as seen in...
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HELICROPPING – FROM 'SPRAY AND PRAY' TO AERIAL NO-TILLAGE

USING HELICOPTERS TO ESTABLISH AND CARE FOR CROPS BEGAN AS TRIAL-AND-ERROR EFFORTS BY SEVERAL KIWI HILL COUNTRY FARMERS MORE THAN A DECADE AGO. IT NOW HAS BECOME A SERIOUS COMMERCIAL TOOL TO MANAGE FORAGE CROPS AND RESTORE PASTURE WITH IMPLICATIONS FOR OTHER SECTORS OF THE AGRICULTURAL INDUSTRY.

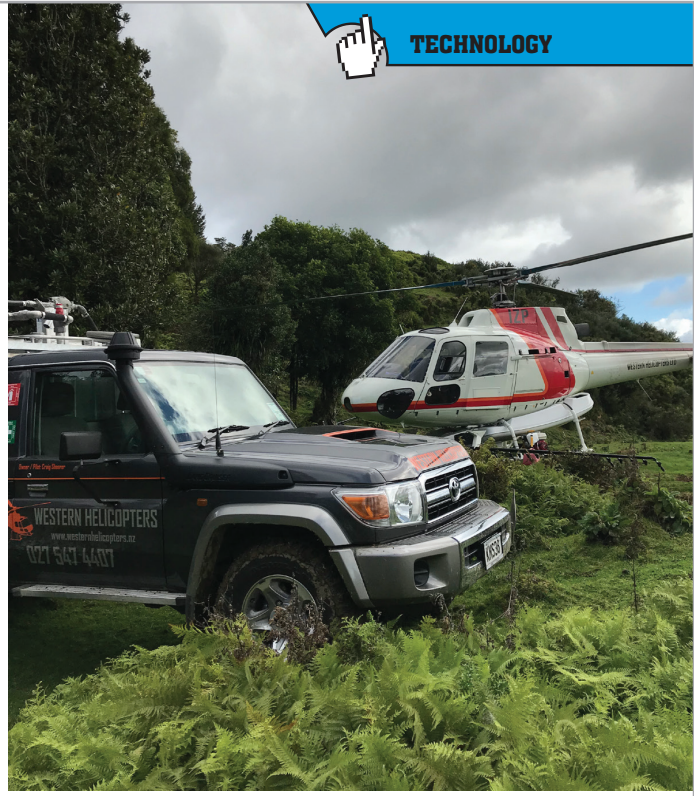
Proponents call the practice helicropping or aerial no-till. They argue that it can be as effective (and cost-effective) as conventional cultivation as a means to deliver seed, fertiliser and herbicides, and it gives the bonus of leaving the soil's physical structure intact.

Helicropping makes it feasible to grow forage crops and improve poor fertility browntop pasture in otherwise inaccessible rolling hill country. Like no-till, it provides a means to establish crops while preserving soil structure and protecting vulnerable soils.

Researchers say helicropping's potential is large but that a careful case-by-case approach is needed. They are now looking at ways helicropping can be used beyond its original applications in hill country.

These include on rolling and flat country, timely sowing winter catch crops on paddocks that are too wet for tractors, or even establishing native trees on hill slopes.

Last year, a Ministry for Primary Industries - Sustainable Farming Fund (SFF) research project was set up to study sustainable helicropping, particularly looking at mitigations to protect the soil. Before this, an informal group of North Island farmers met to share information about their progress in refining the practice.



A HELICOPTER EQUIPPED WITH A SPRAY RIG, WHICH CAN BE USED TO APPLY GLYPHOSATE OR INSECTICIDES.

They were supported by Balance Agri Nutrients, Beef &

HELICROPPING WAS USED TO RESTORE THE PASTURE ON THIS HILLSIDE. THE FIRST STEP (LEFT) WAS TO REPLACE THE EXISTING PASTURE WITH A BRASSICA CROP THAT WAS GRAZED TWICE AND THEN REPLACED WITH GRASS (RIGHT).

Lamb NZ, Agricom, PGGW Seeds, NuFarm and Bay of Plenty Regional Council.

Ballance forage specialist Murray Lane served as an unofficial advisor and sounding board for the group and other researchers helped with sediment monitoring.

A number of independent helicopter operators worked with the farmers to develop the technology to make helicropping feasible. Their confidence in the practice has grown to the point where they regularly use it to establish summer and winter crops and oversow pasture.

Murray says he knows of four helicopter contractors in South Waikato who do helicropping, one in the Rangitikei and another in Taranaki. There are also others looking at it in the South Island.

"We have many farmers who are very happy with the results. One farmer used to supply store lambs but by sowing his hillsides with clover he is now able to provide finished lambs direct to the processor. It has made his operation more profitable.

"We are now familiar with the process. We understand the risks and what hiccups can occur. It is important not to cut corners either during establishment or grazing. We have identified the steps that must not be short-circuited to ensure success."

Sprayed out pasture creates a good microenvironment for establishing a crop using helicropping. The dead grass does not remove moisture from the soil and it protects the seeds from wind and sunlight.

Successful helicropping requires adding significant fertiliser. Controlling against weeds, and protecting against slugs, snails and springtails is another part of the equation.

Murray says, ideally, spraying would be done with accurate Accu-Flo nozzles, which allow targeted aerial spraying to keep the spray within the target paddock.

"Getting these steps right was an important part of developing a practical system. Spreading swede seed at 1.5 kg/ha is quite different to spreading fertiliser at 500 kg/ha. Different products have different ballistics and spreadability.

"It may be possible to spread seed and slug bait together, ideally as a double pass, but fertiliser generally has to go on with a separate pass. Individual contractors are working out the right calibrations for their hoppers and how to mix and apply the products effectively."

Murray says farmers who want to use the practice need to consider a number of variables to ensure success and minimise damage to their soils.

"Variables include the slope of the ground where the crop will be established, the crop they intend to grow, when it will be planted and grazed, and the animals that would be grazing it.

"Grazing two-year-old cattle on a swede crop on a 40 degree slope in the middle of winter will have a much bigger impact than finishing lambs on a plantain and clover crop on the same in rolling country," he says.

There are a number of different scenarios where helicropping can be used in hill, rolling and even flat country.

One option to renew pasture, for example, is to put in a rape crop, graze it twice and then oversow perennial pasture seed. This means the final winter grazing of rape will be done with a well-established pasture at its base.

Another pasture renewal programme is to sow a crop of swedes in the first year, follow that with a cover crop, and then with a crop of kale in the second year. After this, it can go back into perennial pasture. The multiple herbicide applications give better control of perennial grass weeds.

The cropping phase can be used to build up soil fertility and remove weeds and poor pasture species before going back into grass and clover.

Field tests have shown when establishing forage crops using helicropping the more N and P that is available to the young plants, the better the seedlings will grow. This gives faster canopy closure, weed suppression and, ultimately, a higher yielding crop.

The SFF project is looking at other options to mitigate the effects of grazing. One scenario is to sow a grass seed cover crop immediately after grazing in winter. Species selection, seed loss to birds and the benefits of DAP are being evaluated.

Murray says another scenario being evaluated is to oversow grass into the standing forage

INDIVIDUAL HELICOPTER CONTRACTORS HAVE WORKED OUT THEIR OWN SYSTEMS TO SOW CROPS AND SPREAD FERT AND SLUG BAIT.