

**Integrated
Crop Protection**

PROTECTING CROPS



Soil Wealth

NURTURING CROPS

Three Vital Practice Changes at Rob Hinrichsen's Kalfresh: A Case Study

Overview

Six years ago, Rob Hinrichsen and his team at Kalfresh decided to focus on four key practices – controlled traffic, cover crops, soil biology and compost – to improve the soil health across their farms. The main drivers were to improve crop yield and quality, as well as the sustainability of the business.

“Modern agriculture with large tractors, excessive tillage, and heavy reliance on ag chemicals just doesn't give soil fungi a chance,” Rob said.

“Fungi are a very important part of the soil biology and by making our own compost, controlling traffic and reducing tillage we've been able to reintroduce fungi to our farms and farming systems. Now when we go to our soils and open them up we can see the strands of hyphae running through the soil, and that has been very gratifying.”

Change #1: Controlled traffic

One of the first things Rob and his team tried six years ago was to control traffic, to delineate driving zones from growing zones.

“We played around with a little single row implement and trialled it on all our crops for a year to prove the concept. We quickly learned our clay-based soil really responds to not being driven on,” Rob said. “Of all the changes we've done on the farm, controlling traffic to avoid tyre compaction has been the biggest wow factor, as far as an immediate result is concerned.”

Rob soon saw other benefits that flowed from controlling traffic. “One of the spin-offs is reduced tillage,” he said. “In the old days we used to go across our farm eight to eleven times, whereas nowadays it is three, max. Sometimes it is only once, depending on the crop. This has led to a huge saving on diesel, manpower, and even the size of our tractors has gone down.”

According to Rob, controlling traffic and reducing tillage has made the whole system a lot simpler. While it was not

cheap to make equipment changes for controlled traffic, the change was well worth it in the long run.

Watch the ‘Controlled traffic in vegetable production: a grower's perspective’ video here: <http://www.soilwealth.com.au/resources/videos-and-apps/controlled-traffic-in-vegetable-production-a-growers-perspective/>



Figure 1: Precision seeder

Rob uses equipment like a precision seeder set up to run on a controlled traffic system (Figure 1). The tractor wheels always run on the same tracks and never on the beds where crops will be growing.

Change #2: Cover crops

Rob understands and maintains good crop rotations across his farm. Cover crops are grown methodically and strategically to suit the time of year, what he wants the cover crop to achieve, and enhance the system overall.

“Onions followed by carrots is a good rotation for us. We're going to enhance that by putting in a tillage radish and lablab bean cover crop. The radish can bust through hardpans and hard soils, recycle nutrients from depth, and the lablab is a nitrogen fixer, plus it helps bulk up the organic matter.”

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Watch the 'Cover crops in vegetable production: a grower's perspective' video here: <http://www.soilwealth.com.au/resources/videos-and-apps/cover-crops-in-vegetable-production-a-growers-perspective/>



Figure 2: Tillage raddish cover crop

Rob Hinrichsen at Kalfresh strategically grows cover crops to suit the time of year. He prefers sunn hemp, sorghum, and millets for the warmer months, while in cooler months he switches to barley, ryegrass, and field peas (Figure 2).

Change #3: Compost

Rob's advice to others who want to see returns by adopting soil-health practices is to start small and to learn as you go along. "Educate yourself on composts and what's happening in your soil. Every location, every farm tells its own story, because every soil (and compost) is different."

Watch the 'Compost use in vegetable production: a grower's perspective' video here: <http://www.soilwealth.com.au/resources/videos-and-apps/compost-use-in-vegetable-production-a-growers-perspective/>

Rob Hinrichsen inspects the progress of the rows of compost he makes on the farm and applies to crops at rates between 2-4 tonnes per hectare (Figure 3).

With lots of learning, trials and changes, Rob now makes two different composts. His short-term compost, about 5 weeks of thermal composting, using spent mushroom compost as a base, has mostly replaced mineral fertiliser.



Figure 3: Inspecting compost on-farm

Made on the farm, short-term compost is a high analysis, micronutrient rich fertiliser applied at precision rates for specific crops. Long-term compost – approximately 9 months of thermal and stable composting – is made from wood chips and onion waste, a fungi-dominant compost used as a soil restorer that is generally applied to underperforming or problem paddocks. It is used following carrot harvests which negatively impacts soil structure and soil fungi.

"We need to have our soil at a certain tilth and quality before we can plant it," Rob said. "We find that we get to that place far quicker when we use controlled traffic, compost, and cover crops."

Over the past five years Rob has seen soil carbon levels increase almost 1%, and increased resilience in crops during periods of stress.

Key messages

In summary, Rob's emphasis on softer tillage, boosting organic matter with compost and cover crops has helped the soil recover and support a healthy population of beneficial soil organisms. Rob supplements the naturally occurring biology by using specific beneficial organisms such as *Bacillus subtilis* to improve the robustness of his farming system.