Up-skilling Water Managers on Expert Irrigation Systems

WVG1001

Final Report

vegetablesWA

103 Outram St, West Perth WA

NATIONAL PROGRAM FOR Sustainable Irrigation

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Executive Summary

This project provided for the extension of the Vegetable Irrigation Scheduling System (VISS). The VISS increases irrigation water use efficiency by advising irrigation managers of the specific irrigation needs of crops by accounting for plant growth factor, soil type and local evaporation rates. As a result of the project, VISS has been adopted by managers responsible for an estimated 20% of the water used by the vegetable industry on the Swan Coastal Plain. The knowledge about irrigation management of a much broader range of growers has also improved through the project. Increased water use efficiency is important to securing the ongoing viability of the vegetable industry as it is considered a key limiting resource.

The project has also contributed to the more sustainable management of the ground water resource because it has the potential to reduce the incidence of over-watering. Decreased over-watering is associated with reduced leaching of water and nutrients back to the aquifer.

Grower feedback consistently indicates that their preferred extension mechanism is face-to-face contact. This project provided for a Field Extension Officer to provide information about the technology and the ongoing support required to assist adoption. A series of grower workshops were held across the main growing regions to improve grower knowledge of irrigation management with a focus on explaining the VISS. The Field Extension Officer held subsequent one-on-one meetings with growers on their properties to further explain the technology and assist with implementation. Follow-up meetings with growers adopting the VISS were held to further bed-down implementation. A range of written materials were also developed for publication in the WA Grower magazine which is distributed to every vegetable grower in Western Australia.

Extension of new technology with growers is a challenging process, particularly when it seeks to replace generations of traditional practice. Information transfer about implementing best practice between growers themselves is often poor. However, the experience of this project was that developing good stories about existing users to be used by an independent information source provided a useful basis for fostering further uptake, if those growers were willing to expose their results to the broader growing community.

There is still considerable work to be done in order to institute VISS as standard growing practice. However, the Western Australian vegetable industry has invested in achieving this beyond the scope of this project. A Field Extension Officer has been retained to continue extension efforts and Good Practice Demonstration sites on grower properties across all major Western Australian growing regions have been instituted. Amongst demonstration of other leading edge research and development outputs, these projects also incorporate demonstration of VISS.

For further information contact: John Shannon, Policy and Program Manager, vegetablesWA. 08 9481 0834, john.shannon@vegetableswa.com.au

Background

This project provided for the extension of the Vegetable Irrigation Scheduling System (VISS) to the vegetable industry. The VISS was developed for vegetable growers by the Department of Agriculture and Food of Western Australia (DAFWA), and uses evaporation rates automatically downloaded from local weather stations, plant growth factors and soil type to calculate the irrigation requirements of crops. The requirements are calculated and available via an online interface. A text message service from the system to the grower alerting them to daily evaporation rates was also incorprated.

Objectives

1. **Increase irrigation scheduling efficiency and water management through vegetable grower adoption of the Vegetable Irrigation Scheduling System (VISS).**

   The project enhanced irrigation scheduling efficiency through increased adoption of the VISS.

2. **Contribute to the sustainable management of groundwater resources on the Swan Coastal Plain in Western Australia.**

   Groundwater usage is a critical issue on the Swan Coastal Plain. More efficient water usage also decreases nutrient leaching which also contributes to this outcome. Improved efficiencies gained through the project have contributed to the sustainable management of the resource.

3. **Raise the water management skill level and knowledge of vegetable growers on the Swan Coastal Plain in WA.**

   Grower's knowledge and skills regarding water management have increased as a result of the project. In addition to the usage of VISS by 23 growers, 278 growers were engaged face-to-face to improve their water management knowledge and skills.

Methods

This technology extension project aimed to increase usage of the VISS by working with growers and water managers one-on-one to assist them implement this large practice change.

To provide this support, half the time of a Field Extension Officer was supplied.

A series of seminars and workshops were held with growers across a range of growing districts. These workshops aimed at increasing grower knowledge of improved irrigation practices with a particular emphasis on explaining the VISS and its benefits. These meetings were advertised through the vegetablesWA e-news, mail-outs and phone calls by the Field Extension Officer.

The first seminar was held in Bunbury on the 15th of October 2010 which was attended by 31 growers. A second seminar was held in Pemberton on the 18th of November 2010, which was attended by 11 growers. A third seminar was held in Manjimup, attended by 10 growers. A fourth seminar was held in Gingin on the 17th of February 2011 and was attended by 24. On the 3rd of March 2011 a session was held at Carnarvon in north of Perth which was attended by six. On the 16th of June 2011 a session was held at Manjimup in the South West which was attended by six growers. On the 6th of July 2011 a meeting was held with 15 growers from Palgurup. On the 14th of July 2011 a session was held at Wanneroo in the metropolitan zone which was attended by 23.

Growers who were interested in learning more about the system indicated their interest which formed a basis for follow up visits. Most of these growers have historically been early adopters of many new technologies. At these follow-up visits the VISS was demonstrated in much greater depth and an irrigation assessment completed along with system setup. Initial uptake was slow. The uptake rate was improved after more growers began to use the system and was demonstrated as successful.

The process when working with grower water managers is outlined below:

1. The Field Extension Officer undertook an initial irrigation system audit and uniformity (CU/DU) improvement to acceptable levels. As part of the one-on-one support provided to growers in using VISS, initial work was done to match sprinklers to their recommended pressure and checking to make sure there was even pressure in grower irrigation lines. Uniformity testing with catch-cans was then undertaken (Figure 1) and described as coefficient of uniformity (CU) and the distribution uniformity (DU).

Figure 1. Uniformity testing with catch cans

These values could also then be graphed to show a surface map of water applied (**Figure 2**).

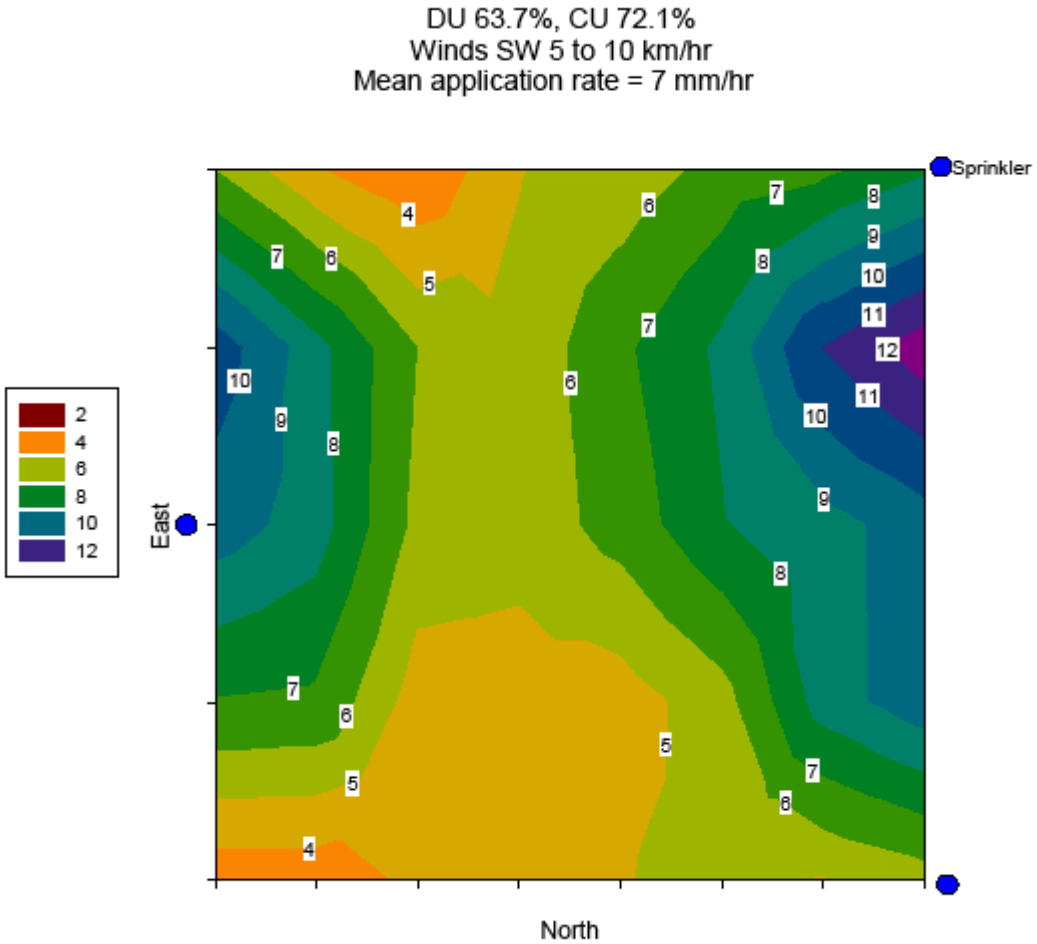


Figure 2. Surface map of water applied. The green colour represents the average application of water; the orange to red shows areas that receive less water and the blue colours show areas that are receiving more water than the average.

2. The VISS system is setup and customised for each grower's individual production details, including properties; soil type and assign weather stations. The Plant Growth option uses the designated region to calculate the length of growing period and crop factor stages. The Field Extension Officer created customised crop stage data if fine tuning was desired. The soil type was also customised to the relevant production system as soils are able to hold different amounts of water depending on their physical properties and organic matter content.

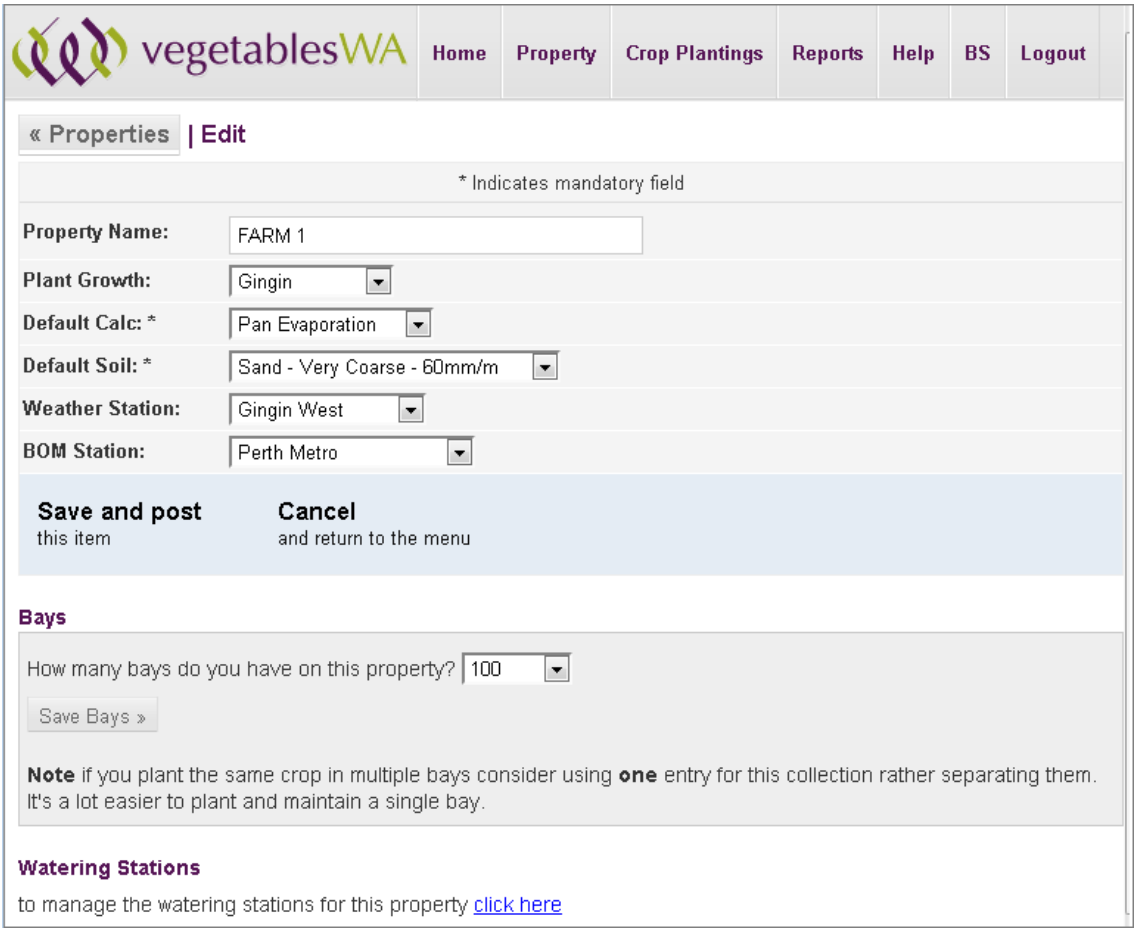


Figure 3. Property Editing

A further step on the Property tab was for the Field Extension Officer to work with growers to assign the number of bays that are on that property. A bay is usually defined as sprinkler line to sprinkler line. However, if certain bays are always planted together or have the same crop over a number of bays within an irrigation shift, they may be grouped. An example would be a carrot farmer planting 5 bays and irrigating those five bays together in one irrigation shift for the entire crop.

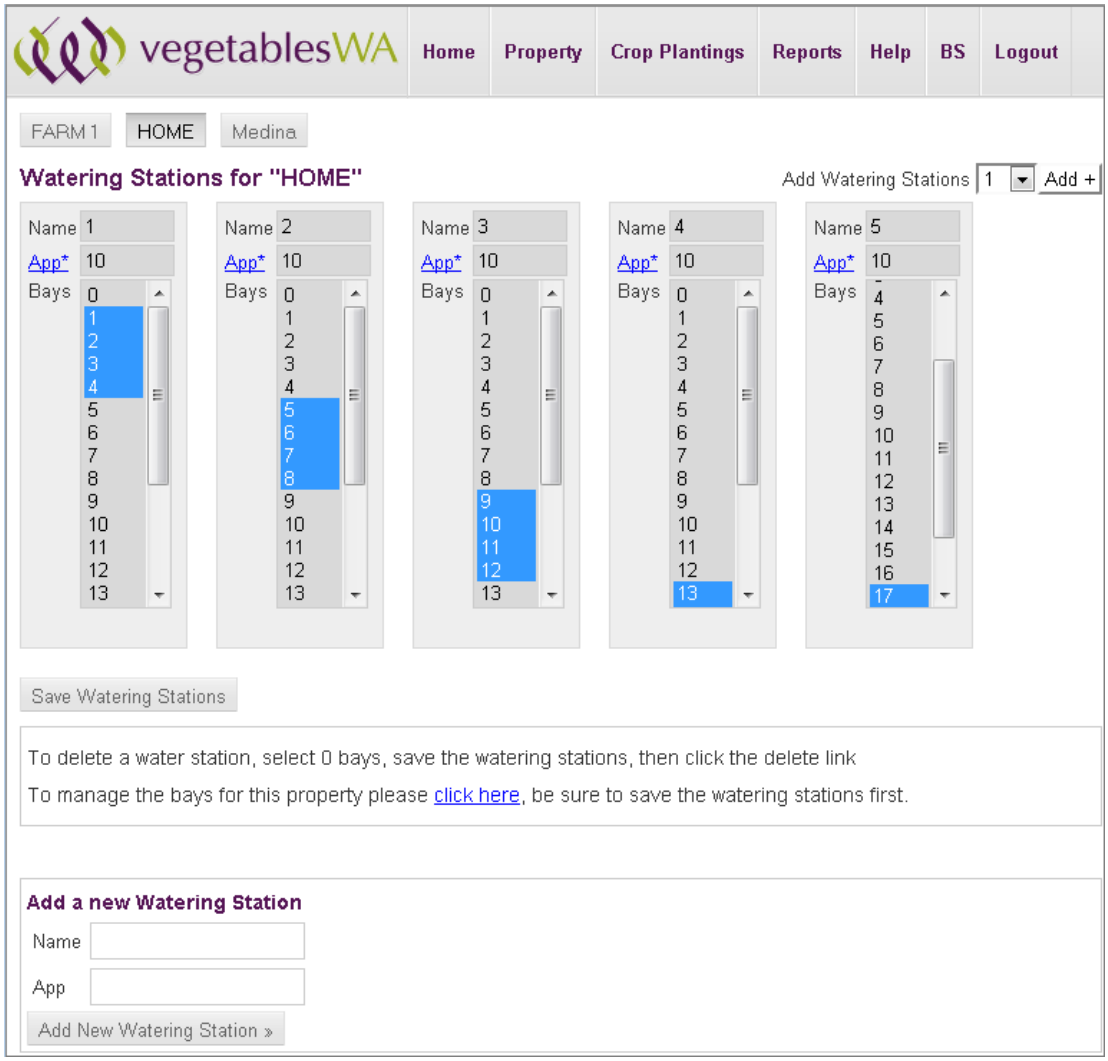


Figure 4. Setting up irrigation bays.

The Field Extension Officer then worked with the grower to setup the plantings in the system. VISS would then calculate the relevant irrigation requirement based on the local evaporation rate, soil type and crop growth factor.

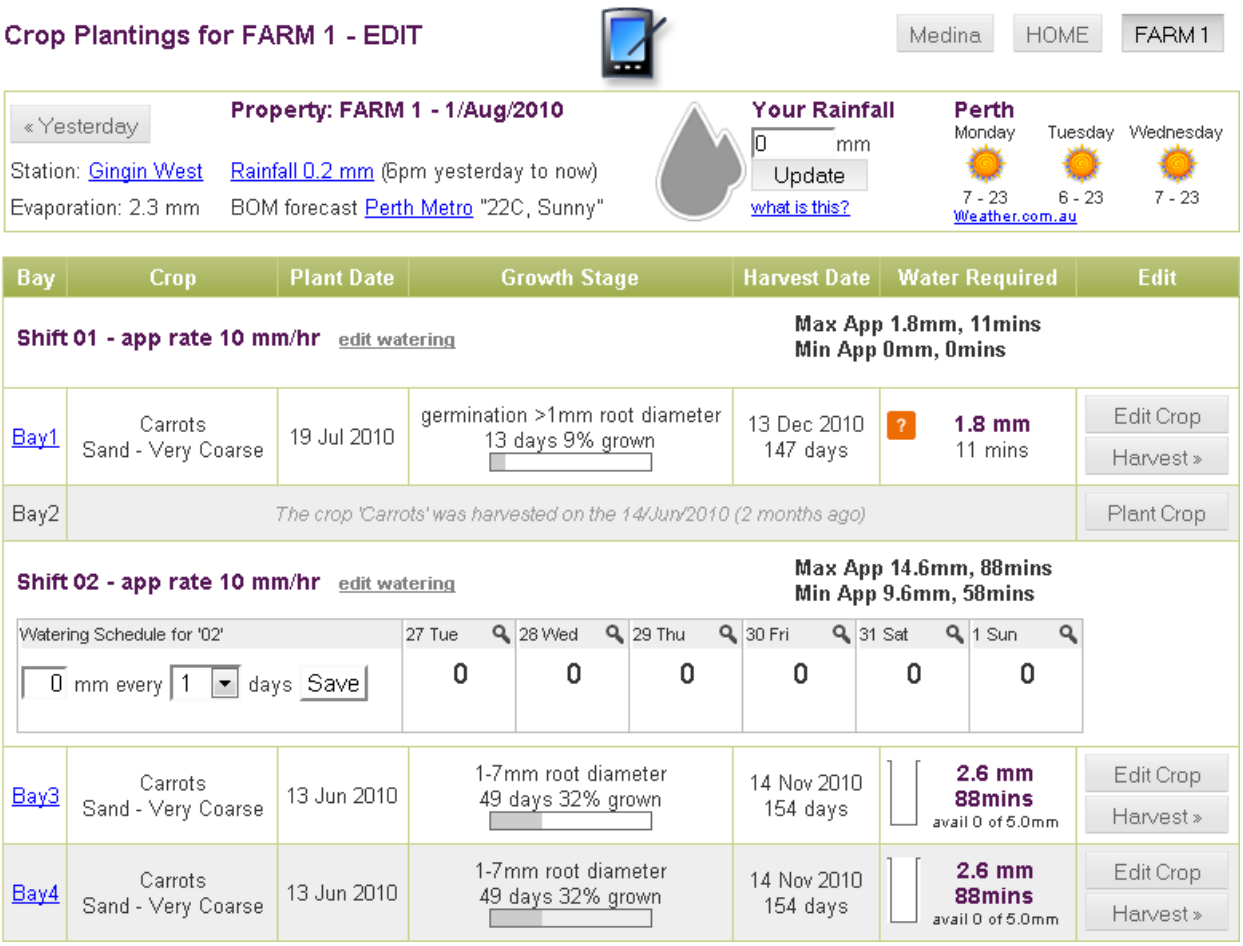
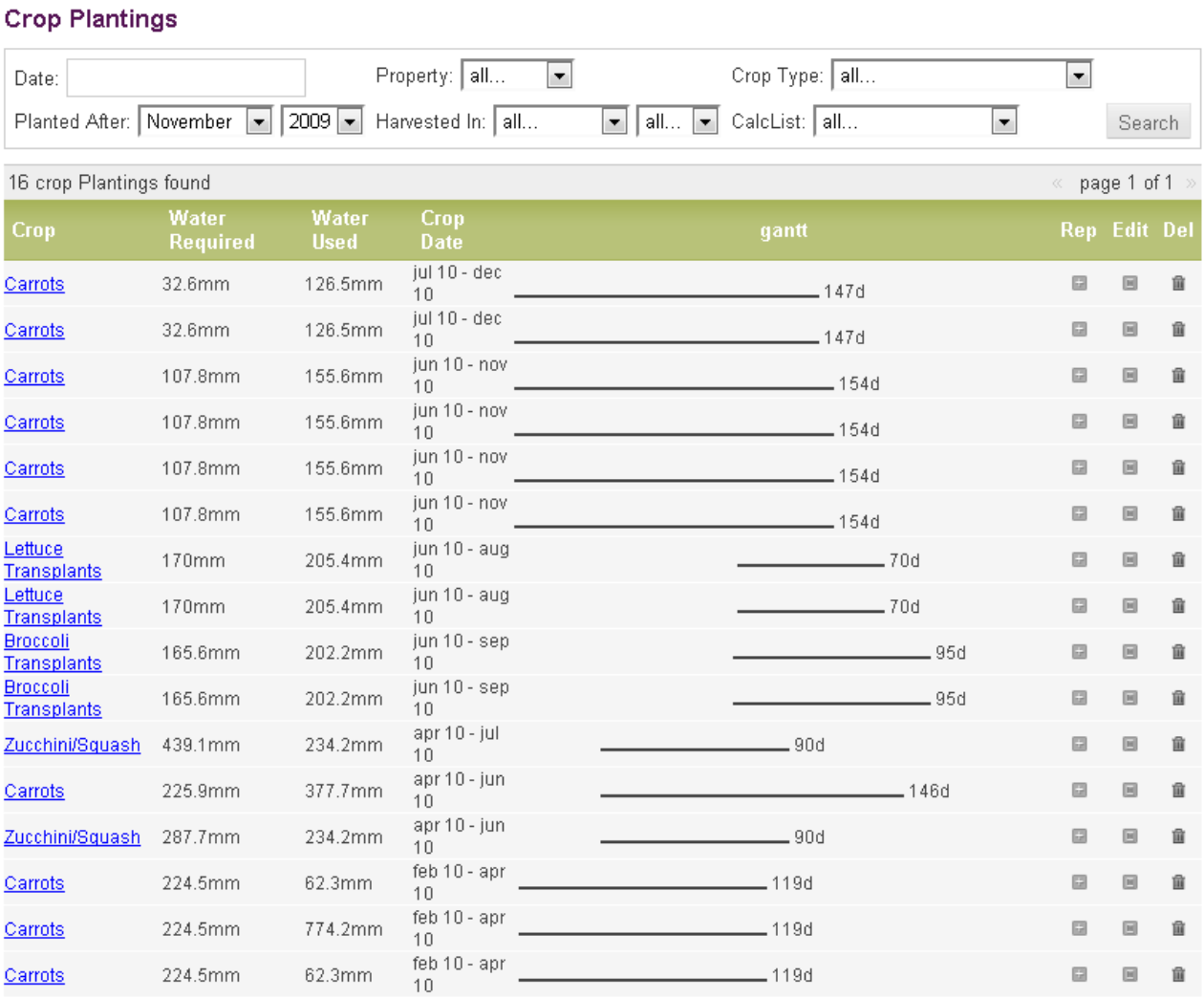


Figure 5. Crop watering

The Field Extension Officer also explained to growers how the VISS could be used to produce a number of useful reports. A feature of the reports page is a crop planting Gant chart which shows all the crops scheduled for planting and the expected harvest dates of these crops. This may be able to be used to determine continuity of supply of crops or labour requirements at particular times of the year.



Crop Plantings

Date: | Property: all... | Crop Type: all...
Planted After: November 2009 | Harvested In: all... all... | CalcList: all... | Search

16 crop Plantings found — page 1 of 1

Crop	Water Required	Water Used	Crop Date	gantt	Rep	Edit	Del
Carrots	32.6mm	126.5mm	jul 10 - dec 10	147d			
Carrots	32.6mm	126.5mm	jul 10 - dec 10	147d			
Carrots	107.8mm	155.6mm	jun 10 - nov 10	154d			
Carrots	107.8mm	155.6mm	jun 10 - nov 10	154d			
Carrots	107.8mm	155.6mm	jun 10 - nov 10	154d			
Carrots	107.8mm	155.6mm	jun 10 - nov 10	154d			
Lettuce Transplants	170mm	205.4mm	jun 10 - aug 10	70d			
Lettuce Transplants	170mm	205.4mm	jun 10 - aug 10	70d			
Broccoli Transplants	165.6mm	202.2mm	jun 10 - sep 10	95d			
Broccoli Transplants	165.6mm	202.2mm	jun 10 - sep 10	95d			
Zucchini/Squash	439.1mm	234.2mm	apr 10 - jul 10	90d			
Carrots	225.9mm	377.7mm	apr 10 - jun 10	146d			
Zucchini/Squash	287.7mm	234.2mm	apr 10 - jun 10	90d			
Carrots	224.5mm	62.3mm	feb 10 - apr 10	119d			
Carrots	224.5mm	774.2mm	feb 10 - apr 10	119d			
Carrots	224.5mm	62.3mm	feb 10 - apr 10	119d			

Figure 6. *Crop Planting Gant Chart*

3. The Field Extension Officer continued to liaise with the growers using the system to provide ongoing education and support until they had achieved competence and enough confidence to ensure ongoing adoption.

A range of written extension materials were developed as part of the project. These were distributed to all growers in Western Australia via the vegetablesWA *WA Grower* magazine. This information included technical explanations of how the system works, and as the project progressed a number of case studies on specific grower users were also developed.

Results

1. **Increase irrigation scheduling efficiency and water management through vegetable grower adoption of the Vegetable Irrigation Scheduling System (VISS).**

A total of 23 growers use VISS as a result of the project and uptake of the system has continued beyond the project timeframe. Larger scale growers were targeted by the project which leveraged the results when viewed on a total industry water use basis.

Unfortunately the exact volume of water use for the industry is not quantified and nor is the volume of individual grower's allocations readily available. However, data is available on the area devoted to vegetable production in Western Australia as well as the size of individual grower's properties who have taken up usage of VISS.

The Australian Bureau of Statistics (ABS) survey of 2009 indicates that there were 22,570 acres devoted to different lines of vegetable production in Western Australia. However, this figure should only provide a guide as it is likely to overstate the area by failing to account for a single area of land being worked in two or more rotations per year. For example, a common practice is to grow carrots, followed by potatoes after the carrots have been harvested. Dedicated carrot growers would also expect at least two crops from a given area in any one year.

As a result of the project we have 23 growers who have used VISS and operate over a combined 4,505 acres. Given the overestimation of ABS area data, we can conservatively deduce that this equates to 19.96% of the total land area. This area portion can in turn be assumed to be roughly correlated to the percentage of water used due to the Western Australian water rights environment. Consequently, it is estimated that these 23 growers control the management of approximately 20% of the water resources held by vegetable growers across Western Australia.

Interestingly, many of the very first adopters under the project were medium to smaller growers. It is possible that these growers are facing greater economic pressure to innovate.

Separate to this project, recent trials undertaken by the Department of Agriculture and Food of Western Australia (DAFWA) using VISS have recorded initial reductions in water use of 40% on irrigated tomatoes with the same or slightly improved quality and yield, compared to standard grower practice.

In line with this separate trial work, as expected, growers using the system generally report that they were previously over-irrigating their crops and by using VISS have increased their efficiency by reducing their water consumption. As this was an extension project rather than a trial project, the quantum of this efficiency increase was not compared to control plots or recorded.

The actual efficiency gains achieved across the industry are likely to vary considerably between crop type and growers. Efficiency through VISS can also be achieved in a number of ways which make calculating an overall efficiency measure very difficult. There has been a case where by using the VISS a grower has realised that previously they were under-watering their crops. In this example it is assumed that water use efficiency was also increased through using the VISS because plants were more productive by not suffering from mild moisture stress. This may have resulted in reduced days till harvest.

2. **Contribute to the sustainable management of groundwater resources on the Swan Coastal Plain in Western Australia.**

   More efficient irrigation management obviously leads also to more sustainable groundwater management. Adoption of VISS has therefore improved the management of groundwater in Western Australia.

   However, there is no publicly available information on the portion of water usage on the Swan Coastal Plain that is utilsed by vegetable growers. It is therefore difficult to calculate the scale of VISS usage's contribution to improved management of the overall quantity of the resource, even if more accurate efficiency measures were available for the growers now using the system and their combined water usage assumed.

   VISS usage also contributes to improved ground water quality. In the separate trial growing irrigated tomatos initial results indicate there has been a 43% reduction in nitrate leaching compared to standard grower practice.

3. **Raise the water management skill level and knowledge of vegetable growers on the Swan Coastal Plain in WA.**

   Grower's knowledge and skills regarding water management have increased as a result of the project. In addition to the usage of VISS by 23 growers, 278 growers were engaged face-to-face to improve their water management knowledge and skills. It is anticipated.

Outcomes

1. **Improved vegetable industry irrigation knowledge**

   The project outputs contributed to this outcome through the information transfer achieved through the range of workshops conducted with growers and the one-on-one support provided. A total of 278 growers received face-to-face information to improve their irrigation knowledge. Associated extension activities such as information provided in the WA Grower magazine also contributed to this outcome and reached all vegetable growers in Western Australia.

   There were no technical advances achieved, other information developed or changes to the intellectual property register associated with this outcome.

2. **Increased adoption of weather-based irrigation scheduling**

   The project outputs contributed to this outcome through the resulting increase in grower numbers using the Vegetable Irrigation Scheduling System. A total of 23 growers adopted weather based scheduling as a result of the project. These growers constitute approximately 20% of the Western Australian vegetable production area.

There were no technical advances achieved, other information developed or changes to the intellectual property register associated with this outcome.

3. **Improved management of groundwater resource**

The project outputs contributed to this outcome through the inference that greater water use efficiency is achieved through VISS adoption. As a result a more optimal amount is drawn from the aquifer and leaching of water and nutrients back to the aquifer as a result of over-watering is reduced. It not possible to possible to accurately quantify the project's achievement against this outcome.

There were no technical advances achieved, other information developed or changes to the intellectual property register associated with this outcome.

4. **Improved water use scheduling efficiency for WA vegetable growers through adoption of VISS**

The project outputs contributed to this outcome through the resulting increase in grower numbers using the Vegetable Irrigation Scheduling System. A total of 23 growers adopted weather based scheduling as a result of the project. These growers constitute approximately 20% of the Western Australian vegetable production area.

There were no technical advances achieved, other information developed or changes to the intellectual property register associated with this outcome.

Conclusion

This technology extension project has improved the water use efficiency of a fair potion of the Western Australian vegetable industry, although these results cannot be specifically quantified.

Extension of new technology with growers is a challenging process, particularly when it seeks to replace generations of practice. Grower feedback consistently shows that they prefer face-to-face information transfer and continuing support for implementation from an independent provider. Information transfer about implementing best practice between growers themselves is often poor. However, the experience of this project was that developing good stories about existing users provided a useful basis for fostering further uptake, if those growers were willing to expose their results to the broader growing community.

The VISS was highlighted at the 2011 nation vegetable industry convention as a leading edge technology. The original developer of VISS from the Department of Agriculture and Food, Rohan Prince, was awarded the prestigious Industry Impact

Award at the national awards for excellence. This award recognised the impact of his work in developing the VISS and other projects.

Extension Opportunities

The VISS will be the focus of considerable ongoing extension efforts following the conclusion of the project. vegetablesWA has continued to employ a Field Extension Officer following the completion of the project. This resource will continue the extension and support work for the VISS with growers.

In addition, since the commencement of this project vegetablesWA has initiated formal Good Practice Demonstration projects which now cover all the key growing regions of Western Australia: Carnarvon, the South West and the Metropolitan zone. Associated field days and on-farm workshops will provide a valuable ongoing extension tool. Amongst demonstration of other leading edge R&D, these projects also incorporate demonstration of VISS. These projects are all three year projects and so extension of the VISS will continue well beyond the term of this Upskilling Water Managers project.

vegetablesWA is also in discussion with the Western Australian government to allow a further upgrade VISS so it may be extended across other irrigated horticulture industries such as fruit and wine grapes. This work would feature an extension component across other industries.

8. A. Publications arising from the research project

As this is an extension project and not a research project, there will be no academic papers developed for scientific journals.

B. Online resources

The Vegetable Irrigation Scheduling System can be found on the main page of the vegetablesWA website, www.vegetableswa.com.au

Appendix

$19.00 + GST

WA Grower

vegetablesWA

Potato Growers Association Inc.

WESTERN POTATOES

APC-VPC
APC-PPC
Agricultural Produce Commission

SINCE 1948
Vol. 46 No 1. March 2011

VISS takes off

WA export edition

LANDMARK
finance insurance real estate wool farm services livestock fertiliser merchandise look to us

VISS continues to gain momentum

BY CHARLOTTE BUTLER
VEGETABLESWA

Since the launch of the updated version of VISS in September 2010 we have been collecting valuable feedback, enabling us to continue to fine tune the program to better suit the needs of growers.

The free, web based computer system uses real time weather data and crop factors to calculate a minimum and maximum recommended daily irrigation requirement for a variety of vegetable crops. This enables growers to match, the amount of water they supply their crops with the amount of water demanded, therefore improving irrigation scheduling efficiency and water management.

Currently vegetablesWA provides a sms service that sends evaporation rates and daily forecast from the closest weather station and BOM station in a text to grower's mobile phones. Many growers using this sms service find the information invaluable as it enables them to plan their irrigation scheduling for the day.

The VISS system is an extension of this service allowing for more specific information to be used to calculate an irrigation application rate. vegetablesWA, in partnership with DAFWA, is currently developing the sms service to be updated to include the irrigation recommendations provided by the VISS program.

Case study

Grower currently using the VISS program

Since October 2010, Aaron Natoli, of Natoli Produce Farms, has been using the VISS program as a resource to guide his decisions on daily irrigation scheduling. First thing in the morning Aaron logs into the system to check the previous day's evaporation rate and interprets the forecast for the day.

"This is a fantastic guide to making decisions about how to plan the irrigation scheduling for the day," says Aaron.

The capability of the system to produce a visual comparison of how different the water requirements are for various crops has also been a useful feature of the program.

In addition, Aaron has been able to make comparisons of the seasonal change in evaporation rates, and as a result has made adjustments to bring their irrigation in line with these changes.

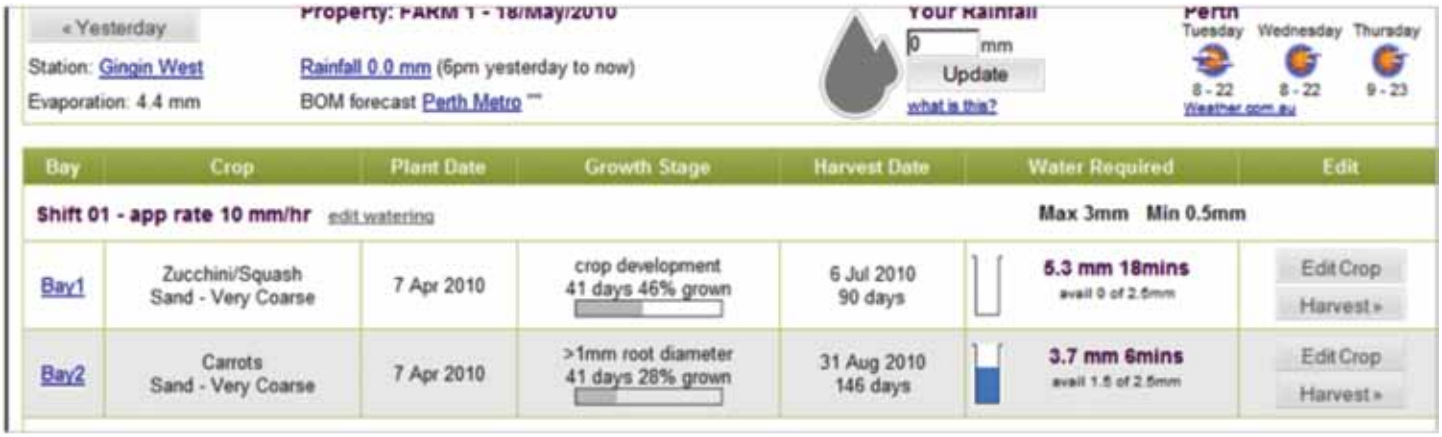
Another note worthy feature of the system had been the ability to predict the timing of maturity of crops. This allows Aaron to plan exactly when and what he can supply to his customers, as well as, what his labour requirements will be at different stages of the season. This visual planning feature has also greatly enhanced his ability to plan the rotations of their different crops. This is due to the fact that the system allows you to track exactly what you have grown in each bed on your property.

At Natoli Produce Farms they grow a number of fairly specialised lines which were not initially available in the program. Through the use of the system's feature that allows growers to edit the crop factors, Aaron has been able to create their own crop factors for the specific crops they grow.

Figure 1 Crop planting Gant chart which shows all the crops scheduled for planting and the expected harvest dates

Catch cans setup in beds of parsley, at Natoli Produce Farms, to assess distribution uniformity of sprinkler system.

Figure 2 Minimum and maximum irrigation recommendation shown in crop planting page of program



On farm set-up

To use the VISS, growers will be assisted in setting up their property details in the software through an on farm visit. The setup time usually requires about an hour to go through entering the details of your property and explaining the different features of the program. As part of the setup process vegetablesWA offers an assessment of your irrigation system.

Your irrigation system is a vital part of your business and getting to know its current performance and limitations may assist you to maximise production, reduce pumping and fertiliser costs and manage your limited water resources.

Irrigation assessment

The irrigation assessment involves collecting vital data about application rates, distribution uniformity, flow rates and sprinkler pressure. Application rates can be calculated by placing catch cups between the sprinklers and recording what is collected in the cups in millimetres per hour. The application rate can be entered into the VISS program and is used to schedule irrigations to the crop requirements, based on how your system operates.

Distribution Uniformity (DU) indicates how evenly the water is applied to your crop and it is important to improve your DU if it is lower than 75%. A system with a DU of 65%, generally, requires an extra 30% more water, than a system with a DU of 80%. Incorrect sprinkler pressure and flow rates are common causes of system inefficiency. It is important to run your system at the designed pressure. Operating pressure can dramatically affect the sprinklers/emitter wetting pattern and output and therefore the efficiency of the irrigation system.

I look forward to continuing to assist growers in adopting such an innovative tool for daily use on their property. After the initial irrigation assessment and VISS setup, I will continue to provide ongoing support, as well as, collecting valuable feedback to continue to develop this program to suit growers across the state.

FOR MORE INFORMATION ▶

If you have any questions or queries please do not hesitate to contact me on 0427 373 037 or email at charlotte.butler@vegetableswa.com.au.

Sharing the knowledge on irrigation

BY JOHN SHANNON
VEGETABLESWA

vegetablesWA teamed up with the NSW Irrigators' Council to organise a presentation from four leading-edge Eastern states irrigators who discussed their experiences and successes. Growers also heard more about the vegetablesWA Vegetable Irrigation Scheduling System (VISS).

Although some presenters were from very different irrigating systems to that of the Swan coastal plain, growers reported that they gained some useful ideas that could be adapted to our conditions.

Whilst more information on the VISS is provided in the article on Page 14, here are some key points from the presenters organised by the NSW Irrigators' Council:

Richard Wheaton, Tailem Bend, SA — Humidity manipulation on irrigated onions

This involved the use of The Phytech system which offers an integrated approach to on-farm water monitoring.

A typical system comprises of:

- Air temperature / relative humidity sensor
- Stem diameter sensor
- Soil moisture sensor
- Fruit (bulb) growth sensor
- Portable concentrator
- PC based software.

The system achieves the following:

- In-canopy climate sensors monitor plant disease pressure
- Fruit growth sensor tracks bulb development
- Soil moisture data verifies the effectiveness of the associated irrigation scheduling regimes
- Data easily collected & downloaded
- Reducing water usage while increasing production.

Productivity was improved by irrigating to increase humidity levels.

Ray Sellwood, Undera, Vic — farming with sub-surface drip irrigation

This initially started with growing processing tomatoes, progressed to Lucerne and now used on numerous other crops as well as grazing stock.

Discussed:

- Cultivation
- Bed forming
- Application of fertilizers through system
- Water control (runoff back to rivers / streams)
- Better control over soil profile.

Negatives:

- Capital cost $5,500 to $9,000 per hectare
- Lack of technical support
- Lack of education
- Root intrusion
- Rodent and insect damage
- Lack of incentives for drip compared to flood.

Positives:

- 50 per cent to 75% increase in productivity per millilitre
- Allowing irrigated agriculture on un-commandable prime land
- Laser grading — significant reductions in the amount of 'cut and fill'
- Irrigate to the risk of weather (reducing irrigation time)
- More precise irrigation applications
- Eliminate channel maintenance
- Ability to increase area under crop production with existing labour resources.

Components include:

- Motor and pump / filters / mains (PVC) / sub mains (PVC) / tape / valves
- Controllers (automation and back flushing).

Brad and Krysteen McElroy, Padthaway, SA — fast flow (surge) irrigation.

Using Padman stops to control time and volume of water applied to bays. Involved channel reconstruction, new bays and monitors and controllers

Growing Phalaris for feed on shallow dark clays over limestone.

Discussed:

- 2007 (prior to surge irrigation) took 90 –150 hrs pumping time to irrigate 18ha — 4.8–3.6mL/ha water pumped
- Yield 400kg/ha seed
- 65% germination
- Bays are 30 metres wide and 350–450m long.

Aim of changing:

- Not subject plant and soil to water logging
- Allow for better growth and seed set
- Achieve a higher flow rate
- Get over the ground quicker.

Discussed:

- 2009 (after work completed) took 43 hours pumping time to irrigate 18ha — 2–1.5mL/ha water pumped
- Yield 600kg/ha seed (33% increase)
- 85% germination (20% increase).

Presenters inspecting the irrigation setup at Loose Leaf Lettuce.

Michael Murray, Moree, NSW — improving irrigation efficiency in the Australian cotton industry

An on-farm side-by-side comparison of furrow (86.7ha), bankless channel (33.2ha), drip (11.7ha) and lateral move (124ha)

Purpose of the program:

- To improve the irrigation efficiency of the Australian cotton industry by 10%
- Approximately $500,000 of funding, project originally to have concluded in December, 2010, now extended to April, 2012
- Irrigators showing irrigators
- Focus on improving efficiency of furrow irrigation
- Reducing losses from on-farm storages.

Approach:

- To eliminate as many variables in management and physical location of the different systems so as to assess the effectiveness of the system for accurate comparison
- Soil
- Rain
- By increasing the measured area minor growth variations have less impact on the overall results
- Same team used across the four systems and in direct consultation.

Drip system:

- 1.5m spacing
- 36 centimetres deep
- 11.7ha
- $6,000–$9,000/ha
- Yield — 1.3 bales per mL.

Lateral move:

- 124ha
- 3m beds
- 30 inch plant spacing
- $1,800–$3,000/ha
- Yield — 1.28 bales/mL.

Bankless channel:

- 33.2ha
- 30" plant spacing
- Yield — 1.12 bales/mL.

Furrow:

- 86.7ha
- 30" plant spacing
- Yield — 1.27 bales/mL.

vegetablesWA thanks the NSW Irrigators' Council for bringing these speakers to the West and the Dobra family for providing their home at Gingin as a venue. The presenters from the East were also able to learn from the techniques employed by Loose Leaf Lettuce in the West. Harvey Irrigation also hosted a second presentation night which included a visit to a Capogreco family's BJ Melons at Hamel.

FOR MORE INFORMATION ▶

For further information on the presentations, please contact Mark Moore from the NSW Irrigators' Council on (02) 9251 8466 or at mark@nswic.org.au.

The vegetablesWA Field Extension Officer

a vital service for WA growers

BY CHARLOTTE BUTLER
VEGETABLESWA

As Field Extension Officer at vegetablesWA, every day presents a new and exciting challenge. Whether it is sitting down with a grower to set them up with the Vegetable Irrigation Scheduling System (VISS) or digging up soil samples to be sent off for testing, there is never a dull moment.

Dealing with a range of queries from growers including; production methods, irrigation, varietal choices, pest and disease management, chemical use and accessing labour sources, the role involves continually assisting growers. A major part of this involves dealing with numerous people allied to our industry, including government and other service providers.

As part of the extension work for the VISS project, I have been conducting basic assessments of grower's irrigation systems and have discovered some interesting results along the way. In many of the metro areas growers have turned to leasing additional land to cater for the increase in demand from their customers. Many of these leased properties have different irrigation setups and this can lead to inefficiencies for growers if both systems are treated the same. In many of the assessments conducted on homestead and leased properties there have been some significant differences found for the grower to learn about and profit from.

Possibly the most important aspect in the role is the face to face contact with a grower on their property. This ongoing contact is critical in building trust, which then enables vegetablesWA to better identify individuals needs and how best to service them. For example, in Geraldton I had an enquiry about trialling some Asian vegetables and where to source the seed. Upon contacting a researcher in NSW, who was in fact looking at running some trials, they were more than happy to send some seeds to an enthusiastic grower, who was delighted to have the opportunity to see if the growing conditions were right for commercial production.

This relationship building enables me to target particular grower groups, ensuring they are made aware of upcoming events or newly released information that relates to their crop, region or business.

This is an essential element for the successful adoption of new production methods or technology, as well as encouraging participation in development programs for growers.

In addition to the face to face discussions with growers, participating in grower meetings also enables vegetablesWA to gather important feedback, identify further research needs as well as passing on important information to those not present.

Through the ongoing contact with growers the Field Extension Officer has become a first point of contact for grower's enquiries. Having someone that they feel you can talk to about any problems you are facing is a great way to ensure vegetablesWA continues to service the needs of growers. If you have an issue I encourage you to make contact too. It is all part of the help provided to growers through the APC Fee for Service.

Vince Cavallaro

VISS user profile

Grower profile

Name Vince and Margaret Cavallaro

Location Karnup

Property size 2.6ha

Enterprises Spring onions

BY HAYLEY WILSON
VEGETABLESWA

Vince Cavallaro and his wife Margaret have been on their six and a half acre property in Karnup since 2001. They specialise in growing quality spring onions all year round.

Vince's father, Peter, originally was a grower also growing pumpkins, beans, potatoes and swedes in Waroona. Although his father got out of the industry in the 1970s when Vince was very young, he had already had a taste of the growing lifestyle.

After working in a fertiliser factory as a labourer for 13 years, Vince and his wife Margaret established a market garden in Wattleup in 1992 in which Vince worked on part time whilst still working as a labourer. In this time they grew a number of different crops such as spring onions, silverbeet, parsley and also Chinese vegetables for a while.

In 2001 they moved to their property in Karnup after taking 12 months to establish the land to make it suitable for vegetable production as the property had been cleared 50 years beforehand and previously had horses on it.

The Cavallaros decided to specialise in growing spring onions as Vince said, "It's better to concentrate on one line and do it properly and we could afford to do it like this." They were presented with an opportunity from Coles to grow spring onions specifically for them. Vince said, "We are limited to what we can grow in the area of land we have, you have to grow crops that gives you value per area, so we are restricted to small lines."

Vince says the disadvantage of being situated in Karnup is there is no opportunity to expand their property due to the suburban sprawl and the land being too expensive. He also said, "Obtaining water licenses is a nightmare."

Charlotte Butler, vegetablesWA Field Extension Officer, has been working with Vince using the VISS system. He has found it has improved his growing as since using the system he has realised he was under watering before. Vince said, "If watering to more demand of the plant, it will increase the shelf life of the produce". He is also hoping that in the upcoming summer months, using VISS to water more effectively will stop yellowing of the plant.

Vince had mobile broadband setup to enable him to have the computer at his shed connected to the internet. This means Vince can login to the VISS every morning to check what the irrigation requirements are for that day.

The Cavallaros grow their spring onions all year round and plant on a regular basis. The crops are all picked by hand by Vince, Margaret and their two full time workers. Vince says, "I work out roughly what we need to pick for a week then work around the weather." Vince said that the weather can always be a problem but can always over come; you just need to work out ways to get around it. He also said, "You can have more than one problem targeting you at once, you just need to pin point which is the most volatile one and work on it."

Vince said that there is a lot more paperwork and restrictions now days and keeping track of chemical restrictions and minor use permits is a bit harder.

Producing the highest quality product possible rather than a high volume is always Vince's focus. He said that there isn't any more time to spend on producing higher yields and attempting to do so would only prove detrimental to the quality of their produce.

Vince says he loves the freedom of being a grower and being able to choose and determine what you do.

When Vince isn't busy growing his spring onions he enjoys driving his HR Holden ute that he has recently had restored. Vince said, " I grew up in and around cars like this and it holds lots of memories for me, driving a car like this gives you the feeling you're stepping back in time, which can be a great feeling."Vince plans on growing long into the future as long as he is capable and will continue focusing on producing solely quality spring onions.

Tomato irrigation trial gears up for 2011–12 season

ROHAN PRINCE
DEVELOPMENT OFFICER, DEPARTMENT OF AGRICULTURE AND FOOD, WESTERN AUSTRALIA

Carabooda tomato grower George Kyme has kindly offered a site on his Bernard Road North property this season for trials to continue to develop good practice for drip-irrigated tomatoes.

Conveniently located next to the WesGrowers packing facility, the site is easily accessible and will host regular open days for growers dropping off their fruit for grading next door to have a look at the progress of the trial.

This year's trial will compare scheduling using evaporation and crop factors adjusted by soil moisture monitoring to fine-tune irrigation to suit the site. Drainage will be monitored using catch lysimeters. Yield and quality will be monitored by harvesting and grading fruit from the two areas separately.

Last season's trial at Medina compared five different levels of drip irrigation and found that yields were similar to the grower control treatment when as much as 40% less water and as much as 50% less nutrients were applied. Obviously this was not on a commercial scale or farm, so testing in a real growing situation is important to validate this result.

This season irrigation and fertigation will be run independently from the same water source for about 4,000 Swanson plants which will be trained, tied and pruned by George's workers, the same as the rest of the crop.

By running this trial on a commercial property it is hoped that some of the husbandry issues that occurred at the isolated trial site at Medina Research Station can be overcome and higher fruit yield may be achieved to really test the water requirements of plants under commercial load.

George said it was important for industry to support this work when such large pressure is being placed on industry to demonstrate efficient water use.

"Efficiency is not just about the amount of water being applied to a crop, but the amount of produce grown from that water," he commented.

The tomato crop should be planted in late October. If you are interested in seeing its progress, look for the signs near the packing shed directing you to the trial site and drop in for a look.

MORE INFORMATION ▶

If you would like a tour please contact me, Rohan Prince, and I can meet you there. Any questions please phone 0429 680 069 or email rohan.prince@agric.wa.gov.au.

This is the final year of the APC/VPC and HAL-funded project, so make the most of the opportunity to have some input and make sure you are getting value from your levy contributions.

See you at the site!

HAL Know-how for Horticulture™

Agricultural Produce Commission

Positive feedback

for Vegetable Irrigation Scheduling Software (VISS)

BY CHARLOTTE BUTLER
VEGETABLESWA

Positive response received from growers who have adopted the Vegetable Irrigation Scheduling Software (VISS). As we continue to roll out the updated version of the VISS, through group sessions as well as one on one farm visits, we are gathering valuable feedback from growers who have adopted the software program.

The free, web based computer program uses real time weather data and crop factors such as growth stage to calculate daily water requirements for vegetable crops.

Adequate quantities of quality water for irrigating crops remains one of the critical issues growers are facing statewide. The solution relies, primarily, on increasing the efficiency of water usage rather than relying on further allocation of scarce water resources.

One of the main benefits being communicated by growers is the ability to tailor the VISS to the specific characteristics of each individual property. This includes, not only the key aspects such as soil type, crop and region specific weather data, but goes even further enabling growers to edit the specific crop requirements. This enables the system to cater for varietal or regional differences in the water requirements at critical growth stages and the duration of these stages. The crop stages are setup to allow easy copying of system data which can then be edited.

To begin with, search for an existing crop stage that you want to modify, once you have found this, press the 'copy' link to start editing.

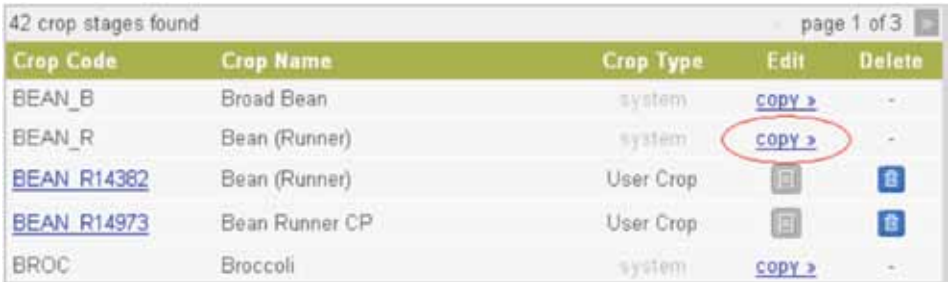
An additional benefit from using the Vegetables Irrigation Scheduling System are up to date records such as rainfall and water usage which can be readily accessed and used to make comparisons and predictions about future plantings.

The continued delivery of this program will include ongoing introductory group presentations to growers to promote the implementation of the VISS. After success in Bunbury, Manjimup and Pemberton, additional sessions for north and south metro areas as well as greater northern growing regions are planned for early next year. Details will be made available to growers as they are confirmed.

FOR MORE INFORMATION ▸

Ongoing farm visits offering one on one setup of the VISS are readily available so please contact myself or horticulture house to register your interest. If you have any questions or queries please do not hesitate to call me on 0427 373 037 or email at charlotte.butler@vegetableswa.com.au

Figure 1 Crop stage manager



42 crop stages found — page 1 of 3

Crop Code	Crop Name	Crop Type	Edit	Delete
BEAN_B	Broad Bean	system	copy »	-
BEAN_R	Bean (Runner)	system	copy »	-
BEAN_R14382	Bean (Runner)	User Crop		
BEAN_R14973	Bean Runner CP	User Crop		
BROC	Broccoli	system	copy »	-

Figure 2 Graph of irrigation scheduling to allow for easy comparison with future plantings

New version Vegetable Irrigation Scheduling System (VISS)

CHARLOTTE BUTLER
BY VEGETABLES WA

vegetablesWA is pleased to launch the new version of the Vegetables Irrigation Scheduling System (VISS) to assist growers to increase their water use efficiency. The free, web based computer system matches irrigation scheduling to the amount of water required by various vegetable crops. It does this by using real time weather data and crop factors such as growth stage to calculate daily water requirements for vegetable crops, improving irrigation scheduling efficiency and water management.

This updated version of VISS has been developed, in partnership with DAFWA, to include a wider range of farm specific factors to increase the accuracy of the program.

The system enables growers to enter data relating to their property such as soil type and crops planted. This information combined with the real time weather conditions allows the software to calculate the daily water requirement for each crop grown on the property. The grower is then able to make the required adjustments to their irrigation regime to align with the crop daily needs therefore reducing the likelihood of over or under watering. Growers are able to setup several properties at different locations as shown in Figure 1.

To use the VISS, growers will be assisted in setting up their property details in the software, which will enable them to see the results produced by the software and make the recommended adjustments to their irrigation schedule. In the near future, it is hoped, that the VISS will incorporate a system, by which, growers receive a daily text message with the specific irrigation requirements for each watering bay, which then enables them to make the modification to their irrigation regime.

Adopting this innovative tool, will allow growers fine tune their irrigation system so as to operate at optimum performance, ensuring efficient water use and achieve high yields of quality produce.

Efficient water usage is not necessarily about using less water but, rather, about tailoring the amount of water supplied to the amount required by each crop and each stage of growth. The result is a healthier plant as they are less likely to come under stress from too little water or leaching of nutrients from too much water. Healthier plants mean they are less susceptible to disease and are more likely to generate a high yield of quality produce.

An additional benefit from using the Vegetables Irrigation Scheduling System are up to date records such as rainfall and water usage which can be readily accessed and used to make comparisons and predictions about

FIGURE 1: PROPERTY MANAGER PAGE OF VISS SOFTWARE

future plantings. The VISS software allows growers to enter rainfall measurements taken from their properties (Figure 2: VISS page showing 'Your Rainfall' tab) as well as the ability to graph and compare past and present water usage for accurate water resource accounting.

With the ever increasing pressure on water availability set to only continue to grow and potentially lead to water monitoring requirements making this type of record keeping an essential tool for growers.

Other positive outcomes from the adoption of VISS include more efficient use of valuable ground water resources and reduced nutrient loss to ground water aquifers. These outcomes are becoming ever more valuable as water resources are increasingly under pressure from multiple users, as evident on the Gnangara Mound to the north of Perth and on the Swan Coastal Plain.

The delivery of this program will include a number of introductory group presentations to growers to promote the implementation of the Vegetables Irrigation Scheduling System. **The first of these will be presented by Rohan Prince at the Potato Industry meeting held in Bunbury at the Quality Lord Forrest Hotel on the 15th of October.** Details of other introductory sessions will be made available to growers as they are organised.

Following up on the introductory sessions on the VISS software program a one on one session will be organised for system establishment. This involves the collection of individual property data including assessment of application rates, farm soil mapping and a review of relevant crop factors, followed by the initialization of the system through entry of the data collected and daily operation training. The ongoing management and maintenance of the system will include aspects such as soil moisture monitoring and irrigation fine tuning. Additionally, a system review can be conducted to assess irrigation and production output improvements as well as a water and energy performance evaluation.

I look forward to being able to assist growers in adopting such an innovative tool for daily use on their property as well as providing ongoing support and collecting valuable feedback.

FOR MORE INFORMATION ▸

If you have any questions or queries please do not hesitate to contact me on **0427 373 037** or email at **charlotte.butler@vegetableswa.com.au**

FIGURE 2: VISS SOFTWARE PAGE DISPLAYING TAB WHICH ENABLES GROWERS TO ENTER RAINFALL MEASUREMENTS FROM THEIR OWN PROPERTIES

vegetablesWA – working for growers

BY GEORGIA THOMAS
VEGETABLESWA

The first half of 2010 has been a very busy one for the team at Horticulture House. In order to provide the best range of services and information for growers, the team have been researching and developing long term strategies, liaising with key stakeholders and applying for funds to assist us to reach industry goals.

In facilitating planning for the future, it is of critical importance that the vegetablesWA team understands the day to day concerns of our members. As such, John Shannon our Field/Extension Officer has conducted extensive interviews with growers in the last 6 months and identified the following areas of focus:

- Water planning and use
- Certification/Auditing and quality assurance
- Marketing and promotion
- Communication/lobbying outcomes
- Standardised grading
- Chemical regulation
- Development application assistance
- Labour availability
- Input costs
- Business skills and risk management
- Climate change

In order to address these grower issues and meet long term industry goals the team has identified a range of projects and activities. The activities will link issues and goals with real activities to create practical outcomes for growers.

A summary of current and proposed activities are listed below:

Activity: Communication Innovation Project (2009/10)

The Communication Innovation Project aims to improve overall communications between vegetablesWA and members. The project will investigate the most advanced methods of communication available and determine the best mix of techniques to reach the largest group of growers in WA.

Project Manager:
John Shannon (Field/Extension Officer)

Completion Date: June 30th 2010

Funding: APC VPC

Activity: Marketing and Promotion Project (2009/10)

This is primarily a capacity building project to develop a targeted strategy for marketing and promotion of WA vegetables. The project will provide a desktop study of existing campaigns, a consumer preferences study, a study linking wine and vegetables and finally a strategy listing recommendations for vegetablesWA. There are also some promotional activities included in the 2009-10 project such as advertising, development of materials (such as banners and fliers), and participation in events.

The 2010/11 marketing and promotion project will be determined by the recommendations from the 2009/10 capacity building project.

Project Manager:
Georgia Thomas (Program Manager)

Deadline: June 30th 2010

Funding: APC VPC and Promoting Australian Produce (Federal)

vegetablesWA's strategic plan identifies 5 major goals that are:

1. **Consumers** — facilitating better interaction between consumers and industry
2. **Markets** — maintaining and building domestic and international markets
3. **Competitiveness** — ensuring profitable, competitive and sustainable business
4. **Information** — delivering information for better business decisions
5. **Leadership** — building industry capability through leadership development and training.

Activity: Field/Extension Officer (John Shannon)

The Field/Extension Officer role has been developed to ensure close two way communication between vegetablesWA and its members. The Field/Extension Officer provides a service to growers by being on the ground and in the field. Additionally, all of the intelligence gathered is returned to the office to ensure that the organisation is aligned to member needs. The Field/Extension Officer is in an ideal position to lead relevant projects and provide essential feedback to the office.

Line Manager:
Georgia Thomas (Program Manager)

Deadline: Ongoing

Funding: APC VPC and Projects

Activity: Grower Representation and Advocacy

This activity addresses the need for WA growers to be considered in all relevant Local, State and National Government forums for matters such as water use, land use planning, chemical use, environmental issues and many others. Through this activity vegetablesWA aims to consider and respond to all relevant issues through channels such as public forum, written submissions or lobbying the government directly.

Grower Liaison: Jim Turley (Executive Officer vegetablesWA)

Deadline: Ongoing

Funding: vWA

Activity: Communications

vegetablesWA's Communications activities enables the streamlining and coordination of communications from the office. The WA Grower magazine, E-news, Committee correspondence and grower liaison activities all form part of the strategy. The aim is to provide a useful mix of communication to give members the best opportunity to receive relevant and timely information. The Communications Innovation project will assist in refining this strategy once complete.

The vWA grower database is also an integral part of Communications as success relies on up to date information and as such is managed through this activity.

Coordinator: Elizabeth Wolfenden (PA/Communications Officer)

Deadline: Ongoing

Funding: APC VPC

Activity: Upskilling Water Managers

The Upskilling Water Managers project focuses on expanding the grower uptake of the Vegetable Irrigation Scheduling System (VISS) in WA. Managed in-house, the project will work with the Department of Agriculture and Food to undertake one on one work with growers and train them in the use of VISS.

Project Manager: John Shannon (Field/Extension Officer)

Deadline: December 2010

Funding: Federal

Activity: Sustainable Farm Practices 2010-2013

Two applications have been made to the Caring For Our Country fund to further previous work in encouraging growers to take up the Good Practice Guide. The new applications will focus on the expansion of demonstration sites to regional areas in Carnarvon and the South West. The goal is to improve farm practices and assist growers to be able to meet the climate change challenge.

An additional project has been submitted to the APC VPC and Horticulture Australia to continue to manage the Good Practice Sites on the Swan Coastal Plain.

Project Manager: Georgia Thomas (Program Manager)

Deadline: 2013

Funding: CFOC/APC VPC/HAL

Activity: National Levy — Extension of Research Tools and Information

The new Vegetable Industry Development Program administered by HAL has yet to finalise its grower extension component. As such, vegetablesWA is going to apply to undertake this role for WA growers. This will mean liaising with HAL, AUSVEG and other stakeholders to be able to supply growers with the latest and most relevant information in the best way possible (fax, phone, sms etc).

Project Manager: Georgia Thomas (Program Manager)

Deadline: TBC

Funding: HAL.

Photo: iStock