choose  
Plant stage

Move to next  
number





## ← Aspire Asparagus Lite

### Help

Topics:

- Crop growth stage definitions
- Measuring root carbohydrate (CHO)
- App and model limitations

### Crop growth stage

It is important to select the correct growth stage as each has a unique set of recommendations depending on the root CHO values measured.

**Pre-harvest:**

During late winter, before spear growth starts.

**Harvest period:**

Any time during spear harvest.

**Fern establishing:**

During the period after the end of harvest when the fern canopy is establishing.

**Mid summer fern growth:**

During the period of maximum fern activity, after it is fully established.

**Late summer fern growth:**

During the period when fern activity is starting to decline.

**Dormancy:**

At the end of fall, when ferns have died.

### Measuring Root CHO

Please click on the links below for instructions which describe how to obtain and process the root

## ← Aspire Asparagus Lite

### Legal

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## Aspire Asparagus Lite

Plant stage: Pre-harvest

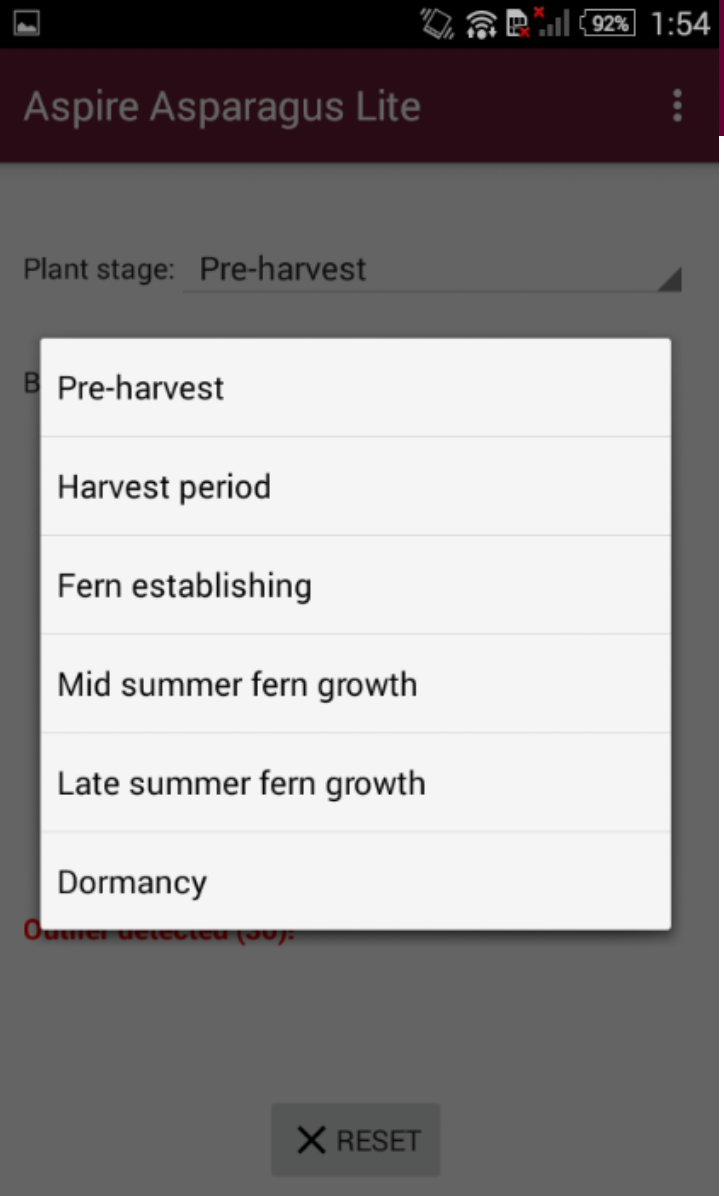
Brix readings:

22	23	24	21	20
23	25	27	21	19
23	27	30	28	25
24	21	26	23	20



**Outlier detected (30)!**

✕ RESET



# App installs

