LATEST GENERATION DRONES IMPROVE AERIAL SURVEYS

Flying further, for longer and able to reach the most inaccessible areas, SGS’s new generation of drones make precision farming easier and more effective than ever.

Drones represent the future for imaging and data collection in precision farming. Larger machines, with longer lasting batteries make aerial surveys a reality for small farmers, farming co-operatives and commercial farms.

New technologies make it possible to deliver high-resolution images and rapid reporting, as well as targeted sampling and testing within days. With drone camera resolution reaching 3cm, compared to 5-15 meters for affordable satellite imagery, the images are clearer, sharper and a much more effective tool for agronomists.

DELIVERABLE ON A NEW SCALE
Covering farms from 2 to 2,000 hectares on a single charge, a much greater range than previously, our new drone is equipped with two cameras, which can deliver:

- Low-resolution orthophoto mosaic (stitched) images in Pix4D
- High-resolution orthophoto mosaic images
- NDVI map
- Contours/digital terrain models (DTM)
- High-resolution 3D model
- Fly-through/animation of the survey

FAST AND EFFECTIVE
On landing, images are downloaded and stitching can be completed overnight, allowing agronomists to start their analysis and report promptly. Survey recommendations, sampling, testing and analysis can be targeted to the most relevant areas and completed within days. These interventions are possible much more quickly than when working with satellite imagery, which takes longer to receive and is lower resolution.

EXAMPLE: CITRUS TREES – GROWTH PROBLEMS
SGS’s new drone, with its high-resolution photography, delivers clear images that under analysis by our agronomists help to build an inventory not only of the fields, but also of individual trees. In a survey conducted on citrus trees suffering growth problems, optical imagery offers a clear overview of the area (image 1), NDVI provides a graphical interpretation of growth rates (image 2) and the high-resolution of our images allows agronomists and farmers to zoom in and look at individual trees (image 3).

PRECISION MAPPING
Tapping into other technologies, the new generation of drone technology works with Google Earth. All images include precise GPS mapping and farmers can click on any ‘spot’ on them to reveal detailed photography and survey data.
Drone imagery can be used to:

- Identify and highlight:
  - Nutrient issues
  - Water application – evaluation of irrigation systems, even identifying overlap between irrigation systems (an issue that can be as bad for crops as no water)
- Create zone maps
- Give a clear visual picture of conditions in the field

ACCESS ALL AREAS

Roads do not limit drones. They can be deployed to conduct surveys in the most hard to reach farm locations – whether that access is limited by poor infrastructure, or geographic remoteness.

Operating in real-time, delivering very high-resolution images on demand and with low operating costs, the new generation of drones improves farming productivity, yield and sustainability.

With a range of up 2 to 2,000 ha this technology can be equally applied to small and commercial farms. It helps smaller enterprises to cut costs and improve productivity, if farms work together results from a single survey can be delivered on a farm-by-farm basis.

WEATHERING THE CONDITIONS

As well as extended range, battery power and functionality, the new drones is able to fly in most weather conditions – even in wind speeds of up to 18 km per hour. This is a significant improvement on previous drones, and still more flexible than satellite options.

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EXAMPLE: PLANT HEALTH ON WHEAT

NDVI data is used to review a number of performance indicators for plant health and growth. In a plant health survey conducted on wheat crops, our agronomists used NDVI imagery and data to create a detailed picture of plant health. A nutrient map (Image 4) identifies zones requiring treatment, an irrigation map (Image 5) demonstrates the effectiveness of irrigation systems and whether or not water is being applied evenly, it even identifies overlapping between pivots (Image 6) – where over-watering can be as damaging to crops as lack of water.

NDVI imagery captured by SGS’s drone during one single flight
GM CROP FIELD STUDIES GET THE GO-AHEAD IN ARGENTINA

SGS has received certification from Argentina’s National Seed Institute (INASE), to conduct genetically modified (GM) crop field studies to support the development of new traits and events.

Following a thorough review by INASE of our field trial capabilities, bio-safety arrangements and agronomy skills, we have been granted certification to perform field studies on the full range of GM crops. Following the accreditation of our field operation station in Junin, Argentina, customers are now able to apply for field trial permits from CONABIA (National Commission of Biotechnology).

Renan Gravena, Regional Business Development Manager, noted: “SGS is pleased to build on its GM trial capabilities in the region through our new field site in Junin, which will operate concurrently with our existing locations in Brazil. We look forward to further supporting the development of new traits and events in GM-crops in South America.”

SGS operates all field trials according to Argentina’s national standards, as set down by CONABIA, and the industry’s Excellence Through Stewardship initiative.

SGS provides services related to GM-crop field trials in many countries in North and South America, as well as Asia. Our extensive experience in bio-safety and agronomics, as well as the nutritional equivalence studies required for GM crops in their development phase, have been successfully replicated internally, allowing us to establish a robust, high-quality operation in Argentina.

With the approval process for GM field trial permits taking up to four months, we advise that all permits should be applied for ahead of time. To coincide with the main cropping period at our site in Junin, all trial permits should be placed with CONABIA between January and May. Following the approval of the trial permit by CONABIA, SGS is ready to commence trials, at the designated farm, using the GM material detailed in the permit application.

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SGS INCREASES CAPACITY AND EXPERTISE AT GLP MULTILAB IN FRANCE

Investment in new personnel, capabilities and buildings at SGS’s GLP Multilab in Saint-Etienne-du-Rouvray delivers a broader range of agriculture analyses.

Building on more than 20 years experience and expertise at this facility, SGS has invested to create extra capacity and ensure that our clients are able to meet all their regulatory responsibilities efficiently and effectively on a single site.

During 2015, we have invested in new personnel, new buildings – a sample reception area, homogenisation lab, and freezer storage capacity – as well as new, dedicated LC-MS/MS equipment at Saint-Etienne-du-Rouvray. At the same time, internal procedures have been optimised to deliver faster, more targeted support for our clients.

GLP accredited since 1993 and having successfully completed its 2015 audit, experts at this facility can conduct a range of studies, including:

- **Residue analysis**
  (method development and validation studies, storage stability studies and analytical phases in crop and in environmental matrices)

- **Ecotoxicology**
  (effect of chemicals on environmental organisms studies, bioaccumulation and biodegradation studies)

- **Physical chemical testing**
  (environmental behaviour studies, physical and chemical properties studies and on adjuvants, active ingredients or products including and five batches studies and impurity profiling)

SGS Multilab can deliver a broad range of analytical techniques, such as GC-MS, HS-GC-MS, GC-MS/MS, LC-MS/MS, CI, UV, IR, ICP-AES, and ICP-MS, among others.

Developing the GLP department of our Multilab, strengthens our analytical network and enables us to offer clients more analyses with standardised international approach. It builds on the success of the well-established SGS Institut Fresenius operation in Germany, and enables SGS to further leverage the skills and expertise across its laboratory network to ensure that we always deliver the most appropriate solution, wherever our clients are based.

With upgraded facilities and enhanced staff expertise, SGS Multilab at Saint-Etienne-du-Rouvray is now able to offer its clients extra capacity and the full-range of global agricultural analysis packages.

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INNOVATIVE IN-VITRO EFFICACY TESTING FOR FUNGICIDES

In-vitro efficacy testing for fungicides makes multiple testing faster, confirms the results of in-vivo testing and can reproduce a range of environmental factors.

Fungicide efficacy testing, against a range of phytopathogens, is hugely important to the agriculture sector as it tries to mitigate the variable nature of the diseases attacking seeds and crops in the field.

Over the years, application of fungicides has eroded their effectiveness, as diseases adapt and become increasingly resistant to traditional treatments. This means that today, testing is conducted against specific disease strains, and country conditions. Different strains may react differently to the same product – efficacy testing reveals these differences.

In-vitro methods for fungicide efficacy testing are a group of analytical methods which reproduce a range of environmental factors under artificial, laboratory, conditions. Bringing these tests indoors has a range of research benefits, including:

- Reduction of the factors that influence the results of treatments at the experimental stage
- Shortest period to obtain primary data – in-vitro testing takes 3–5 days for the full growth of fungus test objects, and 1–2 days for bacteria
- Reduction in analysis costs
- Potential to test multiple fungicides and targets simultaneously
- Confirmation of results obtained under in-vivo conditions

NEW METHODOLOGY

In Ukraine, SGS’s microbiological laboratory has developed a fungicide efficacy testing methodology that allows contemporaneous evaluation of a wide range of treatments against phytopathogens.

The approach we have developed evaluates the efficacy of plant protection treatments against the major groups of phytopathogens, and is based on the classical methods of microbiology and molecular genetics. In addition, the method of cryopreservation applied to microorganisms in our laboratory, allows testing to be conducted throughout the year.

In-vitro testing facilitates the study and evaluation of:

- Fungicide efficacy against phytopathogens, including territory specific variations
- Field trial results, in comparison to in-vitro testing
- The efficacy of treatments with biopesticides at different stages (after processing, under conditions of vegetation)

To ensure the most accurate and effective results, we use molecular genetic methods (based on PCR analysis) to detect and identify phytopathogen pathotypes. We can also conduct microbiological assessment of the risks, in the field.

This method allows large amounts of preliminary research work to be completed in a short period of time. With in-vitro we can test efficacy against numerous diseases, harmful to different crops. As a result, we can then develop the most appropriate field trial schemes. This approach will reduce costs for plant protection product development, significantly so for the most extensive field trials.

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ARE YOU MEETING BUYERS’ QUALITY, SAFETY AND SUSTAINABILITY REQUIREMENTS?

To satisfy consumer demand, farmers and agrochemical companies need assessments, audits and certifications to demonstrate compliance and build customer confidence.

Are you sure that what you are doing meets the requirements of your buyers and the agriculture and food supply chains?

In response to market demand from regulators and consumers, buyers increasingly require you and your operations to meet social, ethical and environmental standards as well as those for quality and safety. No longer is it enough to grow and market produce. To stay competitive and maintain customer confidence, it is necessary to improve soil protection, better manage water use, improve biodiversity, reduce chemical and pesticide use, and consider the welfare of workers and food safety requirements.

ASSESSMENTS, AUDITS AND CERTIFICATION

Audits can be conducted against a range of schemes and certification criteria established by organisations including:

- British Retail Consortium (BRC)
- GLOBALG.A.P.
- International Featured Standards (IFS)
- ISO 22000 and ISO 22005
- Single food audit pack (our own audit procedure that can help you, in a single audit, to meet most internationally recognised food safety and quality assurance standards)
- Integrated Farm Assurance
- O+S
- SOF
- UTZ
- Leaf
- European Water Stewardship (EWS)
- ISCC Plus
- GRASP
- SAI Platform Farm Assessment
- Bonsucro
- Animal Welfare Assessment
- SAFA
- Others and many private and customized protocols

INDEPENDENT EXPERTISE

Getting a trusted third-party to assess the farms within your business and supply chain is one way to gain and maintain more control, at the same time as allowing you to assess the risk. Independent experts can help to prove compliance with industry standards, as well as demonstrate a commitment to sustainable agriculture practices.

Assessments often lead to better farming practices and more highly-skilled workers. They highlight skills gaps, enabling you to access the right training and get advice on how to improve, and these are just the first steps.

Farm audits will benchmark facilities, processes, practices and quality against food industry standards and regulations. Auditing enables the performance of your business processes and produce to be measured and makes it easier to implement improvements. It also opens the door to new markets, financial improvements and reductions in both costs and waste.

Certification against industry schemes shows successful implementation of good practices, and that progress is consistent and continuous.

SGS SOLUTIONS

Our agriculture industry assessments, certification and auditing services can help you to prove ongoing compliance and improvement, enhance operational efficiency, manage risk and increase marketability.

Rely on our expertise and expect a customised – and standardised – service wherever you operate.

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NEW FIELD STATION IN HUNGARY

In Cegléd, Hungary, we have opened a new field station, continuing our investment in the region. Strategically located, Cegléd is just 70km south east of Budapest, this new facility includes offices, dedicated rooms and arable fields.

Field trial services in Hungary cover several field types and can deliver:
- GEP efficacy trials
- GLP residue trials
- Demonstration trials

SGS’S GERMAN FIELD RESEARCH STATION NETWORK EXPANDS

In 2015, SGS has opened new field research stations in Bahlingen am Kaiserstuhl and Emstek, in Germany and invested in local expertise to expand our team of experts.

At our new station in Bahlingen am Kaiserstuhl we can conduct trials on agricultural crops, and in vineyards or orchards. In Emstek we moved into new premises. Additionally, our Neuruppin site, near Berlin, has now been operational for two years.

All these field stations are able to perform efficacy, selectivity, residue and soil dissipation studies.

Furthermore, our station at Gråsten, Denmark has received GEP and GLP certification.

CLIENTS VISIT OUR NEW SEED QUARANTINE FACILITY IN BRAZIL

Opened in December, SGS’s new seed quarantine facility in Brazil has given clients a rare opportunity to visit such a centre.

Visitors have met our team of experts, toured the state-of-the-art laboratories and learnt about the risks posed to Brazil’s flora and fauna from the pests that can be unintentionally introduced via seed imports.

Working closely with the Brazilian authorities, our facility – the first private independent quarantine service in the country – provides independent and accurate phytosanitary analysis of seeds imported by breeding companies.

SGS SEED AND CROP EVENTS

Meet SGS representatives at the following events:

- **NAICC**
  Jan 27 - 30
  Orlando, FL, USA
  [http://naicc.org/meetings/2016-annual-meeting/](http://naicc.org/meetings/2016-annual-meeting/)

- **ASTA VEGETABLE & FLOWER SEED CONFERENCE**
  Jan 30 - Feb 2
  Anaheim, CA, USA

- **AKADEMIE FRESENIUS, FOOD SAFETY AND DIETARY RISK ASSESSMENT**
  Feb 29 - Mar 1
  Köln – Am Stadtwald, Germany

- **SETAC EUROPE**
  May 22 - 26
  Nantes, France
  [http://nantes.setac.eu/?contentid=851](http://nantes.setac.eu/?contentid=851)

WANT TO KNOW MORE?

To read our previous publications click here

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