Case study:

Page Bloomer significantly boosts efficiency with SouthPAN

The Challenge

Global Navigation Satellite Systems (GNSS) are commonly used to support a wide range of agricultural processes, including precision planting, spraying, fertilising, and harvesting. Standard GNSS positioning, such as GPS, are accurate to about 5-10 metres, making it unsuitable for many applications. High-end GNSS equipment and services, such as Real-Time Kinematics (RTK), are capable of centimetre-level precision, can be cost-prohibitive and surplus to requirement. Page Bloomer have faced challenges locating points of interest across multiple hectares of their research sites, especially as conditions change over time, often obscuring any visual markers. Reliability and repeatability are a priority for precision agriculture but without a cost-effective and accurate alternative to standard GPS or RTK, means there is a gap for many agriculture operations that can limit their access to precision agriculture capabilities and its benefits.

A SouthPAN enabled receiver is used to locate sampling points in maize crops, often growing up to 3 metres tall.

The Solution: SouthPAN

The Southern Positioning Augmentation Network (SouthPAN) is a free positioning system that improves the accuracy, reliability and availability of Global Navigation Satellite Systems (GNSS), such as GPS, from 5-10 metres down to less than a metre, and in some cases as little as 10cm, across New Zealand and Australia.

SouthPAN provides corrections for common error sources in GPS signals and delivers these corrections via satellite direct to compatible receivers, improving positioning accuracy to less than a metre, and in some cases as little as 10cm. By delivering these correction signals direct from a satellite, SouthPAN is able to overcome gaps in mobile, internet and radio communications. Following a successful trial phase from 2017-2020, SouthPAN's early open services have been live since September 2022 and are available now.

Page Bloomer are making use of SouthPAN's early open services by selecting commercial offerings and specialised farming equipment with integrated SBAS-enabled receivers, such as quadbikes and sprayers. This has enabled Page Bloomer to consistently monitor, map, and manage their research and trial sites. With SouthPAN providing measurements at a level of detail suitable for precision farming, Page Bloomer has confidence they can return accurately to points of interest, vital to the results of long-term studies.

> "The integration of SouthPAN into our workflow has significantly boosted efficiency, giving us the accuracy needed to reliably track and manage our research site"
>
> *Dan Bloomer, Page Bloomer*

For many growers, spraying and weeding a large area can be a repetitive and monotonous task, in which it is all too easy to miss a row or accidentally revisit a row. Missing a row can potentially leave an area vulnerable to outbreaks of pests or disease, incurring significant expenses in time, effort and money to resolve. Similarly, missing a row in weeding tasks can be an expensive issue; and double spraying can kill plants entirely. For many tasks on orchards and vineyards, a reliable method of tracking the areas that have been treated, and the ability to identify a problem plant in a particular row, would greatly help to alleviate these issues. With a SouthPAN-compatible device, these tasks can now be completed faster, and at an accuracy that growers can trust, and rely on for their day-to-day activities year-round.

The Impact

Through using SouthPAN, Page Bloomer has significantly boosted their efficiency, giving them the accuracy needed to reliably track and manage their research sites. Page Bloomer is now able to:

+ Expedite the process of identifying specific points at their trial and research sites. In an orchard environment, SouthPAN ensures that their team are not only in the correct row, but in the correct tree. In field crops, the accuracy allows them to return to the same exact location every time, even after paddocks have been cultivated.

+ Map and record the location of buried infrastructure such as tile drains, irrigation hydrants and pipes to within one shovel-width, allowing Page Bloomer to efficiently maintain their sites, even in challenging conditions.

+ Reduce costs by using commercially available GNSS receivers with SouthPAN's free open-access corrections, without any reliance on mobile networks.

+ Utilise the capabilities of the vast array of free and commercial smartphone applications, which would not be operationally useable without SouthPAN's high accuracy positioning capabilities. Page Bloomer is now able to use applications including ArcGIS, Google Earth and Maps, GPS Logger, Field Bee and other custom-made apps in their day-to-day operations.

+ Equip their team with the tools and training needed to work efficiently across large areas, consistently locating small objects such as marker flags or insect traps and providing continuity to their long-term testing activities.

+ Save their teams hours when locating missing, displaced, or buried markers, avoiding costs associated with repeating expensive contract work. SouthPAN allows Page Bloomer's teams to sleep easier, knowing they can always get back to the right place.

+ Recommend SouthPAN to orchardists and winegrowers seeking a cost-effective and reliable way to track and manage orchard and vineyard crops with confidence. Using SouthPAN can prevent missed or repeated rows during spraying, which helps to mitigate crop damage and loss due to disease outbreaks.

Page Bloomer is using SouthPAN early open services in their everyday operations, significantly improving their ability to address operational and logistical challenges and supporting them in achieving their goal of innovating and advancing the efficient agricultural practices that underpin sustainable food and fibre production.

> "SouthPAN gives sub-metre accuracy, unlocking the potential of numerous applications for smart farming"
>
> *Dan Bloomer, Page Bloomer*

A SouthPAN enabled "rut-meter" towed by a quad bike allows Page Bloomer to accurately map rates of rut development

SouthPAN helps keep track in vineyards and orchards, shown here mapping the location of puddles and other hazards

Page Bloomer is a land management consultancy and community leader, seeking to create economically and environmentally sensible solutions for New Zealand's agriculture sector. Their expert team uses science and technology to innovate and advance efficient practices that support sustainable food and fibre production. Based in Hastings, New Zealand, Page Bloomer leverages its expertise and research in sustainable land and water management to promote processes that address economic, social, and environmental needs. With a rich history spanning two decades, they have seamlessly integrated farming methods to bolster food and fibre production, continually embracing innovative technologies to refine their techniques.

SouthPAN is a joint initiative of the New Zealand and Australian Governments that delivers SBAS services to these regions. Toitū Te Whenua Land Information New Zealand, in collaboration with Geoscience Australia, are leading the development, deployment, and operation of SouthPAN, the first SBAS in the Southern Hemisphere.

A SouthPAN enabled quad bike allows efficient and accurate mapping across a large area of otherwise inaccessible terrain.

For more information visit: https://www.linz.govt.nz/ southpan
Email the team: southpan@linz.govt.nz
Scan the QR code and subscribe to be kept up-to-date: