



AGRICULTURAL SERVICES

**PLANT PROTECTION
REGISTRATION SERVICES**



FROM SOURCE TO SUPPLY- BUILD TRUST THROUGHOUT VALUE CHAINS

SGS IS THE WORLD'S LEADING INSPECTION, VERIFICATION, TESTING AND CERTIFICATION COMPANY AND IS RECOGNISED AS THE GLOBAL BENCHMARK FOR QUALITY AND INTEGRITY. WITH MORE THAN 64,000 EMPLOYEES, SGS OPERATES A NETWORK OF OVER 1,250 OFFICES AND LABORATORIES AROUND THE WORLD.



Sustainable and productive agriculture needs a continuously innovative approach for improved management of crop production. With the growing demand for efficiency and with environmental concerns at the forefront, the ability to provide expertise for germplasm development, research, product development, soil fertility management and other speciality analytical data are crucial for success.

SGS has developed a unique package of services to assist Life Science companies, plant breeders, seed producers, agrochemical companies and distributors, fertiliser suppliers and ultimately farmers to achieve registration, safe application and optimum usage of these products.

Our tailor-made services for are used throughout the value chain of the agriculture and food industry. With cutting edge technologies and expertise developed over the last 130 years, our team of specialists at SGS is fully equipped to meet your needs. To help you maximise your returns and to give your business a competitive edge, SGS has developed unique service packages.

CAPABILITIES

The following services detail some of our activities:

- Residue Studies (GLP)
- Efficacy Studies (GEP)
- Environmental Fate
- Eco-Tox Bee Studies
- Leaching / Run-Off
- Rotational Crop Studies
- Operator Exposure
- Genetically Modified Organism (GMO) Analysis
- Food Processing
- Seed and Grain Analysis
- Regulatory Affairs
- Glasshouse/Polytunnels
- Cultivation Studies
- Variety Evaluation
- Biopesticides
- Selectivity Studies
- Crop Sequencing Analysis
- Stored Crop Analysis
- Product Property Analysis

BENEFITS

- Standardised operating procedure
- Quality approach and state-of-the-art equipment prevent bias in the studies performed
- Access to a European/Global network offering a fully international service
- Rigorous training with continuous improvement
- Many in-house services under one management structure

WORKING GUIDELINES

- GLP Accreditation
- GEP Accreditation
- EPPO / CEB
- ISO 9000 Accredited
- WHO-FAO
- OECD

SGS VALUES

- Integrity – the cornerstone of our reputation
- Speed and efficiency – being prompt and accurate
- Independence and neutrality
- Innovation and ability to adapt to change
- Trust



GEP FIELD STUDIES

SGS Seed & Crop Services offer a flexible and impartial resource for your product development, supporting your needs throughout the research process.

Our experienced staff can conduct field trials to support the screening, development and registration of agricultural and horticultural chemicals, biopesticides, fertilisers and new plant varieties (including GMO or Genetically Modified Organism). The trials are conducted from our field stations located across Europe, North and South Americas and Asia offering a complete competitive service from one source. All our testing facilities comply with the relevant, industry specific Quality Management Systems for conducting regulatory efficacy studies for local, international and global submissions.

OUR SERVICES

- Crop Efficacy Testing for local, international and global submissions
- Selectivity Trials to determine the effects to crops
- Protocols drawn up to EPPO guidelines
- Megamix/Compatibility Analysis
- Drip / Drench Irrigation Studies
- Local and European Study Management
- Electronic Data Exchange in ARM or company defined versions
- Full Project Reports
- Secure Internal Data Management System (Intranet)

CATEGORIES

- Acaricides
- Biopesticides
- Fertilisers
- Fungicides
- Herbicides
- Insecticides
- Nematicides
- Molluscicides
- Plant Growth Regulators (PGRs)
- Stored Crops

Applications in all countries are aimed to comply with Good Agricultural Practice. SGS offers efficacy testing on any crop or uncropped situation in all regions we work in.

DEMONSTRATION FIELD TRIALS

SGS Seeds & Crop Services offer solutions for Life Science and Crop Science companies, plant breeders, seed producers, fertiliser producers, distributors, growers and consumers.

SGS offers services for development and demonstration for both product comparisons to demonstrate the capabilities of agrochemical compounds or the management of large scale demonstration centres, where a choice of crops and varieties can be planted and used in conjunction with a range of spray programmes, compounds and mixtures to provide a diverse situation, ideal for education, demonstration, development, sales and marketing purposes.

EQUIPMENT

Technology itself isn't the answer – it's the right technology that counts. At SGS, we have a wide range of specialised equipment to enable us to conduct all types of trials. We are constantly reviewing and renewing our systems and tools to bring better technology systems to the field, to laboratories and into our offices.

LAND

In many places across Europe SGS rents and manages their own land, allowing tailored solutions to complex layouts and introduction of targets into conditions for best demonstration. With land linked or close to our offices this also provides an ideal location for groups to meet, view and discuss the trials on show in a convenient atmosphere.

OUR SERVICES

- Market/Sales Support Trials
- Product Comparison Trials
- Sequence Comparison
- Timing Comparison
- Variety Demonstration
- Seed Rate Demonstration
- Field Demonstration Centres
- Variety Pest Interaction
- Irrigated, enhanced conditions







POLYTUNNEL /GLASSHOUSE

SGS has a great deal of experience in testing plant protection products for efficacy and selectivity within glasshouses/polytunnels on wide range of crops including vegetables and ornamentals.

New chemicals and formulations are screened in controlled conditions unrelated to seasons under natural or artificial infestation to provide early information on their biological activity prior to progressing with Field Studies.

Testing involves crop safety investigation and dose rate studies using small pots and cages.

In our extensive network, we have a high number of different ornamental and vegetable glasshouse producers which gives us the possibility to cover most aspects of crop protection and Plant Growth Regulator (PGR) in glasshouses.

OUR SERVICES

- Crop Safety Screening
- Efficacy Testing
- Dose rate definition
- Succeeding crop studies
- Molluscicide testing
- Screening of new formulations
- Seed germination and propagation tests
- Artificial pest infestation
- Protected soil/cage/pot/tray trials



SPECIALITY STUDIES

SGS provides a range of speciality services both in field and laboratory.

RESISTANCE ANALYSIS

- Testing against standard or requested products

FIELD SCREENS

- Small Plot, Unreplicated or Replicated
- Herbicide, Fungicide, Crop/Variety Type
- Rate and Formulation Comparisons
- Drilled Target Species

PRODUCT PROPERTIES

- Rainfastness (field and controlled environment)
- Pattern Testing
- Nozzle Effectiveness

NEMATODE STUDIES

- Glasshouse/Field Crops
- Irrigated, Spray, Granule Application

CROP SEQUENCING

- Single and multiple following crop effects

SPECIFIED USES

- Forestry
- Amenity Grass
- Fertiliser
- Horticultural
- Ornamental

CONTROLLED STUDIES

- Inoculated Studies
- Irrigated Studies

ECOTOXICOLOGY AND BIODEGRADABILITY

Ecotoxicological studies deal with potential influences on waterbodies through chemicals, crop protection agents, biocides, animal and human drugs and with target areas line their flora and fauna. The corresponding results of these studies are used in environmental risk assessments within the scope of the registration process for substances and products. These tests are conducted according to the principles of Good Laboratory Practice (GLP).

SGS is accredited according to DIN EN ISO/EC 17025 and is GLP certified for a wide range of corresponding test procedures. We have particular experience in the area of problem substances that are poorly soluble in water, highly volatile and/or coloured.

ECOTOXICOLOGY

Test methods according to OECD, DIN, ISO, EPPO, CEC, EPA, and ECETOC guidelines

- Bacteria toxicity tests (acute, chronic, aerobic, anaerobic, mono-species tests, tests on complex associations)
- Algae growth inhibition test (various species)
- Crustacean toxicity (e.g. daphnia)
- Fish toxicity, acute (static, semi-static)
- Worm toxicity, acute
- Plant growth inhibition tests
- Soil microflora test (BBA regulation VI 1-1)

BIODEGRADABILITY

Test methods according to OECD, DIN, ISO, EPPO, CEC, EPA, and ECETOC guidelines

- „Rapid“ biodegradability
- „Basic“ biodegradability
- Simulation tests (sewage treatment plant simulation)
- Biodegradability in an anaerobic environment
- Compostability/rotting ability
- Biodegradability of mineral oil products
- Primary degradability of surface-active substances

HONEYBEE STUDIES

In recent years, there has been an increased interest within the Regulatory Authorities in the protection of beneficial species with a specific focus on honeybees. SGS has set up specialised services in the higher tier testing for honeybees in the field situation. Operating in accordance with tests defined in the EPPO/CEB and OECD guidelines, SGS is also able to offer tailored tests for specific purposes and interests.

OUR SERVICES

- Standard tests, semi-field and field
- Brood tests, semi-field and field
- Residue studies, semi-field and field; inclusive residue analysis of all matrices
- Dust and guttation studies; inclusive abrasion test according to Heubach method
- Tailored tests for specific purposes and questions (i.e long-term or feeding tests)

CROPS

- Rape (semi-field and field)
- *Phacelia* (semi-field and field)
- Mustard (semi-field and field)
- Wheat (honeydew simulation, CEB)
- Special crops, such as maize, apple etc.

RELEVANT CROP

The standard crop for semi-field and field studies required so far is *Phacelia* or rape. Due to the CEB guidelines enforced in France, studies on wheat are also required to some extent (i.e. the simulation of honeydew).

EFFECT ASSESSMENT

For the evaluation of side effects on the honey bee (*Apis mellifera* L.) after application of plant protection products on relevant crops, the study design has to be adapted to the special needs of the plant used such as citrus, sunflower and apple. To assess the effect on the colony health, we offer long-term bee studies which can include one over-wintering, but could also last up to three years.

BROOD TEST

Besides the parameters assessed in standard studies (mortality, flight activity and behaviour in the crop and bee brood development), additional assessments are included in brood studies. Special attention is drawn to the evaluation of the condition of colonies and bee brood development.

RESIDUE ANALYSIS

By restricting the forager bees to the treated area only, a worst case scenario for the contamination of the bees can be given. Possible residue samples are honey/nectar, pollen, wax and royal-jelly from inside the hives, pollen and nectar from bees, flowers and plant. Bee studies are sometimes required to assess the safety of the plant protection product.





GLP FIELD STUDIES

By entrusting SGS with their trials, the whole Crop Protection Industry can benefit from the expertise of our Group internationally. Our standardised operating procedures, field trial document system, experienced staff, quality approach and state-of-the-art equipment prevent bias in the studies performed. Our customers can also benefit from one single contract offering a fully international service.

We have many years of experience in the planning and coordination of Good Laboratory Practice (GLP) residue programmes throughout Europe providing a complete, competitive service from one source. A pan European network of experienced employees and contractual partners conduct GLP trials under all geographical and climatic conditions. Our laboratories provide residue analysis including method development and validation, environmental fate in the laboratory, degradability and ecotoxicology.

OUR SERVICES

- Project Management/Study Directorship
- Crop Residue Trials
- Crop Rotation
- Soil Accumulation
- Soil Dissipation
- Operator Exposure
- Environmental Fate
- Ecotoxicology
- Field Leaching
- Run-Off
- Kinetic modelling
- MRL Estimation
- Central QA Team
- Harmonised SOP's
- Drip / Drench Irrigation Studies
- Polyunnel / Glasshouse Studies
- Seed Dressing & drilling

SGS can offer trials in the field, polyunnel or in glasshouses under controlled conditions with all trials carried out by our experienced staff. Study Management is run through our laboratories, with all field stations GLP compliant and audited regularly. Samples are monitored and transferred on a regular basis in suitable conditions with a carrier which to our analytical laboratories or a facility of your choice.

DISSIPATION & ACCUMULATION STUDIES

Dissipation behaviour in the soil plays an important role for the environmental behaviour of substances such as crop protection agents and fertilisers. Substances that degrade slowly can enrich with repeated application and can represent an increased danger for soil life and other environmental compartments such as ground water.

Degradation behaviour and studies to calculate the concentration in the soil form a basis for an extended risk assessment within the scope of a registration process.

For more than 15 years SGS has been conducting studies into degradation behaviour in the soil and concentration behaviour after many years of application throughout Europe with experienced study managers, specially trained samplers and measuring technicians. SGS has experience in the widespread use of crop protection agents and also in special application techniques (e.g. granular applications, seed treatment, drip application) and unusual sampling requirements (e.g. soil depths up to 2m, application monitoring).

OUR SERVICES

- Advice in study planning
- Coordination with authorities and farmers
- Selecting study locations and sites
- Drafting study plans
- Determining all relevant site parameters
- Equipping the location with measuring technology and marking out the field sections
- Selecting and deploying validated sampling technology
- Sample transport, storage, homogenisation
- Residue analysis in the soil and plant growth
- Standardisation of data/modelling
- Determining the dissipation kinetics
- Estimating the environmental concentration in the soil
- Drafting the final report

ENVIRONMENTAL STUDIES

ENVIRONMENTAL BEHAVIOUR IN LABORATORY TESTS

Knowledge about the biotic and abiotic conversion of substances is an important prerequisite for assessing the risks of chemicals in the environment. In addition to the conversion of substances, their translocation and the associated discharge into neighbouring environmental compartments also play an important role in a complementary environmental risk assessment. Tests which help describe the behaviour of substances in the environment are required for pesticides, biocides, chemicals and increasingly also for drugs under standardised, internationally recognised test conditions and in compliance with the principles of Good Laboratory Practice (GLP).

CONSULTING/EVALUATION

- Checking existing data as a basis for environmental risk assessments
- Developing a test strategy

BIOTIC DEGRADATION/METABOLISM

- Degradation in soils and water/sediment systems under aerobic and anaerobic conditions
- Determining the degradation kinetics in the soil and water/sediment systems

ABIOTIC DEGRADATION

- Hydrolysis in relation to pH

DISPLACEMENT

- Leaching into the soil
- Adsorption/desorption on soils and sediments

EXPOSURE ESTIMATES

- Calculation of the predicted environmental concentration (PEC) in soils, water and sediment, and air
- Determination of the degradation kinetics

OUR SERVICES

- Advice in study conception
- Project management/study management
- Analytics in all environmental matrices
- Modelling/PEC value calculation
- Expert opinions/reports

ENVIRONMENTAL FIELD STUDIES

Our services with regard to testing of the environmental behaviour of crop protection agents and other substances include various methods and study types. As these studies are conducted in connection with registration procedures they are carried out according to the principles of Good Laboratory Practice (GLP). The methods used in the field correspond to valid technical-scientific standards and guidelines.

The aim of field studies is to measure transport and propagation behaviour in the environmental compartments in order to evaluate the environmental risk especially for soil, air and ground and surface water.

STUDY TYPES

- European Union-wide monitoring studies
- Field leaching studies
- Field dissipation/accumulation studies
- Drainage studies
- Surface water studies
- Ground water studies
- Run-off studies
- Air monitoring/drift value determination

OUR SERVICES

- Advice in test planning
- Coordination with authorities and farmers
- Selecting test locations and appropriate surfaces
- Study design and study plan
- Determining relevant location parameters
- Equipping the location with measuring technology
- Selecting and deploying validated sampling technology
- Sample transport, storage, homogenisation
- Residue analysis in the water and soil

- Drafting the final report
- Standardising the data
- Determining the leaching behaviour
- Predicting the environmental concentration in ground and surface water





FOOD PROCESSING STUDIES

Because of its many years of experience in the fields of food technology, content and residue analysis of raw materials, intermediates and end products, SGS INSTITUT FRESENIUS is able to offer a complete and unique service in almost all areas of the food industry. A large number of conventional techniques such as bottling and canning, milling, fermentation, refining, brewing and sterilisation can be used under industrial production conditions as required.

SGS INSTITUT FRESENIUS MONITORS THE PROCESSING AND TAKES OVER THE FOLLOWING TASKS

- Nominating the study director
- Drafting the study protocol
- Compiling process-related documentation
- GLP quality assurance via SGS
- Coordination and monitoring of the processes by the study director
- Sample shipping under controlled conditions
- Analysis of processed fractions

CONDUCTING AND MONITORING PROCESSING STUDIES.

Our experiences with industrial processing cover a broad spectrum – the following are only a small sample of specific individual projects:

APPLES	JUICE, PUREE, DRIED FRUIT
COTTON	PRESS CAKE/MEAL, CRUDE OIL, REFINED OIL
CITRUS	JUICE, CONCENTRATE
STRAWBERRIES	JAM, PRESERVES
GHERKINS	PRESERVES
BARLEY	MALT, PEARL BARLEY, BEER
OATS	FLAKES
HOPS	BEER
CARROTS	BLANCHED CARROTS, JUICE, PRESERVES
POTATOES	INSTANT POTATOES, COOKED POTATOES, POTATO CHIPS
CABBAGE	SALAD, COOKED CABBAGE, SAUERKRAUT
MALT	BEER, WHISKY
OLIVES	OIL, FERMENTATION
PLUMS	JAM, PRUNES
RICE	HUSKED RICE, HUSKS
SUNFLOWERS	PRESS CAKE/MEAL, CRUDE OIL, REFINED OIL
RAPE	PRESS CAKE/MEAL, CRUDE OIL, REFINED OIL
SOY BEANS	PRESS CAKE/FLOUR, CRUDE OIL, REFINED OIL, MILK
GRAPES	WINE, RAISINS, JUICE
WHEAT/RYE	FLOUR, BREAD
SUGAR BEET	SUGAR, MOLASSES

OUR SERVICES

All food processing processes are carried out according to the OECD guidelines and in compliance with GLP. In addition to processing and analysing food, animal feed (e.g. silage) and taint test can also be performed (without GLP). SGS carries out the processing studies as balance or follow-up studies and, on the basis of the results of the processing and residue analysis, calculates the transfer factors for the residues.

SEED STUDIES

In the highly specialised field in which we work there is no substitute for expertise. We have actively sought out professionals who are specialists in their field and we combined this with a deep understanding of our clients' needs.

We combine rigorous training with continuous improvement. We draw on the best thinking available to ensure we are always justified in our claim of being real experts.

We believe that local clients need local solutions. Our experts are flexible enough to react to individual needs but have access to the broadest global tools and networks. Knowledgeable staff with access to a wide range of growers and consultants allows trials to be carried out on virtually any crop.

OUR SERVICES

- Variety Studies
- Screening of Varieties
- Testing of Densities
- Tolerance to Diseases
- Evaluation of Traits
- Crop Sensitivity
- Seed Treatment (GLP/GEP studies)
- Physical and Mechanical Seed Analysis
- Seed Loading Analysis
- Heubach Dust Analysis
- Storage Stability

Wide range of field crops are tested such as wheat, durum wheat, barley, triticale, oats, rye, maize grain and fodder, oilseed rape, sunflower, soybean, beans, peas, potatoes, grass, field vegetables, and flowers.

We investigate the efficacy of new seed treatments for the control of different pests and diseases.

A FLEET OF QUALITY TESTING EQUIPMENT

- Plot Drills
- Conventional Box Drills
- Plot Harvesters
- Precision Drills
- Vegetable Planters
- Potato Planter
- Grass Drill
- Range of Cultivation Equipment

SEED ANALYSIS

INDEPENDENT SEED AND GRAIN ANALYSIS

ADVISORY SEED ANALYSIS

- Purity
- Other species content
- Screenings
- Seed Identification
- Moisture
- Thousand Seed Weight
- Germination
- Rapid Tetrazolium Viability
- Vigour Testing
- Stem Nematode

DISEASE ANALYSIS

- Fusarium
- Bunt
- Loose Smut
- Leaf Stripe
- Ascochyta
- Pea Bacterial Blight

GRAIN QUALITY ANALYSIS

- Protein
- Hagberg
- Gluten
- Admixture
- Moisture
- Natural Weight
- Oil Content
- Nitrogen
- Infestation
- Stem Nematode
- Mycotoxin Analysis

PROFESSIONAL ADVICE

SGS can offer advice on seed quality which will complement its wide range of analysis. This experience also extends to grain, incorporating expertise in grain quality, analysis and other associated topics.





REGISTRATION SERVICES

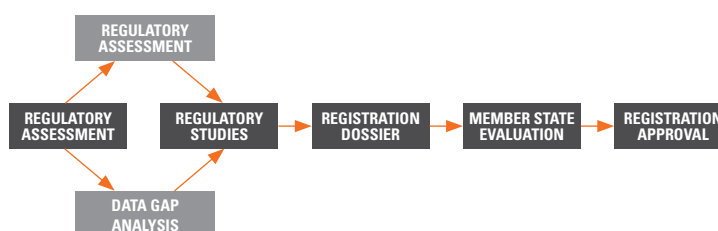
SGS provides expert support in the analysis, management, coordination, compilation and submission of data to member state authorities across the European Union (EU) for new and existing Plant Protection Product Registration.

OUR SERVICES

- European Approach
- Data Gap Analysis
- Evaluation of Uses
- Specific National Registration Requirements
- Annex II (active substance related)
- Annex III (product related)
- AI Risk Assessment
- Study Planning
- Management of full packages, including in-house support
- Preparation of BADs
- Preparation and presentation of registration dossiers
- CADDY compliant submission
- Product Label and MSDS preparation

A MORE COMPLETE PACKAGE

- Physical Chemical Properties
- Validated Methods of Analysis
- Human Risk Assessment
- Residues in Food
- Ecotoxicology Studies and Environmental Risk Assessment
- Efficacy
- Classification and Labelling



ANALYTICAL SERVICES

Pesticides are vital part of the Agriculture industry, assisting growers in meeting world's food demands. However, due to negative impacts on human and animal health as well as ecological effects of pesticides and contaminants, it is not desirable to find residues of those chemicals pesticides in food or feed after it is harvested and headed for human or animal consumption.

PESTICIDE RESIDUE AND CONTAMINANTS

PESTICIDE RESIDUE

SGS's Pesticide Residue Services include testing for insecticides, herbicides and fungicides in the following classes:

- Acetamides
- Carbamates
- Dicarboximides
- Imidazolinones
- Nicotinoids
- Organochlorines
- Organonitrogens
- Organophosphates
- Phenoxy acid herbicides
- Phenylurea herbicides
- Pyrethroids
- Triazines
- Triazoles

CONTAMINANTS

Melamine, mycotoxins, veterinary drug residues such as antibiotics, and hormones may be concentrated in products after processing. SGS offers many contaminant tests to suit your needs. Please contact us for more information regarding tests.

GLOBAL MARKETS

Our laboratory specialises in measuring pesticides in a variety of agricultural matrices.



CONTACTS

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WHEN YOU NEED TO BE SURE

SGS