



Pocket Herbs & Produce Pty Ltd, 67 Howards Road, Burringbar  
(Lot 3 on DP1191595)

## Report on Completion of Farm Development and Request to Council

21 November 2018

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## 1. Introduction

Development approval was granted by Tweed Shire Council for DA 17/0347 to use the land for a micro herb production facility which entailed two greenhouses and associated buildings and infrastructure on 1 April, 2014

Construction of the facility began in mid-2014 with Greenhouse 1 which became operational in October 2016 after receiving our Final Occupation Certificate on 22/9/16. The sheds and shed slabs were built between December 2014 and February 2015. Work commenced on the construction of Greenhouses 1 & 2 in December 2014. A separate open plant structure (GH3) has also been constructed on the site and this has been in operation since July 2018 and was covered by DA17/0347 approved on 22 February, 2018, we received the Final Occupation Certificate on 14 June, 2018.

Greenhouse 1 has been the main source of production since 2016 and now Greenhouse 2 is ready to commence operation. Two of the six neighbours within 150 metres of the property have made complaints to Tweed Shire Council as well as to Pocket Herbs. The location of the dwelling houses and their distance from the property boundaries can be seen from photo 1. As a result of these noise complaints from two neighbours (one adjoining to the north and one to the east on the opposite side of Howards Rd which can also be seen from photo 1), a noise Impact Study was required by Tweed Shire Council and this found that the fans in the greenhouse exceeded the noise limit criteria and the owners replaced the fans in greenhouse 1 with quieter fans which could also have the speed controlled. This was the subject of further testing and found to comply with the noise criteria. The fans have two settings which were settled on after the noise testing carried out after the fans were replaced. The two settings are low speed for night time operation (20% of full speed) and high speed for day time operation (55% of full speed). Council required the preparation of an Operational Noise Management Plan (ONMP) after the matter was reported to its meeting of 3 August 2017. It also required that Greenhouse 2 could not be occupied until the noise of the fans was tested and found to comply with the noise criteria.



**Photo 1: Pocket Herbs & Neighbours**

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An operational noise management plan was prepared in January 2018 in accordance with the Council resolution of 3 August 2017. This was submitted to Council on 9<sup>th</sup> February 2018 and Greenhouse 1 and the farm has been operating in accordance with this since then. It is noted that Council has not acknowledged receipt of the Operational Noise Management Plan and so it is considered that there are no problems with it and therefore it is assumed that tacit endorsement has been provided.

It is noted that there have been some complaints about the noise of the fans in the greenhouse, however we have been operating Greenhouse 1 in accordance with the Operational Noise Management Plan and the relevant legislation. We have done all in our power to reduce the noise of the fans and this has included replacing all of the fans in Greenhouse 1 and we also carry out regular cleaning and maintenance on the fans and other plant and machinery. We strive to be good neighbours however, it is noted that we have an approved use in a Primary Production zone and we are growing food as well as employing over 15 FTE local people in a mixture of full and part time work.

## **2. Pocket Herbs Produce and Farm Development**

Pocket Herbs grows MicroGreens, Edible Flowers, Chefs Specials and Bush Foods.

Firstly we would like to explain the delay in completing the fit out and noise testing of GH2. It took some time to ascertain the best direction to take the business forward with regards to the crops we should grow and how we should supply them. This decision directly impacts on the type of growing system installed.

After months of market research and noting that our core micro green market had lost its growth momentum, the decision was taken to replicate the system we have in GH1 as this gave us the flexibility to move into the newly identified markets for Edible Flowers, Chef Specials and Bush Foods.

A factor in the timing was also cash flow, we have limited cash to invest and the timing of its spending is critical. Given the cost of the system is over \$100,000 this was a major concern as we need the investment to produce a return as soon as is practical. We also had other cash commitments such as buying a new potting machine, completing landscaping work and building GH3. We placed the order for the GH2 system in May of 2018. The system was delivered in late August 2018. It took some weeks to prepare and install the system, as well as complete all the electrical work, we are now just about ready for production, apart from some minor irrigation modifications.

Our initial GH2 noise testing took place on 31 August 2018, with a follow up completed on 7 November 2018, a couple of factors beyond our control delayed the second set of tests, which ideally we would like to have completed in September.

Greenhouse 1 (GH1) is used for mainly MicroGreen (MG) production and Greenhouse 2 (GH2) is to be used for some flower and hopefully primarily Bush Food production. The systems in GH1 and GH2 are more suited to shorted term plants. We are still learning where to locate particular plants to optimize quality and production, whether in GH3 (Plant Shelter) or in a Greenhouse.

The Plant Structure is now fully operational with a mixture of Edible Flowers in production as well as R&D being carried out regarding Bush Food production. These Edible Flowers are being shipped to the Gold Coast, Brisbane, Sydney and Melbourne markets, but we are failing to produce enough to meet identified demand. Bush Food production is a work in progress and sales are

currently small in this area. The Plant Structure is a pod based drip feed system more suited to longer term plants.

Due to not being able to use GH2 we have had to place a number of flowers, including Marigolds, into GH1 for the past few weeks. This has led to the introduction of thrips (a pest) into our MG production and ideally we need the flowers to be located in GH2 as soon as possible so we do not start to negatively impact our MG production.

The business is also investing in several cloud based IT systems for accounting, as well as a new farm management software program called Apunga that utilizes Ipads and secure WiFi technology. This we hope will increase productivity and efficiency and reduce paperwork and wastage.

An additional 12kW of Solar Panels was installed over the winter that means we are currently energy neutral with 42kW of solar generation in total. We have solar hot water, composting toilets and compost our waste plant materials. We are committed to this sustainable and ethical business.

However, business was very flat over the winter period and it is vital for the health of the business that we introduce new products and expand production as quickly as we can to secure the existing staff positions. The operation of GH2 will enable extra hours to be worked by some of the existing part-time/casual staff.

Despite our explanations to the contrary there is an ongoing misapprehension that the HAF fans can either be adjusted remotely by staff off site or that the same HAF Fans can self-adjust fan speeds depending upon the temperature or humidity. Both of these assertions are wrong. The Autogrow controller only automatically controls the time the fans change their speed from day to night mode and visa-versa. The fan speed settings are 'set and forget' by using the Variable Speed Drive (VSD) units in each greenhouse. GH1 has a single phase digital VSD that can only be manually adjusted onsite. The GH2 is a three phase hard wired VSD that requires a licensed electrician to actually rewire the unit to adjust the fan speeds set for day and night modes. As there are no staff on site at night it is impossible to adjust the fan speed settings for the day and night modes. The fan speeds for GH1 are 20% at night and 55% during the day. The fan speeds for GH2 are 20% at night and 60% during the day but are quieter as these are a more efficient fan.

Please note that the HAF fans are not used to control heat or temperature per se', they are there to maintain critical air movement primarily to provide an optimum growing environment which is even through the greenhouse and to assist in the removal of humid air from around the plant leaves themselves.

*Please refer to the following letters in the Appendices:*

*Letter from Zak Iqbal, Autogrow, re HAF fans and speed control operation.*

*Letter from Cave Electrical, regarding the HAF fans and speed control operation.*

*Letter from Robert Hayes, regarding the HAF fans needs and speed control operation.*

Finally, we would like to point out that as a business we have invested in excess of \$2M in the farm to date and we estimate we inject over \$1M into the local economy annually.

*Please refer to the following letters in the Appendices:*

*Letter from Brad Ferguson, Bookeze, re Contribution to local economy.*

### **3. Previous Noise Reduction Work Carried Out.**

Despite our initial issue with the old fans in GH1, that we have addressed, we have co-operated

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fully with Tweed Shire Council and acted reasonably regarding any complaints. We would like to identify the previous noise reduction works carried out:

Generator.

At the request of Council this has been fully enclosed to reduce its impact as much as is possible. It is covered by the ONMP. It should be noted the generator is only used during power cuts and has operated on 12 days since the start of 2018, 4 days due to local tree trimming operations and 8 days due to general power interruptions, usually these interruptions are for less than 15 minutes.

Main Pump Timing

At the request of Council this was modified to reduce its operation to between 7am and 7pm. It is covered by the ONMP.

Gurney

We took it upon ourselves to source and purchase an electrically powered gurney, rather than a petrol powered one as the electrical one is quieter. This is covered by the ONMP.

Back Mister

We took it upon ourselves to source and purchase a new smaller and more efficient Backpack mister. This is covered by the ONMP.

Hot Water Boiler

After the installation of a newly purchased heating boiler (in May 2018) we took it upon ourselves to extend the insulation of the boiler and the chimney. We found this had a significant improvement in the amount of noise generated at the outside of the boiler shed. It is now covered by the revised ONMP.

Potting Machine & Compressor

After the installation of a newly purchased potting machine (September 2018) we immediately recognized that the supplied compressor was too noisy. We researched and sourced an insulated compressor within the week as well as adding temporary noise control measures to the originally supplied compressor as an interim measure. After noise testing we have identified that shutting the nearest roller door enables us to comply with the noise criteria. This is now covered by the revised ONMP.

Growing Media Truck Deliveries

We built a large growing media storage area so we could receive 10m<sup>3</sup> deliveries as opposed to our usual 5m<sup>3</sup> deliveries. This has halved the number of truck movements.

We believe the above, along with the updated ONMP discussed below demonstrates our commitment to being a responsible business and a good neighbour. Being a business we will always generate some level of noise, the challenge is to reduce this to a minimum and to meet the standards in the ONMP.

## **4. ONMP Updated**

The original ONMP dated 31<sup>st</sup> January 2018 has now been updated to include the GH2 HAF fans, the GH heating hot water boiler and a new replacement compressor, potting machine and ancillary equipment. A copy of the new ONMP has been submitted to Council. In relation to the ONMP we have carried out the following during the past months:

- Installed a replacement greenhouse heating hot water boiler that has been fully insulated to

minimize noise. Our initial heater was leased and found to be not fit for purpose. The new chimney has also been lagged and the flu is directed away from all neighbours. The boiler ran at night only from June to October to maintain a minimum temperature of 14 Degrees C in the GH. It will not normally be used out of those winter months. We have received no complaints regarding the boiler operation, either this year or last year. However, we feared that this may have been the reason for some of the complaints and we acted on this by removing a suspect cowl without any direction from the Council as we strive to be good neighbours.

- Installed the growing system, HAF fans and completed the electrical wiring in GH2. The growing system is identical to that in GH1. The HAF fans are the 'Rolls Royce' of HAF fans especially imported from Europe and are known for their efficiency and quietness. Over the past few months have received several complaints from Ms Pasz alleging we were using the HAF fans without Council approval. This is not true. The only fan in intermittent use was a pedestal fan being used to keep several staff cooler when building the system in GH2 and spending all day doing so. This was a Workplace Health and Safety Issue. We also received complaints about the temporary construction noise regarding concreting the paths and installing of drainage rock under the systems area. We had hired two 'dingos' to ensure this activity was completed as quickly as possible and with the minimum disruption we could. It is noted that the complaints from Ms. Pasz regarding the time and extent of the noise were exaggerated as we have records of the start and finish time of each work activity, and these are not considered to be unreasonable for construction work.
- A new potting machine was purchased to replace the old potting machine that had reached the end of its useful life. The new potting machine uses compressed air for some of its actions. The initial compressor supplied was very noisy and as we immediately sourced a replacement silenced compressor We received a complaint from Ms. Pasz relating to the noisy compressor, that we agreed was way too noisy, and we immediately purchased a 'silenced compressor' and communicated with her about this in a timely manner as well as apologising for the disruption.

## 5. Complaints Handling and Analysis

We strive to be good neighbours and deal with complaints in a timely manner and also are proactive with noise and other issues and this is evidenced in the manner in which we dealt with the additional insulation of the boiler room and the removal of a suspect cowl.

In summary we have received 11 complaints since the start of the ONMP at the start of the year. All complaints originate from 2 of our 6 neighbours. 2 of the 11 refer to one off construction activities which were carried out in accordance with the relevant legislation. It is noted that during construction there is more noise than during the operation of the greenhouses. Another of the complaints relates to the false accusation of using GH2 fans. This means a total of 8 complaints that we believe to be valid have been received.

There have been no complaints regarding the operation of the hot water boiler (we spent a lot of time and money in sound proofing the boiler and chimney in the early winter) and this boiler has been running every night from end June through to early October. This would, we believe, rule out the boiler as a source of noise. Further, no complaints regarding any night time or day time noises were received at all from 7/7/18 to 27/10/18, a period of 16 weeks or 3 ½ months. During the majority of this time the boiler was operational.

The complaints break down as follows:

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- 20/2/18 – Ms Pasz. Complaint about day time washer noise, Electric gurney use is allowed under the ONMP. Dealt with via TSC.
  - 31/3/18 – Ms Pasz. Complaint about day time fan noise. Responded 1/4/18.
  - 11/4/18 – Ms Minto. Complaint about one off construction noise. Responded 12/4/18.
  - 14/4/18 & 19/4/18 – Ms Pasz. Complaint re-one off construction noise and mentions GH1 Fans. Responded 16/4/18 & 19/4/18.
  - 9/5/18 – PHP informed neighbours re concreting delay.
  - 25/5/18, 27/5/18 & 29/5/18 - Ms Minto. Complaint re night time HAF fan noise. Responded 25/5/18, 28/5/18 & 7/6/18.
  - 4/6/18 – Ms Pasz. Complaint re night time HAF fan noise. Responded 7/6/18.
  - 12/6/18 - Ms Minto. Complaint re night time HAF fan noise. Responded 13/6/18.
  - 14/6/18 – Ms Pasz. Complaint re night time HAF fan noise. Responded 15/6/18.
  - 7/7/18, 27/10/18, 29/10/18 & 31/10/18 - Ms Minto. Complaint re night time HAF fan noise. Responded 12/7/18, 29/10/18, 30/10/18 & 2/11/18.
  - 6/9/18 & 7/9/18 – Ms Pasz. Complaint re compressor noise. Responded 6/9/18, 7/9/18 & 12/9/18.
  - 19/9/18 & 2/10/18 – Ms Pasz. Complaint re GH2 HAF Fans. Responded 21/9/18 & 20/11/18. See note below.

Note: We did receive a follow up email regarding the GH2 Pedestal Fan from Ms Pasz on 2/10/18 that was unfortunately missed internally, we responded to this on the 20/11/18 as you can see above. We have changed our procedures to create a separate email account for complaint purposes and have set up procedures where these emails are forwarded to management computers or phones.

The following comments are made on the complaints.

Construction Noise – 2 complaints but activity permitted.

Mainly due to several concrete trucks, concrete pump and the delivery and spreading of drainage rocks under the GH2 system. These activities were carried out in accordance with the relevant legislation and were one off occurrences during construction. These activities are permitted.

Day Time Noise – 3 complaints (one activity is permitted under the ONMP).

Several of these complaints are indeed understandable. One was raised due to a misunderstanding and the other relates to the over loud compressor as mentioned above. The remainder relate to apparent fan noise that cannot be accounted for as the farm has been operating to the agreed ONMP.

GH2 Fan Noise – 1 complaint made to us, and another to TSC which resulted in a site visit by officers of Council. The GH2 fans have not been used as the GH is empty. In addition, we do not have any approval to operate GH2 and we are in the process of seeking this approval. A pedestal fan was being used to keep staff cool during a hot spell when working hard installing the GH2 growing system. This is for staff OH&S reasons and is legitimate. We note that this complaint seems not to have any foundation.

Night Time Noise – 5 complaints

The HAF fans in GH1 have been at the same settings since before the ONMP came into operation in January 2018, and we have made no alterations to them as we have no need to. The pedestal fans are only operations in day time hours as per the ONMP. This, we believe, rules out the HAF or pedestal fans as a source of night time noise.

Having regard to the fact that the operation of the fans has not changed since they were installed and have been operating in accordance with the ONMP, it is difficult to respond to the complaints



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due to the non-specific nature of them. The complaint states that there are 'noises at night' with no descriptions of the time, type of noise, or other information that can be investigated. The only response that can be given is that 'we are operating within the agreed ONMP and we have do not know what type of noise you are referring to'. We also note that the noise complaints do not seem to be on the same night. The HAF fans are the only noise sources from the greenhouse at night.

### Summary

We respond to any complaints in a timely manner when possible. We regularly carry out maintenance of all equipment to ensure they are as quiet as they can be. The GH1 HAF fans have been taken down and cleaned and lubricated on 6/8/18 and 5/11/18.

We have been operating in accordance with the Operational Noise Management Plan since it was prepared and submitted in January this year. We have not made any changes to the operating speeds of the fans and this is not able to be done at night because it is controlled by the computerised controller after hours.

We are concerned that we are receiving a number of complaints from these neighbours, which are not specific enough to be investigated. We have responded to the complaints each time they have been received to the effect that the fans are operating within the normal parameters set down in the Operational Noise Management Plan. We are not sure how else to respond.

However, issues have been brought to our attention and we appreciate that the 2 complainants may not understand fully the operation of the business. We have therefore offered to attend the site on receipt of a call from a neighbor who is hearing a noise outside of normal operational hours, this way we can attend the business and possibly identify a source at that moment, regardless of time or day. We have also emailed the neighbors with a request to include in the subject heading of any email whether it is a question or comment or a complaint. This way we can more easily monitor communications and act more effectively. This email and offer was sent on 9th November 2018. A copy is attached.

***Please refer to the following email in the Appendices:***

***Email from Pocket Herbs to neighbours offering to attend site out of business hours to identify (mainly) night time noises .***

Please find attached a report compiled by Kevin Blackmore at AutoGrow Systems in New Zealand. It has been compiled by him digitally accessing the memory of the control system and downloading the necessary relevant data. This is not something that can be done onsite. It was compiled at our request in order to respond to the claims made by Ms Minto and Ms Pasz that the speed of the fans had increased during the night during the months of April and May. The report shows that the GH1 HAF fans have not operated at a higher speed during the night time, as alleged by Ms Pasz and Ms Minto, the only variation has been the occasional lower speed operation during the day time, which are manual adjustments made during the cleaning process of the fans in question.

***Please refer to the following report in the Appendices:***

***Report from Kevin Blackmore at Autogrow regarding HAF fan operations in GH1.***

In order to try to be proactive with these complainants, we sent letters to both neighbours on 7 May 2018 requesting them to clarify the nature of their concerns but have not had any replies to them. We have checked with our neighbour to the South (47 Howards Road) and they have heard nothing during the night time and are not concerned about one off noises due to onetime construction works that have now ceased. As stated previously we have good relations with 4 out of our 6 neighbours

and we have received no complaints from them.

We would like to make the following comment on a recent email from Ms Minto on 27/10/18 that was made in more detail to Council than to us. The email was mainly a follow up to a complaint originally made on 7/7/18. The information we had from Ms Minto was lacking in detail and did not mention any pedestal fans and we only understood what this could be about after communication with officers of Tweed Shire Council. We were not operating an extra pedestal fan contrary to the requirements of the ONMP. We have 3 pedestal fans that are used regularly during packing on hot days to keep staff cool, as per the ONMP. During the period from approximately 11 October to 21 October 2018 there was exceptionally wet and humid weather that severely impacted on the Coriander crop due to the nearly 100% relative humidity with the resulting fungal issues. In an effort to reduce or stop the plant losses one of these pedestal fans was placed by the Coriander area and used temporarily and intermittently in an effort to improve the airflow situation. This temporary use started on the 17 October 2018 until around 28 October 2018. The pedestal fan in question, was turned on at a lower setting from around 8.30am until mid-afternoon and was not turned on every day. It was not used at night. It was a bit of an experiment suggested by a staff member to see if this would assist in ameliorating the problems we were having.

I should point out that these pedestal fans have been in use during pack days since the start of operations in October 2016 that was a very hot period. Given these pedestal fans are used regularly and without complaint, this temporary use of this fan has not resulted in any higher noise generation than normal. As a result the staff in question felt there was no conflict with the ONMP.

I should also point out that this particular enquiry, regarding pedestal fans, was not sent to us by Ms Minto and as a result was not responded to. We have received several emails from Ms Minto and Ms Pasz that are very unclear by nature and lack any form of detail such as sound description, timing, frequency, duration etc. It is frankly impossible to deal with such emails in any meaningful way except to repeat the phrase, 'we believe we are operating within the parameters of the ONMP'. Which is what we strive to do.

## **6. GH2 Noise Impact Assessment and General Testing Report**

Please refer to CRG Acoustics report titled: Environmental Noise Impact Report, dated 20/11/2018.

This report confirms that noise from the operation of GH1 and GH2 can be controlled to comply with the noise limit criteria as required by Council. This will be achieved through maintaining the preprogrammed fan speed controls and adherence to the Operational Noise Management Plan.

## **7. Request to use GH2 Operationally**

We hereby request written formal Council approval to enable us to use GH2 for the purpose it was intended.

We have an immediate pressing need to use GH2 as we now have serious thrip problems in the (mainly) Marigold flowers in GH1 which has led to thrips being found on our Micro Green products. This is a serious issue and we need to be able to treat the Marigolds in a separate location to the Micro Green products and to separate them completely from the Micro Greens. The ramification of not being able to do this is serious, as this could easily impact on the main breadwinner for the company, namely Micro Greens. We are entering our busiest period and need to ensure we are pest and disease free in our Micro Green production area.

On a more positive point, Bush foods are an exciting and up and coming food trend but most are now foraged from the foreshore. This is leading to a situation that is untenable where increasing demand is leading to some unscrupulous foragers and people looking to make a quick buck to literally 'rape' the foreshore of certain plants and is leading to the killing off of certain growing areas due to over eager pruning or just plain greed. Further, there can be no traceability for food safety of crops harvested this way as no one knows what they have been sprayed or other potential contaminants may have come into contact with them.

These varieties include Warrigal Greens, Karkalla, Samphire, Sea Celery and Sea Purslane. We intend to become a centre of excellence in the sustainable growing of such plants as we can control the level of saline in the nutrient solution in order to produce a safe, high quality crop in a reliable and sustainable way.

Excitingly we wish to advise Council that we have started working with Southern Cross University Assoc. Prof. Bronwyn J Barkla, who is the Director of Southern Cross Plant Science, and the well-known Bush Foods expert Peter Hardwick in developing growing protocols for these Halophyte (salt tolerant) plant production in a sustainable way. The use of GH2 is vital to us progressing this innovative and ground breaking research.

***Please refer to the following letters in the Appendices:***

***Letter from Assoc. Prof. Bronwyn J Barkla, Director of Southern Cross Plant Science.***

***Letter from Peter Hardwick, Bush Food Entrepreneur and Forager.***

We note the Tweed Link article of October 4<sup>th</sup> stating Councils support for sustainable and ethical businesses in the region. Further we sponsor Pottsville Soccer Club, support Burringbar Primary and Kingscliff TAFE with education visits; we donated to the local Burringbar Cyclone Debbie Appeal and are an active member in the Northern Rivers Food network. We hereby request your support and understanding.

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## 8. Photos of Work Completed to Reduce any Noise Impacts

### Boiler



Old Boiler



New Boiler Unlagged



New Boiler Noise Insulated



New Chimney Noise Insulated

Compressor



New Compressor

Generator



Generator being Noise Insulated



Generator Noise Insulated

## Appendices

Letter from Zak Iqbal, Autogrow, re HAF Fan Operation

Letter from Mark Cave, Cave Electrical re HAF Fan Operation.

Letter from Robert Hayes, Farm Management Consultants re HAF Fan Operation

Letter from Brad Ferguson, Bookeze, re Contribution to local economy.

Copy of email sent to neighbors 9/11/18

Report from Kevin Blackmore at Autogrow, NZ.

Letter from Assoc. Prof. Bronwyn J Barkla, Director of Southern Cross Plant Science.

Letter from Peter Hardwick, Bush Food Entrepreneur and Forager.



9<sup>th</sup> November 2018

Planning Committee

Tweed Shire Council

PO Box 816

Murwillumbah

NSW 2484

The Autogrow control software for Horizontal Airflow Fans only allows the ability to turn fans on and off based on time periods and status of Venting, Co2 injection, Heating, Fogging and high Relative Humidity and Temperature. There is no ability in the software to automatically control the speed of the fans connected, at any time.

The HAF fans do not self-adjust their speeds depending upon the temperature or humidity at day or at night. The speeds themselves cannot be adjusted remotely. There are two digital fan speed controllers, one can only be adjusted onsite and is a hard-wired unit so it needs an electrician to adjust the fan speed. The other controller can also only be adjusted onsite.

Regards

**Zak Iqbal**

**BDM Australia**

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Tweed Shire Council  
Planning Committee  
PO Box 816, Murwillumbah  
NSW 2484

I write to confirm that The Variable Speed Drive (VSD) that I have connected to Horizontal Airflow Fans (HAF) in Green house two only has two speeds available that are hard wired. The Autogrow control system enables switching between day and night mode and does not have the capacity to change speeds other than the two preset speeds mentioned.

Photo attached shows the VSD hard wired terminations to change speeds would require:

- 1 A qualified Electrician that is familiar with the VSD to attend site
- 2 Isolate power to the VSD drive and fan circuits at sub board
- 3 Use tool to gain access VSD control box
- 4 Disconnect the fan connections in the VSD control box terminals shown in pic
- 5 Reconfigure the fans to new VSD output at control terminals
- 6 Re-energise and test for polarity and phase rotation
- 7 Use tool to secure control box



This procedure would take about an hour to do and even then the fans would be fixed to the new speed i.e unable to be changed remotely.

If you have any further question, please do not hesitate to contact the undersigned.

Kind Regards,  
Mark Cave

*Mark Cave*

Managing Director  
Cave Electrical and Solar  
[mark@caveelectrical.com.au](mailto:mark@caveelectrical.com.au)

## Farm Management Consultants Pty Ltd

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Tel: (0418) 376 258

12-11-2018

Mr Iain Reynolds,  
Director,  
Pocket Herbs & Produce Pty Ltd  
Po Box 54  
Burringbar, NSW, 2483

Dear Iain,

### **Re: Private and Confidential - Greenhouses & Horizontal Airflow Fans**

On September 17<sup>th</sup> last I visited your property as your guest, to inform myself about your operations from a technical perspective, and out of professional interest. My background in greenhouse production of fresh herbs goes back to 1977 when I established my the first greenhouse herb production facility. In 1983 I adopted hydroponic production inside polyhouses, and began evolutionary development of greenhouse technology which continued until earlier this year on 3 separate farms. I have been a significant greenhouse grower and marketer of fresh culinary herbs and specialty produce for over 40 years employing up to 100 staff.

I was elected to the Board of the Australian Hydroponics and Greenhouse Association in 1993 and retired in 2003 having served as Chair for two years. In 2009 I again joined the Board as it transitioned to Protected Cropping Australia Ltd, and chaired that organisation from 2015 to 2017 when I retired from PCA. In 1993 I was the founding Chair of the Australian Herb and Spice Industry Association Ltd, and retired as a Director in 2017.

Subsequently to visiting your Burringbar facility, you have asked me to provide some commentary on the overall systems, but with reference to the internal climate of the greenhouses, and in particular the operation of the Horizontal Airflow fans (HAF's).

### **General Description.**

I note that your operations comprise the following significant investments:

- 2 x enclosed poly greenhouses,
- 1 x open walled poly roof structure,
- a packaging and general stores shed,
- multiple water tanks and associated water treatment infrastructure,
- staff amenities facility,
- a multi-purpose shed incorporating potting machine, seeding facility, germination rooms, packing "clean room", and administration and managers office.
- ancilliary roading, power and water internal infrastructure.

### **Greenhouse Infrastrucure.**

Greenhouses (GH) 1 & 2 comprise commercially built (Greenhouse Structures Australia), galv steel framed, 4m bays x 6.4m span width, solarweave covered roof with centre hinged side lifting half roof vent, 4.6m average wall height, insect mesh to walls with motorised drop-side solarweave wall curtains. Internal fit out includes retractable Ludvig Svensson XLS 45F Harmony thermal screens (45% foil, 55% light transmission open weave), high pressure misting to hardening off area in GH1, diesel fired hydronic heating, raised rolling benches.

GH1 has a total of 17 x DS Horticulture HAF's, and GH2 has 8 x Vostermans HAFs, all with Variable Speed Drives (VSD) linked to a VSD control unit.

Irrigation is a "closed recirculating system" utilising flood & drain technique to rolling benches, with 100% of drainwater returned to holding tanks where it is filtered, nutrient EC and pH are rebalanced from A, B and pH dosing tanks, which is blended with fresh water to a target EC, and is then recirculated back to the crop.

#### GREENHOUSE AREAS

	m <sup>2</sup>
GH 1	2304
GH 2	1434
<u>GH 3</u>	<u>256</u>
TOTAL	3994

#### **Greenhouse climate management.**

You have installed Autogrow Intelliclimate and Intellidose hardware, and utilise Autogrows Intelligrow cloud based software to monitor your systems operations. This is not a comprehensive integrated climate control system such as the Priva and similar high end control systems that allows every aspect of the greenhouse climate management systems to be automatically sensed and controlled, with remote management possible from every corner of the globe. Many of the controls are not relevant to your system such as CO<sub>2</sub>, fogging or positive or negative air pressure fans drawing through humidification pads. Such systems cost tens of, or even hundreds of thousands of dollars.

The Autogrow system is fit for purpose in your enterprise, does not over-capitalise with a control system designed for much larger installations with highly complex climate management software evolved for cool to cold climate growing systems. Having said this, the Autogrow Intelligrow cloud based system only provides limited remote control – it is largely a software facility that stores accumulated historical climate data (internal and external air temperature and humidity, and external wind speed) sent to it from the hardware sensors and provides graphical presentation and historical data export & analysis capacity. It is primarily designed as cost effective tool for real time local and remote monitoring of medium tech horticultural production systems.

Intelliclimate has just two greenhouse hardware technologies which it can control automatically in real time, to influence two key greenhouse climate factors – air temperature and relative humidity.

1. by opening and closing the roof vents and side walls to promote or reduce outside air exchange, and
2. by opening or closing the thermal/shade screens to reduce day time insolation, or night time outsolation.

Greenhouse heating during winter is managed semi-automatically by a daily schedule timer, linked to a temperature sensor in each greenhouse. The system only operates for a few months of the year, and is otherwise switched off. I am not familiar with the simple hardware installed to implement this control system. The very short winter duration combined with the systems simplicity and the relatively low risk should it fail leads me to the same conclusion – it is fit for purpose.

Intellidose schedules your irrigation and manages the irrigation nutrition via pH and EC sensors in the return water tanks and in the outgoing feed system. This is implemented utilising standard A & B nutrient and pH concentrate tanks and dosing pumps controlled by the unit to maintain constant conductivity (a measure of the total dissolved nutrients, and the pH of the irrigation water. This has been standard industry practice for decades for this type of operation.

HAF's (make = DS Horticulture) in GH 1 are controlled on a time schedule basis via the Intelliclimate hardware system, with two periods each day – (daytime) 7am to 5pm & 5pm to 7am (night). Fan speeds are not controllable via the Intelliclimate CPU itself. The fan speeds in GH1 can only be manually programmed via the VSD control unit located in the greenhouse, with the capacity to set the % percentage of maximum fan speed, for each period. I understand this is currently 55% in the day and 20% at night. As such, the period stop start settings, and the fan speed is not controllable directly from the Intelligrow/Intelliclimate

system on the office interface, or remotely. I understand that the operational status of the fans is recorded in the Intelligrow system, but the percentage fan speed setting from the VSD unit is not passed through.

HAF's (make = Vostermans) in GH2 and its associated VSD hardware unit are also controlled by the Intelligrow system. However the HAF fan speed can only be manually changed by a qualified electrician.

### **Horizontal Airflow.**

Food and flower production in “protected cropping” or greenhouse structures has existed for centuries. The research and development leading to today's medium and high tech production facilities really began in the 1960's and 1970's (and has accelerated ever since). This occurred largely as a result of Dutch growing systems being constructed around the world in climates vastly different to the northern European climate the Dutch had developed their technology for. Inside each (static) greenhouse structure, temperature and humidity levels vary considerably throughout the structure, depending upon a complex of multiple interacting factors – external air temperature, relative humidity, wind speed and direction, day time solar radiation levels and night time outsoleation levels, internal and external relative humidity, and internal heating type and layout. The design, orientation and fit out of modern greenhouse structures are intended to minimise this variability to provide optimal growing conditions for the intended crops – in your case, potted microgreens.

Whilst Dutch greenhouse technology has been dominant for many decades it was a US researcher who first identified temperature and humidity variation within greenhouse structures as an issue and developed the concept of horizontal airflow to optimise the growing climate for crops inside. There is no better summation of the science and potential benefits of Horizontal Airflow than is found in the attached article from Greenhouse Product News – “Grower 101: Horizontal Air Flow” by John Bartok, Jr, agricultural engineer and extension professor emeritus in the Natural Resource Management and Engineering Department at the University of Connecticut, Storrs, Connecticut, USA.

During the day time, without HAF's the air temperature and relative humidity within your greenhouses will vary substantially depending upon the individual plants location relative to an opening roof vent, side wall or access door, and total insolation. The temperature variations can be up to 6° C in the horizontal plane and much higher in the vertical plane. Daytime radiation levels vary from dawn to dusk, from summer to winter.

During the night time much greater temperature and particularly humidity variation can occur. This is especially the case in the winter period. Depending upon heating method and distribution, variance can be even greater especially at night time. Temperature variations of up to 8° C can be found in the horizontal plane, and much greater variation from ground to roof. This in turn results in widely varying relative humidity levels throughout the greenhouse, and can lead to dew point being reached in discrete and seemingly random areas. This is a recipe for the development of the fungal diseases collectively known as “damping off” and can be very costly to the uninitiated grower. This is especially the case for seedlings which are at their most susceptible to even low pathogen levels - all that you grow are seedlings.

Plant temperature is a fundamentally important factor that influences growth. Too high and the plant in effect sweats as we humans do. Depending upon temperature all growth stops whilst it in effect pumps water to try and maintain its preferred core temperature. Temperatures below optimal levels result in reduced growth. Whilst the sun's radiation is the primary source of energy that drives plant temperature, it also drives the air temperature inside the greenhouse which in turn influences the temperature of the plant. The three management tools at your disposal to optimise plant temperature inside your greenhouses are the thermal/shade screens to manage insolation and outsoleation, the roof and sidewall vents for utilising external air, and the HAF's.

Research into HAF's has identified three key benefits – minimisation of temperature and relative humidity within the greenhouse resulting in the most even and predictable crop growth, reduced plant disease due to reduced dew point occurrence at night time, and improved plant growth rates through air movement over the plant canopy replenishing CO<sup>2</sup> to the plant during the daytime.

HAF's are now incorporated in every medium to high technology level greenhouse development around the world, and yours is no exception.

Should you have any queries, please contact me at your leisure.

Kind regards,

A handwritten signature in black ink, appearing to read 'R Hayes', written in a cursive style.

Robert W Hayes  
Director,  
Farm Management Consultants Pty Ltd  
Robocrop Pty Ltd

18 November 2018

Planning Committee

Tweed Shire Council

PO Box 816

Murwillumbah, NSW 2484

To whom it may concern

My name is Brad Ferguson and I am the owner of Bookeeze, a bookkeeping practice based in Pottsville (ATO registered BAS Agent No. 25580996). I act as bookkeeper and BAS agent for Pocket Herbs and Produce Pty Ltd, and have done so for the last four years.

I am writing in relation to my client's current application to have their second greenhouse approved for use. I think that it is firstly very important to note that my client has invested in excess of \$2M in developing the farm to the point at which it currently stands. A significant portion of this amount has been in the development of the greenhouse in question, as well as in the additional capacity of the other production areas throughout the farm in order to be able to a) supply the greenhouse with product to grow, and b) harvest and/or process the product once grown.

My client has been experiencing a decline in trade over the past 12 months, and as such, they have invested in research and development in order to develop new product lines so that they may diversify and expand into new markets. The greenhouse in question is to be the main growing area for these new products.

Pocket Herbs and Produce currently employ over 15 FTE (full time equivalent) people from the local area. They have a focus on providing local jobs and using local suppliers. In fact, I can confirm that they have spent in excess of \$4M in the local economy through employment and the utilisation of local suppliers over the last four years alone.

Given the recent downturn in demand for the traditional microgreen product, I believe that it is absolutely critical for the survival of the business that the new greenhouse commence operation as soon as possible. Should this not be permitted to happen then I fear that operations will need to be scaled back causing staffing cuts and a reduction in expenditure overall. Obviously this would be to the significant detriment of the local economy.

I hope that this gives you a clearer picture as to the ramifications for both my client's business and the broader community of the current decision regarding their second greenhouse.

Yours Sincerely



Brad Ferguson

## Janet Twohill

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**From:** Pocket Herbs <farm@pocketherbs.com.au>  
**Sent:** Friday, 9 November 2018 9:10 PM  
**To:** NB Minto; Kate Pasz  
**Cc:** David Bell; Chris Cherry  
**Subject:** FW: Improved Communications and Offer

Dear Neighbour,

In an effort to differentiate more clearly between a comment, question or complaint and respond more effectively, could you please add in the subject heading of any email, one of the following options:

Comment or Question – for any communication other than a complaint.

Complaint – for any communication referring to a noise or operational issue relating to the business

This way staff can more easily identify issues and direct or prioritise accordingly.

Further, in the event of any noise issues please provide details to us as follows: description as best you can, frequency, duration, start and end times, suspected source of sound, level of sound ie quiet/loud.

As a measure of goodwill, we are offering to attend the site on receipt of a call from a neighbour who is hearing a noise outside of normal operational hours. This way we can immediately attend the business and possibly identify a source at that moment, regardless of time or day. Please call :

Ian Collier on 0428 785777

Iain Reynolds on 0422 010732 available after 18<sup>th</sup> November 2018

Mandy Reynolds on 0418 872220 available after 18th November 2018

Regards,

Pocket Herbs & Produce Pty Ltd  
PO Box 54  
Burringbar  
NSW  
2483

T: 02 6677 1748

E: orders@pocketherbs.com.au

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**From:** iain.r@pocketherbs.com.au [mailto:iain.r@pocketherbs.com.au]  
**Sent:** Thursday, 8 November 2018 11:07 AM  
**To:** 'Ian Sinclair'; 'Clarissa Huegill'; 'Jay Carter'  
**Cc:** 'Pocket Herbs '; ian.c@pocketherbs.com.au; 'Mandy Reynolds'  
**Subject:** Improved Communications and Offer

*Ian/Clarissa (and Jay), after consultation with Council yesterday we intend to email the following to all neighbours. Comments please.*

# Fan Speed Report

-- PocketHerbs --

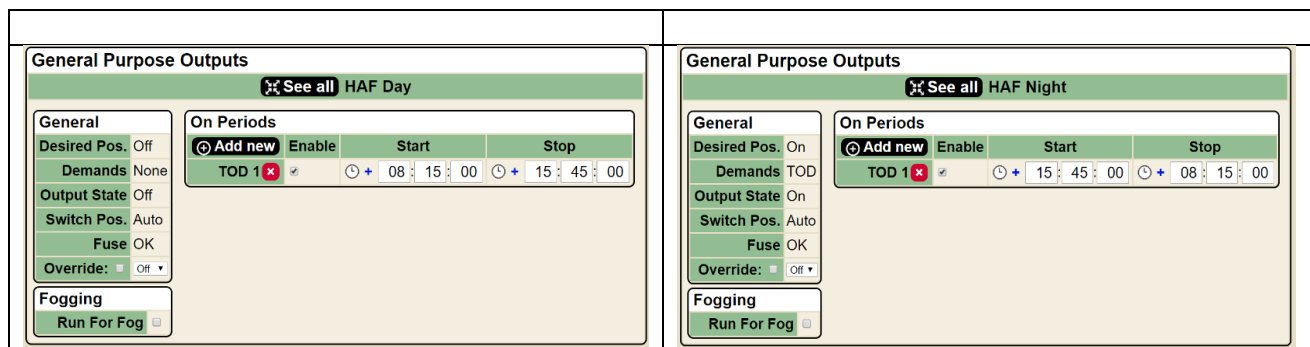


PocketHerbs utilizes two separate General Purpose Outputs on their Multigrow system to adjust the speed of their Fans to minimise the noise output.

When the either output is on, the Fans speeds are adjusted as follows:

- Low-Speed: 20% of full speed
- High-Speed: 55% of full speed

The system is configured such-that the Fans operate at HighSpeed (55%) only between the hours of 8:15am to 3:45pm. Outside of these hours the fans will only operate at Low-Speed (20%) as shown in the settings captures below:

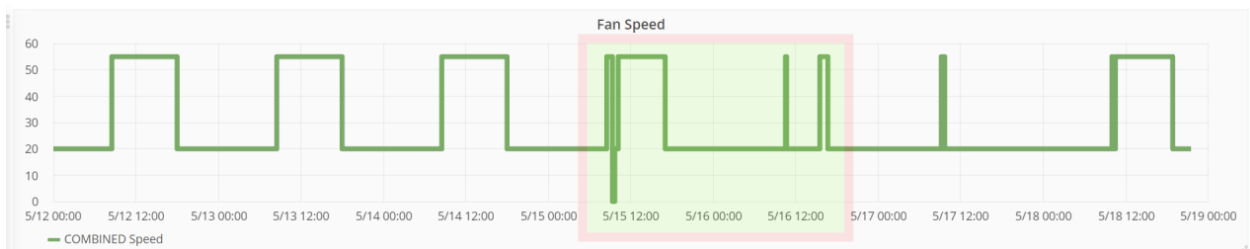


From the Multigrow controller we have extracted the measured output states and combined them onto a chart showing the individual states (green => Low Speed, red => High Speed) and the fans speed (20% or 55%).

We have captured these states for every 7-day period since the 1 April 2018 up until the 31 May 2018, all are shown below.

## Observations:

For over 98% of the operating time observed the fans operated at their expected speeds with the exceptions occurring on the 15<sup>th</sup>, 16<sup>th</sup>, 20<sup>th</sup> & 21<sup>st</sup> of May where the fans operated at Low speed during the day-time. *There appears to be no instance where the fans operated at a speed above their expected value.*

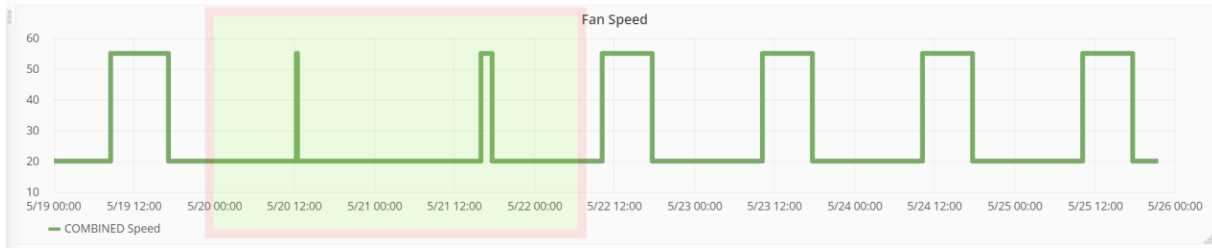


1: Low-speed during daytime on 15th and 16th of May



# Fan Speed Report

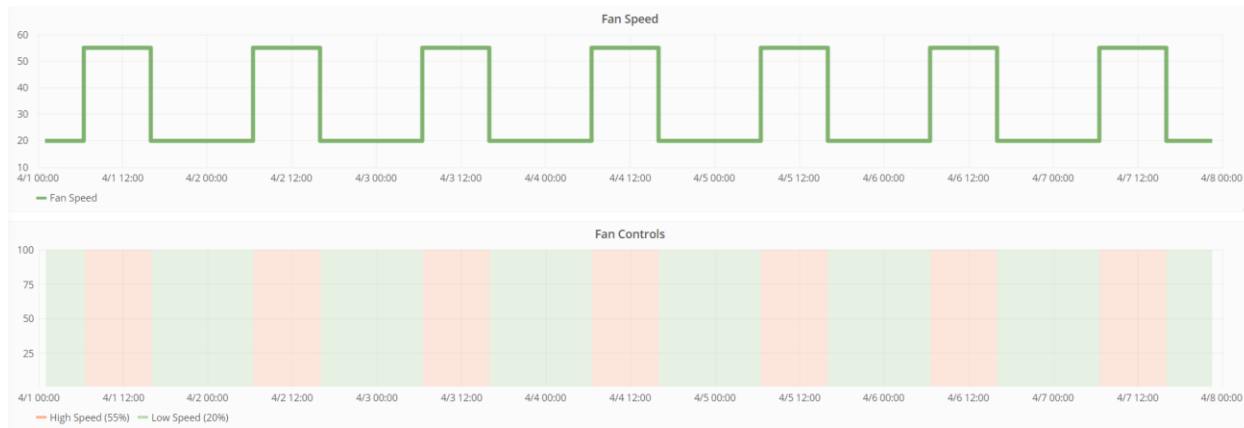
-- PocketHerbs --



2: Low-speed during daytime on 20th and 21st of May

## Fan speed history:

The following are captures of the Multigrow history detailing the FanSpeed operation over the last 2 months:



1 April to 7 April 2018



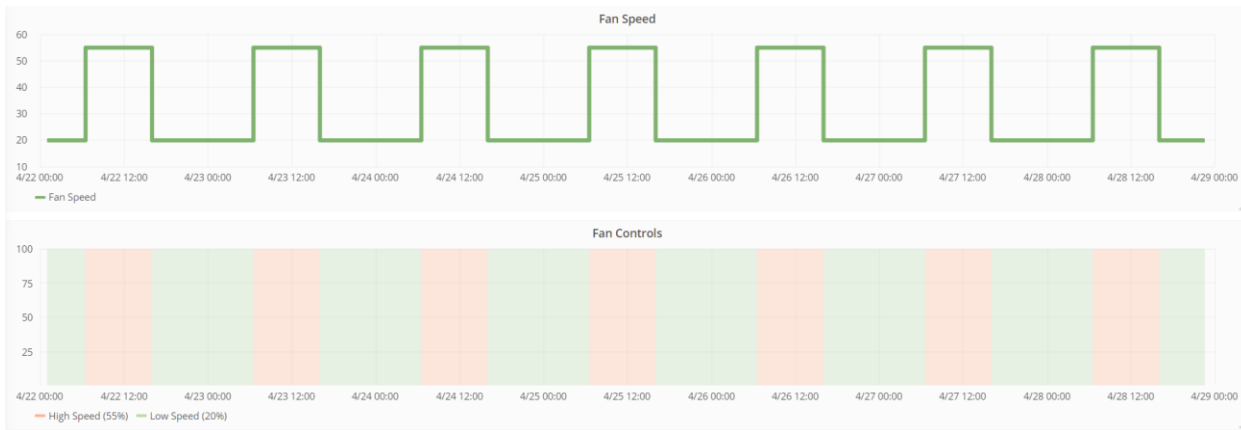
8 April to 14 April 2018

# Fan Speed Report

-- PocketHerbs --



15 April to 21 April 2018



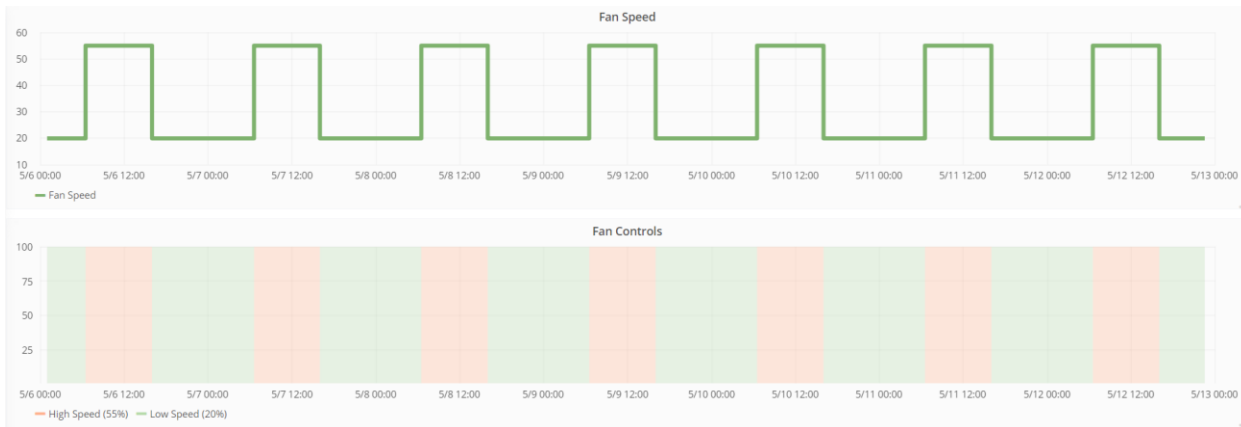
22 April to 28 April 2018



29 April to 5 May 2018

# Fan Speed Report

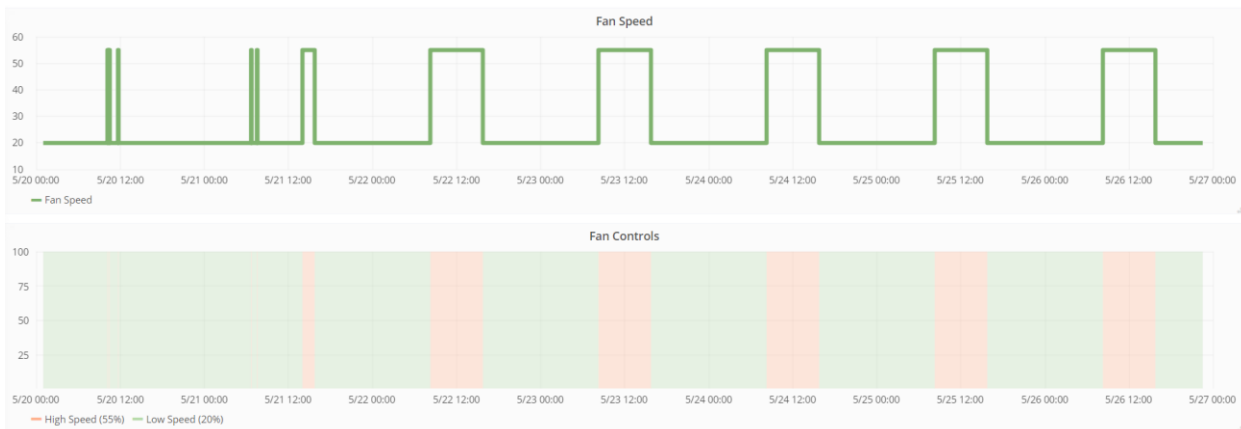
-- PocketHerbs --



6 May to 12 May 2018



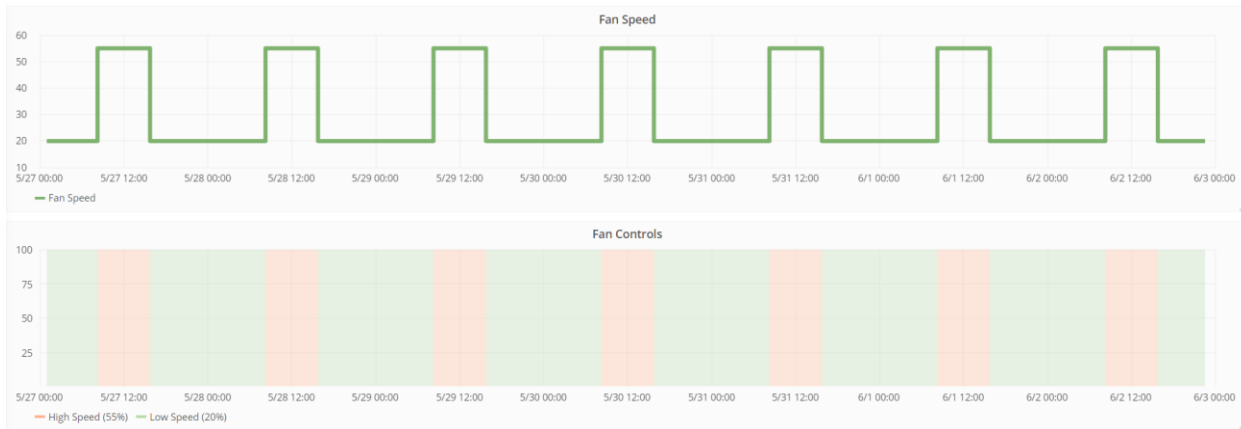
13 May to 19 May 2018



20 May to 26 May 2018

# Fan Speed Report

-- PocketHerbs --



27 May to 2 June 2018



Southern Cross Plant Science

Planning Committee  
Tweed Shire Council  
PO Box 816  
Murwillumbah  
NSW 2484

Friday Nov 9, 2018

To Whom It May Concern:

Southern Cross Plant Science at Southern Cross University is collaborating with Pocket Herbs on an R&D project looking into the development of a sustainable local Bush Food Industry. Pocket Herbs, with SCU as the service provider are in the process of applying for a NSW Tech Voucher to support this research. The research will involve the propagation of plants (listed in the Annex on page 2) under greenhouse conditions to determine best practice for producing high yield and quality. This work is ground breaking as only a small number of these plants have been successfully propagated in a commercial environment and the ability to propagate on a commercial scale will more importantly take pressure of natural populations which are currently being over foraged to meet consumer demand.

SCPS strongly supports the request that the planning committee approve the application to allow operation of Greenhouse 2 as soon as possible so this collaborative research can move forward.

Yours Sincerely,



**Assoc. Prof. Bronwyn J Barkla**

**Director**  
Southern Cross Plant Science

**T** +61 2 6620 3159

[www.scu.edu.au](http://www.scu.edu.au)

**Lismore**  
PO Box 157, Lismore NSW 2480 Australia  
**T** +61 2 6620 3000 **F** +61 2 6620 3700

**Coffs Harbour**  
Hogbin Drive, Coffs Harbour NSW 2450 Australia  
**T** +61 2 6659 3777

**Gold Coast**  
Locked Mail Bag 4, Coolangatta QLD 4225 Australia  
**T** +61 7 5589 3000 **F** +61 7 5589 3700

Annex 1. List of Plant Species to be trialed in Green House 2

**NATIVE:**

*Apium prostratum var. filiforme*  
SEA CELERY

*Atriplex nummularia*  
SALTBUSH

*Disphyma crassifolium ssp. clavellatum*  
KARKALA

*Portulaca oleracea*  
PURSLANE

*Sarcocornia quinqueflora*  
SAMPHIRE

*Sesuvium portulacastrum*  
SEA PURSLANE

*Suaeda australis*  
SEABLITE

*Tetragonia tetragonoides*  
WARRIGAL GREENS

*Mertensia maritima*  
OYSTER LEAVES

*Mesembryanthemum crystallinum*  
ICE PLANT

**Peter Hardwick,  
Wild Food Researcher,  
20 Pine Mountain Road,  
Possum Creek,  
NSW, 2479.  
Mobile: +61428385991  
Email: [hardwickpl@hotmail.com](mailto:hardwickpl@hotmail.com)**

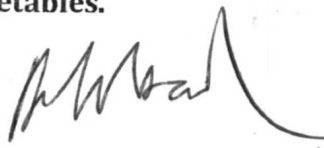
**Planning Committee,  
Tweed Shire Council,  
PO Box 816,  
Murwillumbah,  
NSW, 2484**

**To Whom it May Concern,**

**I am currently advising Pocket Herbs on the selection of native food species to commercially trial in their greenhouse production operation. I supply native foods to restaurants and the demand is increasing. To meet this growing demand we need production horticulture for reliable and sustainable supply. Ultimately there is the distinct possibility that native vegetable production will develop into an industry, and I think that Pocket Herbs are playing a vital role in that development and it's important that this initiative is supported.**

**Pocket Herbs is also collaborating with Southern Cross Plant Science, which shows the extent of their commitment to doing this venture properly.**

**I fully support the request for the approval by Tweed Council of Greenhouse 2 because of the importance of this project in supplying native vegetables.**



15/11/2018.

**Yours sincerely,  
Peter Hardwick,  
Wild Food Researcher.  
+61428385991**