

# Climate Smart Agriculture Booster Technology Showcases

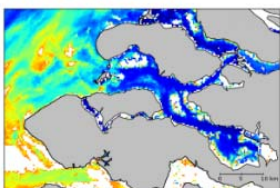




## Climate Challenge

The global demand for food with high quality protein is rising. Aquaculture is gaining importance to ensure food security. Climate change, through its influence on water temperature and water depths, will determine in which coastal zones aquaculture can take place in the future.

### Site Selection

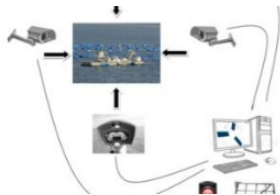


## Our solution

Smartshell is a real-time and online tool providing information on water quality of coastal areas for the aquaculture sector. Smartshell enables:

- Selecting suitable sites for aquaculture in coastal zones
- Real-time monitoring of water conditions
- Monitoring and forecast of (shell)fish production

### Real time monitoring

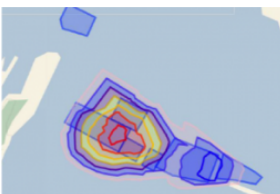


## Your benefit

- Improved production from aquaculture farms
- Early warning for climate-induced management risks

- Guided site selection for aquaculture farms

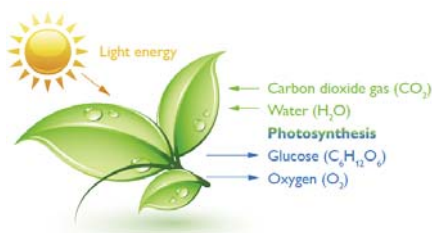
### Production monitoring



# LED-based cultivation systems



PHILIPS



## Climate Challenge

Greenhouse horticulture consumes large amounts of fossil energy, leading to  $\text{CO}_2$  emissions. Increased consumer demand has increased the use of assimilation lighting in horticulture. The high heat load of conventional light sources results in too high greenhouse air temperatures, leading to a deliberate loss of heat by ventilation.



## Our solution

LED lighting has a much lower heat load than conventional light sources, which allows for a better light distribution around the crop.



## Your benefit

- 30% more efficient than conventional light sources
- Less input of fossil energy
- Lower heat loss
- Increased production

## Impact

- Reduced carbon footprint up to 45%
- Increased productivity of greenhouse production with high efficiency of resources (water, nutrients,  $\text{CO}_2$ , energy)



# Stand Alone Farm Water Salinity Reducer



## Climate Challenge

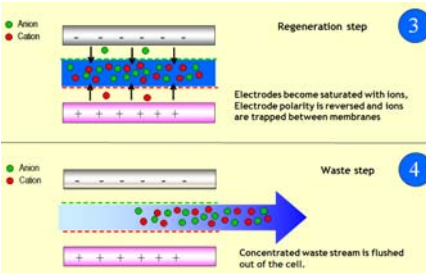
In coastal zones where fresh water is becoming scarce due to climate change, farmers must deal with saline surface and groundwater, that may cause damage to crops.



## Our solution

The Stand Alone Farm Water Salinity Reducer ('Fource') is a stand-alone device for decreasing the salinity of available water, running on solar panels and/or small windmills. It integrates components of proven technology:

- Membrane-CDI for the removal of salt
- Solar panels for energy supply
- TerraSen soil moisture sensor and Dacom Irrigation Advice Module



## Your benefit

- Decreasing salinity of surface and shallow groundwater to acceptable levels, optimized to crop development stage and soil
- Year-round fresh water security at reasonable cost
- Low energy consumption due to use of solar panels or small windmills
- Saving money on water supply infrastructure
- No added chemicals, high water recovery rate



## Impact

- Undoing salinization
- Providing an energy neutral service
- Decreasing the need to supply fresh water from elsewhere



## Climate Challenge

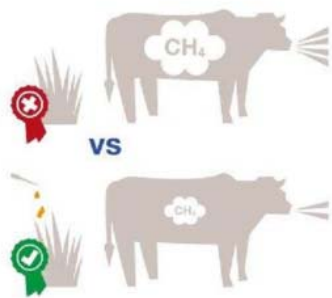
The Global demand for food is expected to increase 60% by 2050. To meet this demand, the worldwide production of meat and milk is projected to double. Animal production in particular ruminant production is responsible for a significant part of the global GHG Emissions.



## Our solution

### AGOLIN RUMINANT

- is a feed additive consisting of high quality plant extracts from e.g. coriander, nutmeg or wild carrot designed to optimize ruminant feed intake and feed utilization.
- is based on botanical compounds, which are effective, easy to use and safe.



## Your benefit

- Reduced CH<sub>4</sub> emissions
- Organic compounds
- Increased yields (e.g milk)
- A more sustainable supply chain
- Potential to develop climate smart products

## Impact

- Reduces CH<sub>4</sub> emissions from EF by 10-25%
- Reduce Ammonia by about 10%
- Increases Feed Efficiency and yields
- Increases Food Protein used for Production

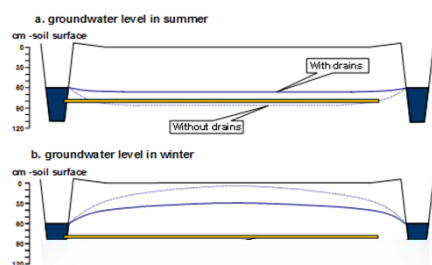


# Submerged drains



## Climate Challenge

Agricultural peat soils in the EU are a source of greenhouse gas emissions equal to 25 coal-fired power stations. In one century the subsidence due to peat oxidation in the western part of the Netherlands will be 1.5 meters. Experiments in The Netherlands show that raising groundwater levels by an effective and intelligent water management is a key factor to reduce GHG emissions and subsidence of agricultural peat soils.



## Our solution

Infiltration of ditch water via submerged drains to raise groundwater levels in dry summers can reduce peat oxidation, emissions and subsidence by 50%.



## Your benefit

- Farmers: improved groundwater levels for farming, bearing capacity, soil nutrient stocks. crop & feedstock production
- Regional & national authorities: carbon credits and reduced land subsidence

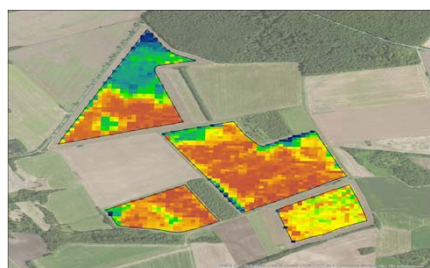
## Impact

- Reduced GHG emissions
- Reduced land subsidence
- Improved crop and feedstock production



## Climate Challenge

The Global demand for food is expected to increase 60 % by 2050. Effects of climate change will be more pressing in the future. These conditions will require agriculture systems to be more productive, use inputs more efficiently, have more stability in their outputs and more resilience against climate variability.



## Our solution

### Green Spin FARM

- uses satellite imagery combined with weather and soil data to create soil maps for informed decision making
- Allows you to estimate yield potential and make yield prognoses as well as to measure biomass vitality



## Your benefit

- matching farming practices more closely to crop needs
- Reducing costs and fertilizer use
- Improved decision-making
- Reducing environmental risks and footprint



## Climate Challenge

The Global demand for food is expected to increase 60 % by 2050. Effects of climate change will be more pressing in the future. These conditions will require agriculture systems to be more productive, use inputs more efficiently, have more stability in their outputs and more resilience against climate variability.



## Our solution

### AgriCircle

- is an easy to use online farm management interface
- it integrates high resolved satellite imagery, GIS and remote sensing data
- it allows you to manage your farm more efficiently and connects you with market services that matter to you



## Your benefit

- Product and forecast improvements based on data clusters
- Direct channel and influence on production through efficient task management
- Input cost reductions
- Price estimations of commodities and consulting on trade and what to grow
- Reduction of GHG emissions





# Cool Farm Tool



## Climate Challenge

The Global demand for food is expected to increase 60 % by 2050. Animal and crop production are responsible for a large part of the global GHG emissions. A tool to measure GHG emissions is key to reduce the carbon footprint of global supply chains and to manage them in a more sustainable way.



## Our solution

### The Cool Farm Tool

- Is an easy to use GHG calculator for growers to help them measure the carbon footprint of crop and livestock products
- Allows to try out “what if” scenarios
- It is used by renown multinational companies such as Marks&Spencer, TESCO, McCain, Heinz tomato etc.



## Your benefit

- More information about your supply chain
- Reduction of your environmental footprint
- Identify additional revenue streams
- Optimization of farm management



## Impact

- Several case studies show a reduction of GHG emissions in transportation, feed production, manure management etc. Also, new revenue streams could be identified.



## Climate Challenge

Climate change is strongly impacting the vine phenology and the wine quality in all vineyards of the world. Ripeness period is earlier and water balance is changing, affecting potential yields, grape composition and wine typicity, with dramatic consequences on wine growers incomes and regional economies.



## Our solution

Fruition Science Technology

- is a web-based platform connected with sources of data in vineyards : sap flow sensors, drones, meteo station
- Provides key information through maps and graphs for precise irrigation and comprehensive view of vineyard operations, according to wine quality goals.
- Is a decision tool for plantation, anticipating climate change

## Your benefit

- Better grape/wine quality with higher yields
- Reduction of vintage variability
- To adapt the vineyard to long term impact of climate change



## Impact

- Optimization of water use
- To maintain incomes, jobs, landscape in rural area with impacts on tourism and cultural activity

# Integrated irrigation system



## Climate Challenge

The Global demand for food is expected to increase 60 % by 2050. Effects of climate change will be more pressing in the future. These conditions will require agriculture systems to be more productive, use inputs more efficiently, have more stability in their outputs and more resilience against climate variability. Water will be a critical resource to save.



## Our solution

Integrated crop irrigation system provides an efficient solution to crop water requirements and nutrition.

The system adopts drip irrigation and it consists of a pumping unit properly sized, automatic filter low pressures model (2.0 bar), adequate sizing of pipe for reducing loss of pressure, integral dripper with very low cv, sub irrigation system near radical parts, a monitoring of the water content of the soil



## Your benefit

- Production +15%
- Quality ++

- Labour ---



## Impact

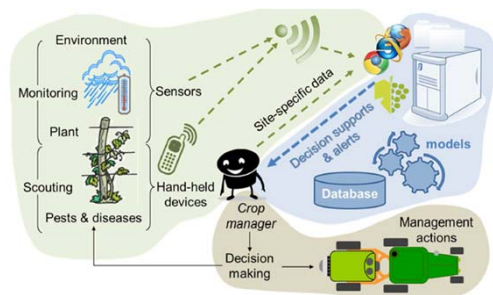
- Water ---
- Energy –
- CO<sub>2</sub> -





## Climate Challenge

The Global demand for food is expected to increase 60 % by 2050. Effects of climate change will be more pressing in the future. These conditions will require agriculture systems to be more productive, use inputs more efficiently, have more stability in their outputs and more resilience against climate variability.



## Our solution

Decision Support Systems (vite.net® and granoduro.net®) developed by Horta Srl are web-based systems able to: (i) collect, organise, and integrate several types of information required for producing a crop, (ii) analyse and interpret the information, and (iii) use the analysis to recommend the most appropriate action or action choices.



## Your benefit

Real-time monitoring of weather data.  
Simulations of fungal diseases, pests and plant development, abiotic stresses (i.e. low temperature and water stress).  
Plant protection products database and optimal dose calculator, register for crop management activities

## Impact

The DSSs allow to rationalize the use of resources, both natural (e.g., water) and technical inputs (e.g., plant protection products), implementing a cropping system consistent with the principles of sustainable agriculture, as acknowledged by the 2009/128/EC Directive.



# Methane Tractor T6.140



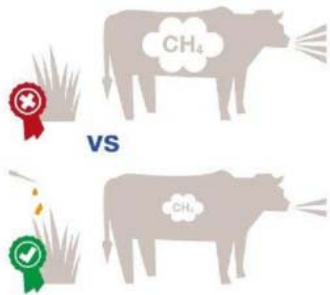
## Climate Challenge

The Global demand for food is expected to increase 70 % by 2050. Effects of climate change will be more pressing in the future. These conditions will require agriculture systems to be more productive, use inputs more efficiently, have more stability in their outputs and more resilience against climate variability.



## Our solution

T6.140 Methane Power, enjoys all of the features of a standard tractor and is equipped with a four cylinder, 3 litre engine. It develops a maximum power of 135hp and 620Nm torque. The 50kg capacity delivers approximately half a day of autonomy during normal operation. The tractor maintains similar visibility and operational ground clearance as standard models.



## Your benefit

- Cost savings between 25% and 40% can be achieved when compared with conventional fuels
- “Energy Independent Farm” and “Clean energy leader”

## Impact

- Methane propulsion technology offers numerous environmental advantages.
- emissions 80% lower than a standard diesel engine
  - carbon impact is virtually zero



## Climate Challenge

The Global demand for food is expected to increase 60 % by 2050, while agriculture footprint and resources consumption should not grow. A key tool to attain sustainability of agriculture is genetic improvement of staple crops, which have to become more efficient, adapted and resilient, keeping at the same time their safety, nutritional and quality value.



## Our solution

Our durum wheat varieties:

- are expressly selected to meet the technological, food safety and nutritional requirement of the pasta industry
- are tried in different environments and under different agricultural practices in order to improve resources use efficiency and to technically address the farmers
- are developed to be used in local production chains



## Your benefit

- Innovative varieties for sustainable agriculture
- Product compliance to industry requirements
- Less need of long distance transport
- Pasta safety and quality



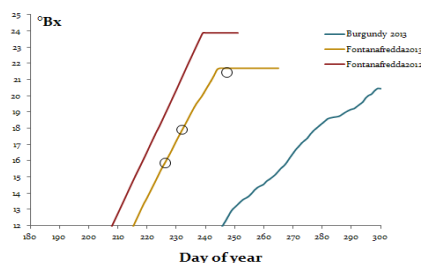
## Impact

- Improved resources use efficiency
- Improved quality in locally based chains



## Climate Challenge

Vine growers are already facing important changes in grapevine phenology and organoleptic properties of grapes due to climate change.



## Our solution

### RIPEGRAPE

- A tool which calculates at veraison the reachable sugar concentration. If linked with long-term weather forecasts, the tool simulates berry ripening (sugar and acidity) at daily time scale.



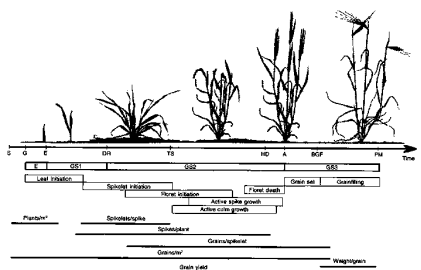
## Your benefit

- The forecasts of ripening trend with final sugar concentration.
- A supporting tool in order to schedule weeks in advance the best days for harvest.



## Climate Challenge

Global warming is affecting the traditional scheduling of cereal management. Moreover the more frequent extreme events can easily drop final yields.



## Our solution

### TRITITOOL

The software, based on agrometeorological models, computes for winter and durum wheat:

- 1) phenology stage;
- 2) yield estimation.



## Your benefit

- Better scheduling of agronomic management
- Scenarios at regional scale of wheat growth trend.



## Impact

- Smarter use of time and agronomic inputs





## Climate Challenge

Food and feed demand is increasing. Herbaceous perennial crops can be a smart solution to produce energy from biomass without grabbing land to the traditional agriculture



## Our solution

ARMIDAPP  
Calculator of potential yield for perennial herbaceous crop based on a recent model developed by ARPA-ER.  
Usable for feasibility studies and yield forecasts.



## Your benefit

- You can establish the best energy crop for your field through a fast feasibility study.

- Best yields



## Impact

Support to sustainable crop:

- few agronomic inputs
- increase organic carbon in soil
- no irrigation needs
- use of marginal lands



## Climate Challenge

Agriculture is responsible for a large part of global CO<sub>2</sub> emissions. Moreover, more than 30% of fresh products is lost before to reach the consumers. This is not sustainable in future scenarios with more than 9 billions people in the world.



## Our solution

**HIGHLY PERISHABLE FRUIT CONSUME FORECAST**  
We provide algorithms which transform the weather forecast into a demand forecast of highly perishable fruits and vegetables.



## Your benefit

- to assess weeks in advance the fruit demand;
- better stock management;
- to rationalise the fruit purchase;
- to reduce the food waste;



## Impact

- CO<sub>2</sub> emissions reduction due to a better ware management;
- decrease of food losses and waste.