

OF HYDROPONICS

Sweet Taste of Success

Strawberries and more strawberries
(plus strawberry ice cream!)

I just love this job! Every time I visit a new site I meet up with great positive people, I learn heaps and hopefully have been able to pass on some useful information for both hobbyist and commercial growers.

Last issue I reported on a young couple who started to grow and then developed their marketing strategy. This month I am going to report on an operation that had its roots in marketing and then later developed into growing and much more.

I am truly blessed to be living in New Zealand, such a beautiful country. This time I ventured out to a headland that offered the most amazing views. Unfortunately, the tide was nearly at its lowest ebb during my visit, yet still it was an enchanting view. But to the story!

Robin Hedges—who for the rest of this story will be called by his nickname Noddy—comes from true farming stock. His dad John has a solid background in pastoral farming with over 55 years of practical hands-on experience in grassland animal production. Our story starts some 10 or so years back when the family purchased an orchard and started fruit-growing. Being a little disenchanted with the marketing arrangements for the orchard



Above: Here Noddy checks the crop after the pick has been completed. The system sees stout wooden posts with 4-by-2-inch (100 mm by 50 mm) PVC hydroponic gully strapped either side of the posts with alternate slope (fall) to allow maximum light to reach all plants. The supply pipe can be seen at the top and the return to holding tank drains at the bottom. *Below left:* The rich red color and high gloss skins indicate superior quality berries. *Below right:* The growing area now covers 1.25 acres and holds 75,000 plants.



produce, Noddy thought, Why don't I get a truck and take our produce to the people?

For the next two years Noddy drove one and a half hours each way, every day, from the orchard to the nearest city of Rotorua. In no time at all he was supplementing sales of their orchard produce with that of other growers. Soon he had a thriving and profitable retail operation, to the extent that he set up a depot in the city to save on the daily travel.

For the next five and a half years he worked the truck from the depot. He became such a landmark in Rotorua that the local tourist department featured a cartoon of his truck in the local tourist guide. I guess Noddy had plenty of time to think up schemes, and one day in the lead up to Christmas he decided that there had to be

money in growing strawberries, since they were such a good seller from his truck.

After lengthy discussions with his father, whose understanding of farming in the soil was second to none, Noddy decided to find some land somewhere with a climate that favored the unprotected growing of his chosen strawberry crop.

Soon he found a block of land on the outskirts of my home city of Tauranga. Having made the decision by virtue of putting his money into the land, it was now time to sell his very profitable fruit and vegetable business and move to the new Tauranga location. This was all achieved in a short time, and soon Noddy and father (with support from his mother) planted 65,000 strawberry plants into 2.5 acres of soil.

Noddy Goes Hydro

After two years of back-breaking and sometimes disappointing results of growing strawberries in the soil, they decided there had to be a better way. The site location seemed pretty good, and there was no doubt, judging by the demand, that they had been producing a pretty good product.

While they had a good and proven record as growers in the soil, they knew absolutely nothing about the technical requirements of hydroponics. Yet it was now their firm belief that hydroponics had to be better than growing in the soil. They figured that if they grew the plants off the ground the product would be cleaner. They also saw the advantages of getting light and a flow of air through the plants which would promote good health and definitely



Above: The fruit sales shop is at the front of the factory and to the left is the ice cream parlor. Below left: Every section of the installation is numbered to allow speedy attention to any problems in a specific area. The numbering system also allows for an efficient work plan to be adhered to. Below right: The pump room is set up inside an old shipping container. The two large tanks at the far end hold the A & B concentrates with the pH correctors in the two square drums just in front. Three American Dura-Glas Sta-Rite pumps circulate the nutrient to the crop. In my opinion these are the best hydroponic pumps in the world.



reduce to a minimum the potential for fungal attack. Anecdotal evidence was also telling them that they could provide the optimum feeding regime for their strawberries by growing in a hydroponic system.

They devised their own system, then built it all themselves. The hydraulics of the system worked well, but it wasn't until they started growing that the problems began to appear. The first problem was that because the growing holes had to be big enough to be able to remove spent plants from the system, too much light was able to enter the gullies and grow algae (slime). This would build up and block microtubes and gullies. The installation only covers 1.25 acres (half the previous soil-growing area) but now holds some 75,000 higher-yielding plants, so silly problems such as blockages are the last thing a grower wants to be worried about. They have come up with several methods of reducing the problem and have a plan which will all but eliminate algae growth.

A healthy NFT gully requires a free flow of clean air through it to expel any waste gases coming from the roots, so it is a balance between allowing this to happen while at the same time inhibiting light from contact with any nutrient. The second problem was that the site does get quite strong wind from time to time, with the one boundary being directly exposed to several miles of open estuary. They got over this problem by physically clipping each plant in its hole with a plastic clothes peg.

Initially, they purchased a proprietary nutrient feed that proved to have some shortcomings, so they employed a consultant to come up with a formula that would be tailor-made for their system and location. Once this was achieved there was no stopping the plant growth and production grew rapidly while at the same time their high requirement for quality was maintained and now even improved.

Noddy and John are joined by one other to provide three permanent workers to the site. They also employ four part-timers, mainly for picking duties. The fruit are picked and packed straight into 800-gram punnets (about 28 ounces), so the pickers also become the graders and packers. The



Above: Noddy keeps a cleaned cartridge ready to aid rapid replacement to avoid any shut down delay to the system when a filter needs cleaning. Below left: Diesel-powered standby alternator. Noddy produces beautiful natural strawberry ice cream with this ice cream machine.



punnets are then packed into stackable crates. Each crate is then weighed upon return to the processing shed and prior to entering cool storage before distribution. I cannot tell you what the annual yield from the hydroponic system is (bit of a trade secret). However, the last soil-grown crop produced 40 tons of saleable product.

All of the strawberry crop is sold at a shop on the farm, which also serves as an outlet for neighboring farmers' products such as blueberries, kiwi fruit, etc.

Sweet Treat

Noddy is very particular about quality. Not all product picked is ever going to be of saleable quality. So what do you do with a strawberry that has a brown spot on it or is badly disfigured due to flower damage or poor pollination? When they were growing

in the soil this was a small but significant loss potential. That got Noddy's dad to thinking and he came up with an answer—strawberry ice cream! So right next door to the fruit sales shop they built an ice cream parlor. The concept is that all damaged fruit is processed in the factory, with any imperfection discarded and the remaining sound fruit pieces frozen. These pieces are then added to plain ice cream and mixed in a purpose-made machine to produce ice cream treats. This maximizes returns from the strawberry farm.

Back to Growing

The system is conventional NFT and comprises 30 rows of plants held in 15 km (9.32 miles) of PVC gully into which have been drilled the 75,000 growing holes. A large tank can hold most but not all of the



Clockwise from top left: Cabbage still growing in the NFT gully. First we cut the cabbage stem. Sometimes you may need to use a small saw rather than a knife! Then the plant-holding lid is removed. These are made from off cuts of gully. Heat one side with a hot air gun until soft and pliable and then force fit it over the top of the growing gully. Full-length of root material pulled from a gully.



nutrient in the system, so to both protect the crop and to hold the nutrient charge a 10 Kva standby diesel generator has been provided in case of a power failure.

There is no end to innovation on this site. When it came to setting up the pump room, Noddy was not sure whether the location was going to be good, long term. So he purchased an old shipping container and fitted it out as the nerve center and pump room. Not only does this provide great security once the doors are closed but it also means that he only has to cut the connecting pipes and can then relocate the whole pump room to a new site, if required. Rumor has it that this business is going so well that they may be forced to change things around to accommodate more growing structures!

The system operates on the standard A+B nutrient principle. Two large tanks hold the A and B nutrient concentrates.

Two smaller drums hold the pH correctors, phosphoric acid and potassium hydroxide. All these additives are pumped upon demand via peristaltic pumps to the main holding tank. The nutrient formula is blended on-site from raw materials, and Noddy has invested in high-quality digital scales to accurately weigh the constituents of the formula.

The nutrient is pumped out to the crop by three pumps via disc-type in-line filters. These remove any organic material that enters the system, and they need to be cleaned on a regular basis to ensure good delivery pressures across the whole site. The whole system has been plumbed in three sections which presently all run from a common tank. However, at any time it could easily be split up into three separate systems. They might do this if, for example, they grew a variety that needed a different formula or different conductivity or pH

values.

It is important to keep the site clean, and Noddy makes sure that the grass is kept trimmed to reduce the potential for providing a home for pests. The only protective spray that's required is an occasional fungicide to combat the fungal disease botrytis. Interestingly, the prevalence of attack has dropped markedly since getting the crop up off the ground. This has also been noted by other growers of crops such as lettuce and herbs who have switched from growing in soil to bench-type hydroponic growing systems.

I have said many times that the biggest challenge in growing is in crop management, not in operating a well-designed hydroponic system. In this instance, where we see such a wealth of growing knowledge held in the wise head of Hedges Sr. coupled with the enthusiasm and competence of Hedges Jr., then success is just a natural progression. It is so refreshing to collaborate with two such positive and down-to-earth guys in this age where political correctness is out of control.

Rob Shows Us How

I thought I was finished telling you about home crops when I was recently asked a simple question that deserves some explanation. When growing cabbages and the like, how do you get all those roots out of the gully without a major battle? Well, I have touched on this previously. However, let us look at it again. In order to make it easier I have taken some step-by-step photos that should assist in understanding the simple principle involved. Also, remember the problem with light getting into the strawberry gullies? This is another way of overcoming this problem.

The cabbages are grown in 6-by-3-inch (150 mm x 75 mm) PVC NFT gully and the system operates at 16 CF and 6.3 pH. The secret is to design home systems so that you can easily remove one plant at a time and then replant that hole within minutes so that a steady supply of produce is available. 🍃

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