KPMG

Monitoring with drones in **agribusiness**

2021

SKYLINE DRONES

Why the partnership with
Skyline Drones **?**

Skyline Drones is **#1 Drone Service Provider** in Romania

- Flight certified pilots
- Compliance with all necessary regulations and certifications
- Investment of over € 350 k
- Corresponding insurance for € 1.3 M
- Proven experience in precision agriculture
- Cutting edge technology
- Experience in working with the best known agricultural companies - KWS, Syngenta, ADAMA and Monsanto
- Collaboration with large farmers with more than 3,000 ha each

- Experience in research and development, technical and large plots
- All types of crops covered
- National coverage
- Multiple teams
- All sensor types (RGB, multispectral, thermal)
- All types of UAVs
- Precision Agriculture Committee member at UAV Commercial Expo Amsterdam
- Capturing up to 1,000 ha per day

>50 000 ha mapped

Projects in
Romania, Kosovo, Bulgaria, Hungary

Overview

Useful information for growers:

- ✓ Identifying parasites, diseases, weeds
- ✓ Providing fertility information
- ✓ Detecting nutrient deficiencies
- ✓ Creating a plan for farms or surroundings
- ✓ Irrigation and drainage analysis
- ✓ Detection of damaged crop areas
- ✓ Estimation of crop numbers
- ✓ Plant evolution development
- ✓ Optimising resources used
- ✓ Helps in the use of a variable application rate to increase hectare productivity
- ✓ Reducing possible losses

Drone surveillance services can be used from early March to October or November and when the average temperature is at least 5-6 °C.

SPRING

Activities

- Equipment preparation
- Soil treatment application
- Plot and soil preparation
- Crop planting

Drone

- Early soil analysis and drainage capacity assessment
- Establishing the digital elevation profile of the field
- Estimation of necessary nitrogen levels

SUMMER

Activities

- Application of crop treatments like: herbicides, insecticides, antifungals, fertilisers etc.
- Irrigation monitoring

Drone

- Estimation of crop number
- Creation of a gap analysis
- Monitoring the evolution, growth and unfolding of the crops
- Estimation of nitrogen levels
- Monitoring/observation of crops

AUTUMN

Activities

- Harvesting and preparation of the soil for winter

Drone

- Before Harvest - soil analysis, drainage assessment and determination of the topography of the field
- After Harvest - soil observation (consistency, dryness level etc.)

Type of service
overview

Standard Count

Determines the number of plants in a custom area and compares it with the expected results. Used to estimate the quality of sowing or potential yield loss.

Plant stress analysis

Provides information about how healthy your crops are and helps you react proactively to potential problems.

Pest analysis

Detects areas infected with pests and allows you to fully optimise pesticide use.

Plant population

Provides information about the number of plants. Can be used with any kind of rows, including different orientation angle rows.

Weed analysis

Identifies weed infestations and allows you to take effective in-season corrective measures and to optimise pesticide usage.

Plant disease analysis

Analyses crops at all stages of growth to obtain valuable information about the current state of plants.

Water stress analysis

Identifies areas with potential water stress and standing water. This type of data allows you to intervene in due time and install drainage systems or waterways to prevent crop loss.

Eagle Eye Report

Allows you to create a complete list of field annotations which highlight specific points on your field, along with their size, length and precise GPS coordinates.

Estimation of flowering

Assesses flowering levels to determine the exact plant growth stage. This data allows you to adjust pesticide usage, choose the right harvest date and take other important crop management decisions.
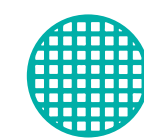
Variable application rate (VAR)

VAR maps allow for variable application of treatment based on the machine's GPS position, stimulating farm output.

Factors Influencing The Adoption Procedure

1 Enhance Productivity

Handling tasks through drones is more convenient and economic than through human intervention.

2 Reduce Time

Drones often carry out tasks more quickly.

3 Better Planning

Drones make planning easier as aerial views give a better picture to visualise the area of interest.

4 Maximum Accessibility

Drone reach is better in terms of length, breadth and height, and they can easily go to many inaccessible areas.

5 Lower Cost of Operation

Using drones in a strategic way can bring down the cost of operations, such as product delivery cost, cost of surveying, etc.

6 Wide Product Range

Drones are available in different forms, sizes and a wide price range according to need and use.
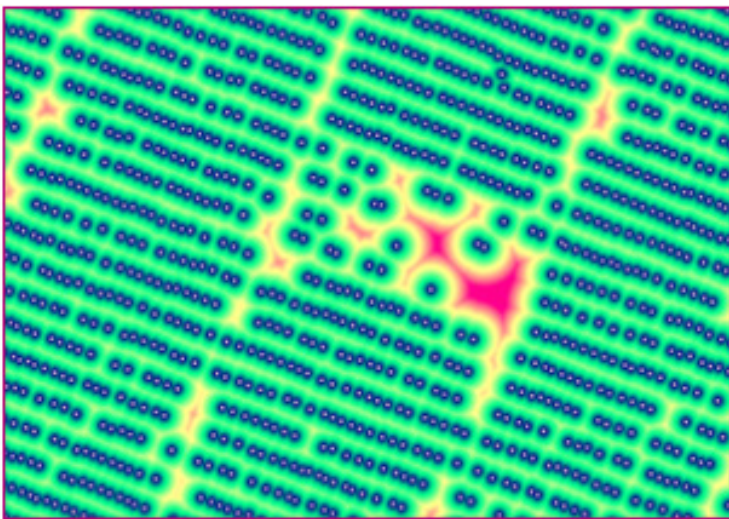
7 Mitigate Risk

A drone accomplished task is less risky compared to one carried out by a human, especially for activities carried out at high altitudes.
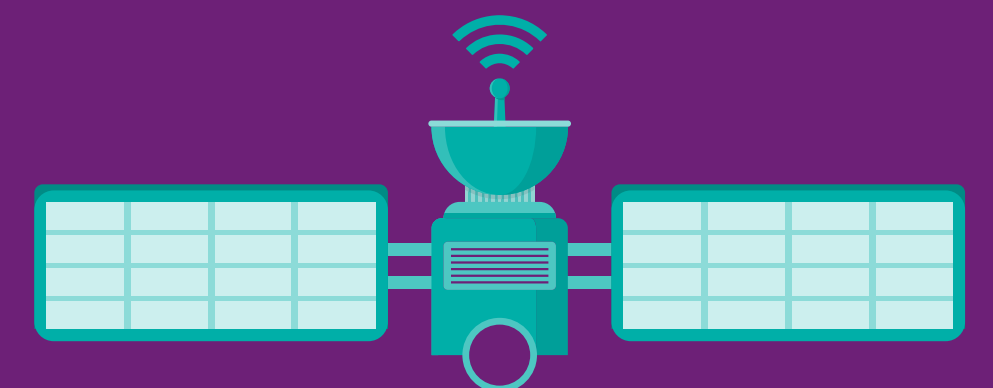
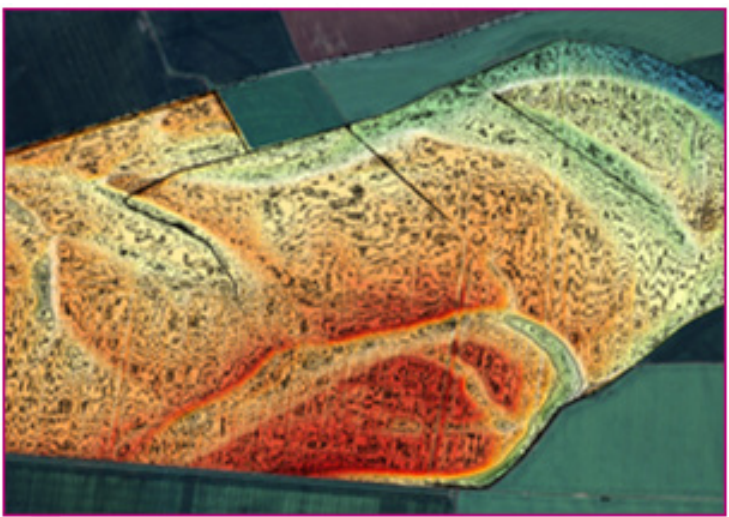# Examples of analysis

Stand Count

What for?

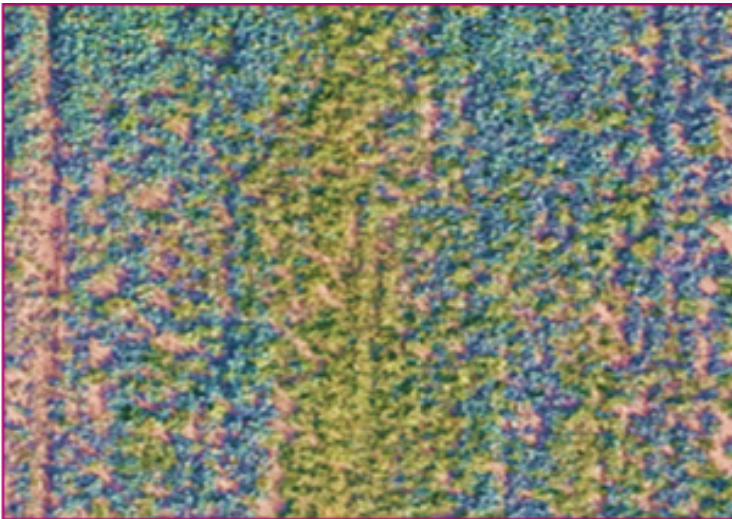Count plants per hectare and compare with estimated values.

Why?

Measure sowing quality, estimate losses, consider opportunities for resowing, assess damage or plan your harvesting potential.

Weed analysis

What for?

Assess which areas have weed infestation and their percentage of the total.

Why?

Improve herbicide usage, increase the efficiency of chemical treatment. Apply locally, avoid losses. (Scouting will be needed to identify the exact type of weed).

Elevation profile

What for?

Elevation profile with detail of up to 10 cm.

Why?

Preparation of land before sowing, avoiding waterlogging or creating a drainage system operating in the correct direction.
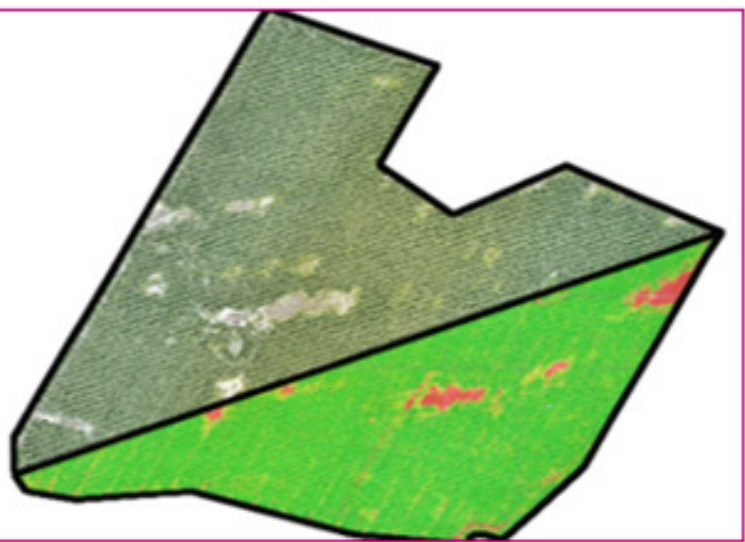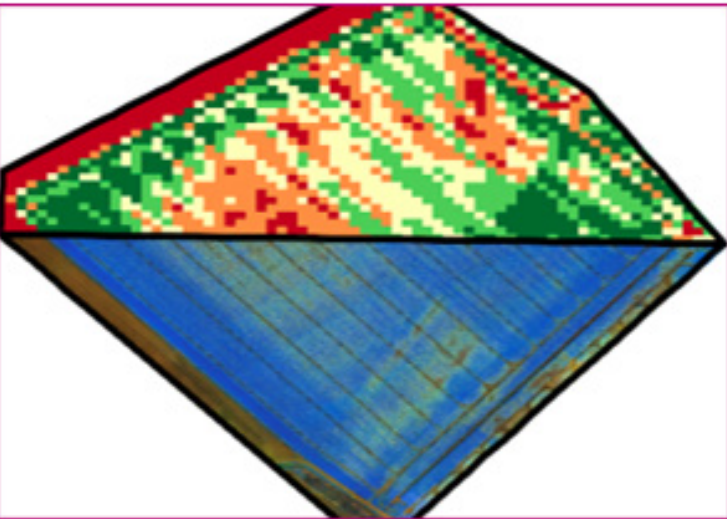
Pest analysis

What for?

Assess which areas have pest infestation and their percentage of the total.

Why?

Improve pesticide usage, increase the efficiency of chemical treatment. Apply locally. Avoid losses. (Scouting will be needed to identify the exact type of pest).

Variable Application Rate (VAR)

What for?

Creates management areas of a field in which different nutrients should be applied.

Why?

Needed for prescription maps based on the capacity of plants to absorb more or less nutrients. Helps optimise crop production.

Disease analysis

What for?

Assess which areas have disease infestation and their percentage of the total.

Why?

Improve the use of fungicides, increase the effectiveness of chemical treatment. Apply locally. Avoid losses. (Scouting will be needed to identify the exact type of disease).

Proposals for analysis by season

Winter crops (wheat, WOSR etc.)

Flight period	Type of analysis	Applicability
Late Oct, Nov	Elevation Points	Field height. Areas that are likely to become waterlogged, suffer water loss or require drainage.
Late Autumn or Spring	Stand Counting	Number of plants that have emerged after sowing. Helps to decide if, overall, the crop can be kept or if it should be replaced with other crops (e.g. corn, sunflower).
Late Autumn or Spring	Weed Analysis	Percentage and areas of weed infestation.
Late Autumn or Spring	Stress Analysis (pests or diseases)	Plant health: pest or disease analysis.
Spring	VAR application	The Variable Application Rate is an automated application of pesticides to a given area, based on data collected by sensors, maps and GPS. The VAR generated by drones may be used to increase or reduce the application rate of pesticides, using a GPS and prescription maps.

Spring crops (maize, sunflower etc.)

Flight period	Type of analysis	Applicability
Feb, March	Elevation Points	Field height. Areas that are likely to become waterlogged, suffer water loss or require drainage.
June	Stand Counting	Number of plants that have emerged after sowing. Helps to decide whether areas should be sowed without plants (in the case of "poor emerging").
June	Weed analysis	Percentage and areas of weed infestation.
July	Stress analysis (pests or diseases)	Plant health: pest or disease analysis.

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