

IntelliSpread (

Precise variable rate application

Waste less. Lower your environmental footprint

aprowork



IntelliSpread® - right rate, right place

| Intellispread - transforming topdressing | 4 |
|--|----|
| How does IntelliSpread work? | 6 |
| Case study: Striking the balance | 8 |
| Glossary of terms | 10 |

IntelliSpread[®] - transforming topdressing

The smarter way to realise the full potential of your hill country farm

Through its computercontrolled precision aerial application, Ravensdown's IntelliSpread system will enable you to:

- 1. Optimise production
- 2. Waste less
- 3. Reduce your environmental impact

On successful completion of the research phase, IntelliSpread will be the only fertiliser delivery system with AirScan[®] remote sensing and placement verification technology.

What can IntelliSpread do for me?

Using your digital farm map eg HawkEye, IntelliSpread ensures that the right amount of the right fertiliser is placed where it's needed instead of where it's not.

Boundaries

IntelliSpread technology enables boundary recognition to ensure that fertiliser is not applied where aerial spreading would be wasteful or environmentally unacceptable.

Variable rate

The IntelliSpread system varies the rate of fertiliser applied through computercontrolled hopper doors that are working to a prescription map which has been wirelessly uploaded to the plane.

How do I know where the fertiliser has been applied?

For auditing and planning purposes, Ravensdown's Placement Verification Technology (PVT) will provide a graphic overlay to the HawkEye^{*} system.

This is important for your records and for future compliance purposes.

PVT will differ from other options because "proof of placement" with other aerial spreading services only means proving that the hopper door opened when it should.

By contrast, Ravensdown's placement verification technology will account for:

1. Plane speed

2. Product ballistics* (size and density).

*When fully implemented

Soil diagnostics

As the world-leading Air Scan[®] technology becomes validated, IntelliSpread will become the most accurate aerial fertiliser application and verification system available.

OLD APPROACH

'BLANKET' APPLICATION

Figure 1: Aerial top dressing

Using farm imagery to drive the application, thus avoiding topdressing environmentally sensitive or nonproductive areas of your farm such as swamps, ponds, forestry blocks and steep faces. You can redeploy, on average, 15% of your fertiliser. You can then invest this back into more productive areas of your farm.

Figure 1 shows current practices and Figure 2 shows what Ravensdown's Intellispread[®] technology offers through variable rate application and farm imagery.

redeploy 15%

of your fertiliser

IntelliSpread 👘

VARIABLE RATE APPLICATION

Figure 2: Variable rate application driven by farm imagery.



Exclusion zones are zones avoided during variable rate application by using more detailed data.



How does IntelliSpread[®] work?

The advantage of IntelliSpread[®] is the automated and wireless way all the files and maps can be handled for a convenient and straightforward process.

DecisionDynamicPlacementsupportdeploymentverification

With your agri manager, the farm is split into blocks and zones, using OVERSEER and other decision support tools such as HawkEye to work out the best rate and areas to apply phosphate, potassium, nitrogen and sulphur.

Choose between the standard service for automatic, map-driven door open / door close instructions or choose the advanced IntelliSpread precision application service.

The full service uses IntelliSpread technology but also allows for variable rates of fertiliser. This targets capital fertiliser where there will be a benefit and reduces or withholds fertiliser applications without compromising production.

J.L.

When you need a visual record of where the fertiliser has been applied, IntelliSpread placement verification will be ideal.

The simple graphic will be based on complex calculations and calibrations that account for product ballistics and speed.*

*When fully implemented.

Case Study: Striking the balance

Ensuring efficient and sustainable use of nutrients is paramount for Māori farming group Ātihau Whanganui Incorporation (AWHI).

One of their sheep and beef properties, Ohorea Station near Raetihi is a 4,300ha property spanning rolling to steep hill country in the Parapara ranges. The station is both a research and focus farm for Ravensdown and the Ministry for Primary Industries (MPI) Primary Growth Partnership (PGP) 'Pioneering to Precision' (PP) programme.

The PP initiative has been working to improve the productivity of hill country sheep and beef farming through efficient use of fertiliser since 2014.

GPS-guided aircraft use remote sensing to establish the nutrient status of the soil and determine where nutrients should be targeted, avoiding critical areas such as waterways and stands of native bush, of which Ohorea Station has many. AWHI CEO Andrew Beijeman says the key to maintaining a business that aligns with AWHI's strong environmental stewardship principles is finding the sweet spot between economics and sustainability.

"It's about striking the balance – reducing our impact environmentally whilst still getting better production out of the farms," he says.

"We want to use the same amount in inputs in a much more effective way, which is where working with Ravensdown on the PGP and IntelliSpread comes into it. Doing things the right way with individual treatment rather than a blanket approach, and using information to get a better result, which in the long run is more cost-effective as well." Ohorea Station Manager Rex Martin says "I was mildly sceptical of the technology at the start, but I've been impressed with the way the maps accurately reflected the nutrient status of the soils.

"I had been here long enough that I knew what country was good and what was poor, and the maps were telling me exactly what I knew. It was actually really quite good!"

Andrew says the PGP and IntelliSpread service has been a great initiative for AWHI.

"Really it's about looking after what we do on our land and that is a big part of where the PGP comes in," says Andrew.

"It's not just about the plane with the sensor that can soil test every square metre...it's about the maps which indicate where the sensitive areas are, so that we are not putting fertiliser on those areas, and also about the smart plane technology turning it on and off at the right time." "I was impressed with the way the maps accurately reflected the nutrient status of the soils."

Rex Martin, Ohorea Station Manager

Glossary of terms

Coefficient of variation (CV%)

Is the ratio of the standard deviation over the mean and is used to indicate the evenness of spread. A CV% of zero would mean perfectly even spreading with the applied fertiliser rate matching the target rate perfectly.

IntelliSpread[®]

The means by which a prescription map is loaded into the aircraft GPS which then communicates with a computer that controls the opening and closing of hopper doors. The doors are automatically operated to precisely apply a rate of fertiliser so it gets to where it is needed and at the rate required. This has the added benefit of not distracting the pilot.

IntelliSpread can exclude noneffective areas across a farm thereby improving the efficiency of fertiliser and/or exclude buffer zones which minimises the risk of fertiliser being applied to at-risk areas such as waterways. Another important feature of IntelliSpread is that, within a block, the hopper doors will automatically adjust depending on the planes ground speed (such as experienced when a top dressing plane climbs) to maintain the application rate as close to the target rate.

PGP - Primary Growth Partnership

PGPs are a shared investment between the New Zealand government and industry to make step-wise advances in the primary industries. Ravendown's PGP project is referred to as "Pioneering to Precision" and is aimed at transforming topdressing by focussing on remote sensing soil fertility. The aim being to develop more targeted variable rate fertiliser applications to hill country to reduce waste for farmers and reduce the environmental impact. In a supporting project which is fully funded by Ravensdown, new aircraft spreading technology has been introduced to support the improvement of fertiliser application to hill country.

Prescription map

This is a map which is loaded into a topdressing plane's GPS unit which describes the fertiliser application spatially. It includes boundaries of farms, blocks and paddocks within the farm which may contain different fertiliser rates and highlights ineffective areas or buffer zones which are to be excluded from fertiliser application.

Placement verification

A visual record of where the fertiliser has been applied on a farm map. The IntelliSpread system in fertiliser application trials has been shown to reduce the coefficient of variation (CV) from 78% without the system to 42%, which is closer aligned with CV values found in ground spreading.

Placement Verification Technology (PVT)

Currently the maps produced from aerial application show where fertiliser is released from the aircraft. This is a very good starting point for providing on-farm traceability and records. In the future, as the supporting science develops, it is envisaged these maps will take into account wind conditions and product ballistics to more accurately map where the fertiliser lands.

Variable rate application

This describes the process of applying fertiliser to effective areas of pasture and at different rates to different blocks. The aim is to optimise the pasture production based on potential of the different blocks to grow more, while accounting for farm economics ie will fertiliser applications be profitable? Recent analysis of four farm scenarios has shown a compelling value proposition of an average \$43/ha gain in favour of variable rate applications compared to a blanket fertiliser application, with a range of \$21 to \$79/ha.



0800 100 123 ravensdown.co.nz

V0119