



# **Grower Summary**

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## **FV 433**

Watercress: Effect of regular consumption during radiotherapy treatment for early stage breast cancer

Annual 2014

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The results and conclusions in this report may be based on an investigation conducted over one year. Therefore, care must be taken with the interpretation of the results.

## **Use of pesticides**

Only officially approved pesticides may be used in the UK. Approvals are normally granted only in relation to individual products and for specified uses. It is an offence to use non-approved products or to use approved products in a manner that does not comply with the statutory conditions of use, except where the crop or situation is the subject of an off-label extension of use.

Before using all pesticides check the approval status and conditions of use.

Read the label before use: use pesticides safely.

## **Further information**

If you would like a copy of this report, please email the AHDB Horticulture office ([hort.info.@ahdb.org.uk](mailto:hort.info.@ahdb.org.uk)), quoting your AHDB Horticulture number, alternatively contact AHDB Horticulture at the address below.

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AHDB Horticulture is a Division of the Agriculture and Horticulture Development Board.

**Project Number:** FV 433

**Project Title:** Watercress: Effect of regular consumption during radiotherapy treatment for early stage breast cancer

**Project Leader:** Jonathan Swann

**Contractor:** University of Reading

**Industry Representative:** Steve Rothwell, Vitacress

**Report:** Annual 2014

**Publication Date:** 5<sup>th</sup> August 2015

**Previous report/(s):** None

**Start Date:** 01 October 2013

**End Date:** 30 September 2016

**Project Cost:** AHDB project cost: £15,000

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Total project cost: £75,000

## Headline

Boiling watercress has a detrimental effect on the abundance of beneficial phytochemicals whereas microwaving and steaming have a minimal effect.

## Background

Many studies have highlighted the relation between cancer and nutrition: cancer builds upon damage to cellular DNA resulting from carcinogenic environmental factors, in which nutrition plays a major role. Diet and lifestyle factors can influence the development of cancer.

Previous population studies have associated a higher intake of cruciferous vegetables such as watercress with a reduced risk of cancer. The aim of this PhD studentship, a collaboration between the Department of Food and Nutritional Sciences, the University of Reading, the Institute of Molecular Medicine at the University of Lisbon, the Radiotherapy Department of the University Hospital of Santa Maria, Vitacress Portugal SA and Vitacress Salads Ltd, is to evaluate the impact of eating watercress on the health and disease outcome of breast cancer patients referred for Radiotherapy Treatment (RT).

The first part of the work focused on quantifying the impacts of cooking watercress on its nutritional benefits because it is well known that cooking can induce several physical and chemical changes in foods, including shifting phytochemical contents. This can have a detrimental effect on the associated health benefits associated with the antioxidant properties, chemo-preventive and anti-cancer effects of foods. Current literature suggests that the observed benefits from watercress consumption are not solely due to its phenethyl isothiocyanate (PEITC) chemical content, but are rather a synergistic effect of several watercress-derived phytochemicals like glucosinolates, carotenoids and phenolics. As such, it was important to characterise the impact of cooking on the entire phytochemical signature of watercress and use this information to guide the preparation of watercress in the follow-on studentship clinical studies.

The first phase of work at Reading has been completed. The impact of preparation for consumption of watercress upon the levels of the beneficial bioactive components in the prepared meal was assessed. Watercress was prepared for eating through 5 different methods: boiling, microwaving, steaming, chopping and homogenising and making it into a

smoothie after which the following phytochemical profiles were assessed: phenolic, carotenoid, glucosinolate content and antioxidant activity.

## **Results**

At present we are unable to publish the full results of the study as the PhD student aims to publish these first (a request which was been approved by AHDB Horticulture) but the overall results are that boiling watercress has a detrimental effect on the abundance of beneficial phytochemicals whereas microwaving and steaming have a minimal effect.

## **Financial Benefits**

The promotion of the health benefits of regular watercress consumption leads to significant and sustained sales increase. Peer reviewed scientific publications are required to substantiate such claims so it is hoped that the study will generate one or more such publications. The Retail Sale Value (RSV) of UK watercress is estimated to exceed £50Mpa. A similar study and associated PR campaign in 2007 lifted sales by 40%. An uplift of 10% is deemed reasonable, worth £5Mpa in gross sales value of which over 50% would accrue to watercress producers.

## **Action Points**

There are no action points for growers at this stage.