



National Vegetable Extension Network

VegNET
NORTHERN TERRITORY

**CASE
STUDY**

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Hydroponic trial proves feasible for cucumber production in the NT

Introduction

Protected cropping and hydroponic systems have provided the Northern Territory's horticulture industry with an opportunity to diversify its market and grow produce that otherwise would not survive or grow as well in a conventional farming system.

In a VegNET NT survey of vegetable growers in late 2023, protected cropping was one of the most requested topics for VegNET to focus on in 2024, with farm trials highlighted as a popular method for information to be shared. This was consistent with the feedback received from growers in late 2022.

Hydroponics are common practice across Australia in 2024, but are still a relatively new farming opportunity in the NT. While growers can access ample information on hydroponic systems across Australia, including what they look like and how they work, there are limited resources available for hydroponic systems that are best suited to the NT. Leading experts and suppliers of hydroponics are also not based in the NT or northern tropical Australia. Therefore, access to consultation is limited in the NT.

Certain growers have used their skills from other areas to become the early adopters of hydroponics in the NT, having found a system that works well for them. It is, however, not the early adopters' responsibility to educate other interested growers who could then use this information to produce a competitive crop for the same market.

Key messages

- There is currently minimal information available to vegetable growers in the Northern Territory who are looking for guidance on growing in a hydroponic system tailored to the NT's unique climate.
- To address grower interest, VegNET NT developed a demonstration site that used a simple, entry level hydroponic system to trial three rounds of cucumber plantings. The performance of the hydroponic system was compared with the grower's existing production system which used potted soil and fertigation.
- During the trial, VegNET NT facilitated grower visits to the demonstration site and produced grower resources including information sheets and videos.
- Following a series of learnings and insights, the final trial using hydroponics produced higher quality cucumbers that could be harvested earlier. The grower is now looking to convert to a hydroponic production system.

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Trial approach

A demonstration site showcasing the concept of a simple, entry level hydroponic system was designed in 2023. It involved working with a local grower who was either interested in getting into hydroponics or was in the early stages of growing hydroponically.

VegNET NT planned to work with the grower to trial a simple system and, after the demonstration site was completed, the grower could decide if the set-up was feasible. The other important aspect of the demonstration site was to share the trial findings with as many growers as possible. This included grower visits to the site, informative flyers, informative videos and social media content.

The hydroponic trial was based at Acacia Hills. It took up one row of a shade house and was planted alongside the grower's current system, which used a potted soil mix with a fertigation system where the grower would fertigate every few days.

The hydroponic trial involved three sets of cucumber plantings. The first planting had system teething problems which resulted in many learning opportunities. For example, setting up tanks and dosage pumps to achieve an electrical conductivity (EC) reading in the correct range, ensuring the pumps have enough pressure to work correctly and fine tuning the watering schedule to achieve approximately 20 per cent drainage. Despite sufficient preparation and planning, the first planting was a reminder that even though a system may be 'textbook correct', it may still require adjustments when implemented on farm.

The second planting, which was later in the dry season of 2023, experienced high pest pressures (two-spotted mite in particular) which significantly impacted the crop. An integrated pest management (IPM) approach was implemented, however the team was not prepared enough to successfully manage the mites.

The third planting took place in the early dry season of 2024. This crop was very successful with a well-established and managed hydroponic system, IPM program and healthy crop. The pest pressure was lower due to time of season, however an IPM program was implemented from a very early stage.

Throughout the second and third plantings, two grower walk-throughs took place where growers could visit the farm at specific times. An information sheet and two 5-minute informational videos were also produced. These extension methods aimed to increase grower knowledge of what a simple hydroponic system can look like in the NT and how to manage it.

Improving grower productivity, profitability, preparedness and competitiveness

A key outcome from the demonstration site was the change in the host grower's knowledge and understanding of hydroponic systems. The grower contributed to the set-up and management of the hydroponic system and made their own conclusions of how effective the system was and what they would like to adopt after the trial was completed.

The grower thought the coco-coir bags, although more expensive than potted soil bags, were more efficient to set up and appeared to use less water and nutrients. They also saw how the dosage pumps were more efficient and effective than a conventional fertigation system. The cucumbers in the hydroponic system trial were visibly higher quality and ready to harvest five days prior to the original production system which was planted at the same time.

Due to these observations, the grower has decided to switch their entire shade house to coco-coir for the dry season and use a dosage pump and tank system for consistent fertigation of the crop. The grower hopes that these changes will ultimately improve their productivity and profitability.

"I think the plants in the hydroponic system grow better and healthier," the host grower said.

"I will change my system to hydroponics with the coco-coir because I use less fertiliser and it's less work for me because everything is automatic."



Image: VegNET NT Regional Development Officer Mariah Maughan with the hydroponic system (left) and the conventional system (right) at the demonstration site.

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Final word

The hydroponic demonstration site was successful in providing several resources to growers on how a simple hydroponic system could work in the NT and how to manage it. The trial also highlighted the benefits of using a coco-coir medium and dosage pumps to improve productivity and profitability.

Using a broader lens, the trial did uncover the lack of research on best practice in hydroponics in the NT from a production and profitability standpoint. Growers have established what works best for their individual property, but research into best practice is a significant gap. There is great opportunity for the NT and much to learn.

Further information

Contact VegNET Northern Territory Regional Development Officer Mariah Maughan at ido@ntfarmers.org.au or 0417 618 468.

A simple example of a hydroponics system in the NT information sheet: [English](#) and [Vietnamese](#)



Image: The VegNET NT hydroponic trial showcased a simple user-friendly system suited to the Northern Territory climate.



Image: The hydroponic trial three weeks after planting seedlings.

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