

Winter 2014

## The AgEng Community celebrates its successes in 2014

Back in July the agricultural engineering community came together to share the latest agricultural innovations and developments in Zurich. AgEng2014 was a resounding success with 365 participants from over 50 nations.

It was a pleasure meeting so many of you in Zurich; to catch up with past contacts and meet new acquaintances and have useful discussions at the conference and in the 'side-meetings' both official and informal.

Of course we hope that all of you who were able to attend also had a useful time, as well as enjoying the impressive surroundings of ETH and Zurich and we know that you were well supported by Thomas Anken and his colleagues from AgroScope who looked after us all. Of course the Zurich hospitality really shone at the gala dinner when, amongst the musical entertainment and EurAgEng prize giving, we had an amazing World Cup semi-final match when Germany did incredibly well against Brazil.

There are still photos of the conference by Gabriela Brändle on the [www.ageng2014.ch](http://www.ageng2014.ch) homepage and the papers will be available at [www.eurageng.eu](http://www.eurageng.eu) quite soon. Keep watching the 'e-Update' for a link.

It was also an opportunity to celebrate the success of individuals in the agricultural engineering community and EurAgEng was proud to present the following awards:



### Biosystems Engineering Outstanding Papers

You would have seen the shortlist of candidates for this award in the summer Newsletter. The prize is presented to the best papers published in our Journal, *Biosystems Engineering*, over the last two years.

Here are the winners:

- **E2D-ROPS: Development and tests of an automatically deployable, in height and width, front-mounted ROPS for narrow-track tractors**  
by **Tomás Ballesteros, Ignacio Arana, Amaya Pérez Ezcurdia, José R Alfaro**
- **A CFD greenhouse night-time condensation model.**  
by **Daive Piscia, Juan I Montero, Esteban Baeza, Bernard J Bailey**
- **Tractor-based Real-time Kinematic-Global Positioning System (RTK-GPS) guidance system for geospatial mapping of row crop transplant.**  
by **Manuel Perez-Ruiz, David C Slaughter, C Gliever, Shrinii K Upadhyaya**

### EurAgEng Recognition Award

EurAgEng would not exist without the support of individuals who give up their time to develop and run the organisation.

This year four individuals were honored:

- **Prof. Dr.-Ing. Peter Schulze Lammers**, University of Bonn
- **László Fenyvesi**, Hungarian Institute of Agricultural Engineering, Gödöllő
- **Thomas Anken**, AgroScope, Switzerland
- **Robert Kaufmann**, AgroScope, Switzerland and outgoing EurAgEng president.

EurAgEng is keen to encourage a new generation of agricultural engineers and for the first time in Zurich an award was made for the best paper presented at the conference by young engineers.

- **Robbe Van Beers, Lorenzo León Gutiérrez, Ann Schenk, Bart Nicolaï, Erdal Kayacan and Wouter Saeys**

as authors of a paper on

**Optical measurement techniques for ripeness determination of Braeburn apples**

were awarded the **Young Engineers Best Paper Award**

*continues over*

# Dear colleagues,

It is for me a real honor to become president of EurAgEng.

I start this new position with humility when I remember the names of those prestigious people that have also been President of EurAgEng. It will be a challenge to try to be as effective as they were at promoting agricultural engineers in Europe and more widely.

First of all I would like to thank Robert Kaufmann for the excellent job he has done as President, despite the severe accident he had.

Thanks to Robert and his team at Agroscope for making the AgEng2014 conference a remarkable success. It would be too long to highlight the qualities and achievements of all the former EurAgEng Presidents; I would just like to take the opportunity of a few lines to remember my only French pred-

ecessor: Professor Francis Sevilla.

Francis, not only was the organiser of AgEng1988 in Paris, but he was also the first President in 1992-93. He was a colleague of mine when he was in Cemagref and he accepted the chair of the scientific committee for the AgEng2010 conference when he was already ill and would be carried off so quickly.

Francis will stay as an example for all of us and I am glad that the EurAgEng Award for Young Professional is named in his honour.

I would like to say that EurAgEng would not be so effective without the tenacity of our Secretary General, David Tinker and his marvelous wife and assistant Nicky. Thank you for their efficacy and their availability!

Our Society has great challenges to tackle. It has been clearly explained to us, not only during the last AgEng conferences but also during the 2013 Club of Bologna meeting.

The increase in the world population, the impact of global climate change and the scarcity of energy and natural resources make it necessary to produce more, and in a more efficient way. Technologies, especially those involving engineering applied to agriculture, are key players for building an optimistic future.

We EurAgEng members, able to

integrate engineering science and design with applied biological, environmental and agricultural sciences, have a crucial part to play. I hope that there will be many of us EurAgEng members on 22nd February

at SIMA-Paris to discuss this subject during our conference 'How do EurAgEng and agricultural engineers contribute to innovation for sustainable intensification of agriculture?' (Keep an eye on 'e-Update' for full details).

To be successful we have to recruit more and more young engineers and scientists in our national societies and have new members coming from the Eastern European countries while we cooperate with colleagues from developing countries and CIGR.

I face our future with optimism and enthusiasm because I know that I can rely on each of you.

Emmanuel Hugo



EurAgEng desk at AgEng2014 with the Secretariat sorting something on the laptop

## AgEng2014, Zurich

**The Innovation and Development Award** was sponsored by Sepp Knüsel of RIGITRAC and it went to the best paper on 'Innovation and Development' from industry, or a combination of industry and academia, and presented at the conference.

The 2014 winners were:

- **X. Song, J.J.W. Schutte, P.P.J. van der Tol, F.E.D. van Halsema, P.W.G. Groot Koer-kamp**

as authors of a paper on

**Body measurements of dairy calf using a 3-D camera in an automatic feeding system**

The Spaniards were triumphant in the two top awards, the **Francis Sevilla Young**

**Professional Award**, sponsored by John Deere and the **EurAgEng Award of Merit - Scientific Understanding**.

Pictured right are **Eutiquio Gallego Vázquez** from the Technical University of Madrid with his Francis Sevilla Young Professional Award and **Professor Margarita Ruiz-Altisent**, also from Madrid and founder of LPF-TAGRALIA (Advanced techniques in Agri-Food), with the highest award, the EurAgEng Award of Merit - Scientific Understanding.

These awards were presented at the conference dinner held on the shores of Lake Zurich.

Congratulations to all the winners!

David Tinker

Thanks to Gabriela Brändle, Agroscope for the photos



Eutiquio Gallego Vázquez and Professor Margarita Ruiz-Altisent



EurAgEng Recognition Award winners - Peter Schulze Lammers, Robert Kaufmann, Thomas Anken and László Fenyvesi



Robbe Van Beers for Young Engineers' Best Paper Award



# From the Secretary General

## What now that AgEng2014 is over? - DAVID TINKER



Well I hope that you had a good time in Zurich and the technical tours that followed. These were popular and gave us all a taste of Swiss agriculture and its wine and cheese!

On the way back Nicky and I stopped at a French farm/vineyard for bed and breakfast and were taken on a tour of the farm. It was mainly vines but also had saffron, olives and a newly planted oak orchard for truffles.

The weather station and disease modelling system that the farmer had recently installed was paying for itself quickly as it had reduced the frequency of fungicide applications normally needed for the vines. The farmer / vigneron had also had the distribution of chemical from his vine sprayer checked and found that it was worse than expected; but had been easy to correct.

I didn't manage to determine if it was the same IRSTEA/IFV system that was in the Summer 2014 copy of this Newsletter but it was good to hear from a farmer that he is happy with the results of agricultural engineers!

Following on; it looks as though the October Workshop on Standardised Procedures for the Inspection of Sprayers in Europe (SPISE) was successful and popular and presentations are available (<http://spise.jki.bund.de/index.php?menuid=32>)

EurAgEng had a change-over of President at AgEng2014 so welcome Emmanuel Hugo and thanks to Robert Kaufmann for leading us to AgEng2014. The new President was invited by SIMA to arrange a EurAgEng seminar next February and we are working on

that now. Keep an eye on the 'Email Update' for more information.

I have been to a variety of events and meetings, some to sit and listen and others to work at and tell people what is going on with engineering for agriculture.

You can see some of this in the selection of articles that I managed to find for this Newsletter. I hope that you enjoy them and that they give you something to think about and discuss with your colleagues.

I also had a brief trip to the Field Robot Event. As always it was good to see what the students are doing and I must thank Prof Hans Griepentrog and his team from the University of Hohenheim, and all the sponsors, especially DLG for allowing it to be run at a Field Day and Claas Stiftung for helping to get new teams there.

Final results and plenty of pictures are at <https://fre2014.uni-hohenheim.de>.



FRE 2014 was hot and sunny, even for the robots!



Quick reminders:

- Use the Member Login on the EurAgEng website to find people and to use the FREE CABI agricultural engineering abstracts.
- Don't forget to send CABI copies of your seminar or conference proceedings and any important (public) reports.
- Check the 'Events' for ideas about where to present work.
- The 'LandTechnik' Journal is going to be open access next year with free downloads of papers <https://www.landtechnik-online.eu/en>
- Innovations: for EIMA are at <http://www.eima.it/pdf/opuscolo-novita-tecnico-2014.pdf> and
- I hope that some of you will be able to be at the EurAgEng Seminar, Sunday 22 February 2015

Finally it is time to wish you all a Merry Christmas and excellent 2015.

David Tinker

## Europe's Agri Food Businesses called for an EU policy shift towards innovation

### The agri-food sectors presented policy recommendations to EU farm ministers to unlock the potential of Europe's agricultural and food industries to masterkey challenges and opportunities

A broad coalition of groups representing Europe's agricultural and food business interests has called for better and smarter policy making that fosters innovation and creates jobs, ensuring that the EU agri-food chain becomes more productive and resource efficient.

The group of 11 EU level associations presented their joint 'Vision for unlocking the potential of agriculture and food industries in the EU' during the meeting of EU Ministers for Agriculture in Athens on 6 May. The coalition includes numerous agricultural input industries such as suppliers of machinery, seed, fertilisers, crop protection, animal health, feed and biotechnology based products, as well as the agricultural trade and of course EU farmers and the European food and drink sector. Together, these industries account for about 30million jobs and 3.5% of the EU's gross value added<sup>1</sup>.

In their 'Joint Vision', the signatories underlined the importance of providing a secure and safe supply of food not only for EU citizens but also beyond Europe's borders, and to do so in a sustainable and environmentally friendly manner.

At the same time, the European Agri Food Chain points to the economic weight of the sectors involved and of their important relevance in achieving over-arching EU policy goals such as higher employment and economic growth. The group is united in its call for a more streamlined EU policy agenda that places the promotion of innovation at its very core in order to sustain a safe, high quality and affordable food production and consequent choice for consumers.

Innovation in agri-food has been too little encouraged and in some cases has been actively hampered by European decision makers.

In view of the European Parliament elections and the new European Commission to take office later this year, the agri-food associations urge both institutions to work jointly for a strong stimulus to innovation in their sectors by better and science based policy making and by strengthening the innovative forces of the internal market.

The EU Agri Food Chain sees its joint vision as a first step in this direction and stands ready



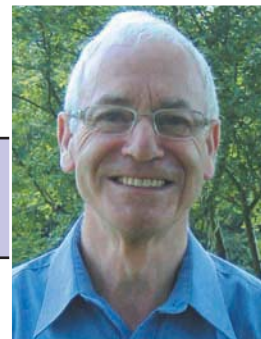
to work with EU decision-makers of all institutions to achieve the common goal of a competitive and sustainable Europe that turns today's challenges into tomorrow's opportunities by smarter regulations that support innovation all across the agri-food chain.

<sup>1</sup>CELCAA (European Liaison Committee for the Agricultural and Agri Food Trade), CEMA (European Agricultural Machinery), COCERAL (European Association of cereals, rice, feedstuffs, oilseeds, olive oil, oils and fats and agro-supply trade), Copia Cogeca (European Farmers and Agri Cooperatives), ECPA (European Crop Protection Association), ESA (European Seed Association), EuropaBio (European Associations for Bio Industries), FEFAC (European Feed Manufacturers Federation), Fertilisers Europe (European Fertilisers Association), FoodDrinkEurope (European Food and Drink Industry Association), IFAH Europe (European Animal Health Industry)

# Saving soil with intelligent machine use

Did we really run over our fields at random in 30 ton farming vehicles?

TIM CHAMEN, a plenary speaker at AgEng2014, wrote this blog for 'Global Food Security' based on his AgEng2014 talk. ([www.foodsecurity.ac.uk/index.html](http://www.foodsecurity.ac.uk/index.html))



Speak to any experienced garden vegetable grower about the acceptability of running a car over their vegetable plot and I guess they would look at you in horror!

And yet this is what farmers worldwide have done with their machines for many years because of the difficulty of doing otherwise. As the drive for improved production efficiency has risen together with labour costs, farm machines have increased dramatically in size and crucially in weight.

When soil at 0.5m depth changes (and mostly for the worse) as a result of surface pressure, it is often uneconomic to repair in the short term and may take decades through natural processes. And the process is self-perpetuating: a heavier machine creates more compaction and a yet bigger and more powerful tractor is needed to try and remove it! It's a vicious circle and yet there's been little impetus to break it.

Soil compaction is a serious problem. Crop yields on average are reduced by 12% due to soil compaction while energy inputs can often be doubled. Similarly, compacted soils don't absorb as much water leading to fertiliser run-off, soil erosion and loss of chemicals and nutrients. Water-logging events can also rise, leading to increased emissions of nitrous oxide, a gas about 300 times more damaging to the atmosphere than carbon dioxide.

## CONTROLLED TRAFFIC FARMING

What then is the solution?

Although we can't tend the land without running on it, there is now a clever way of confining wheels or tracks to narrow strips in the field to just 15% of the area, something we call 'Controlled Traffic Farming' (CTF).

This has been made possible (or at least a lot easier) over the last decade or so by global navigation satellite systems (GNSS, more commonly referred to as GPS). Top guidance equipment can now auto-steer most farm machines to an accuracy of about 2cm; an amazing feat considering the complexity and speed of calculations needed!

But there is far more to achieving CTF than just investing in GNSS technology; all

the machines in the farming system must match up in working width and the distance between the wheels or tracks. Manufacturers of farm machines have never considered this in their designs, but that is now changing and the benefits to farmers, food production and the environment are widespread and significant.

[An animation showing CTF is available at [www.controlledtrafficfarming.com/downloads/Englishindex.html](http://www.controlledtrafficfarming.com/downloads/Englishindex.html)]

## WHERE TO FROM HERE?

For the past ten years, CTF (Europe) Ltd as a small advocacy organisation have tried to facilitate CTF systems in Europe, but uptake is still limited.

At present, only about 1.5% of the arable area in the UK is in CTF, and a much smaller proportion in Europe as a whole, while it's practically absent in the developing world.



Tim Chamen checking severity of soil compaction with a fork!

One wonders why the EU or national governments have not been more supportive in promoting these systems when they so obviously lead to increased production efficiency with reduced environmental impact - something they have been harping on about for many years!

One of the main barriers to adoption may be the perceived extra cost. In reality, farms often save huge amounts on machinery investment (number and size of tractors for example) and their running costs consistently fall. CTF is still often left out of the debate in the popular farming press when it so obviously addresses the problems that are being discussed, and this is very frustrating.

What's more, change in agriculture is notoriously slow, largely because many individuals are involved, with each having to be made aware of CTF and then convinced that it is in their interests to change. CTF also needs a fair bit of thought but once introduced makes life a lot easier.

On the positive side, Australia already has widespread adoption and is spending Aus\$ 3 million on CTF research. Adoption there has been driven by water availability - compacted soils are very poor at holding on to water!

And getting farmers converted with existing equipment is only the beginning; far greater things can be achieved with a complete revision of our mechanisation systems as envisaged by Halkett\* in the 1850s! He recognised the compaction issue and devised a machine, using rail tracks as a gantry and steam power, that would leave 95% of any field free of compaction for all time, boosting yield and maintaining soil quality.

We must improve the uptake of CTF in Europe to at least a quarter of the area farmed. Otherwise it will remain an issue we'll only have to address in years to come, with some disbelief that we didn't tackle it sooner.

\*[www.jstor.org/stable/41334925?seq=1](http://www.jstor.org/stable/41334925?seq=1)

More information on CTF can be found at [www.controlledtrafficfarming.com](http://www.controlledtrafficfarming.com)



Earlier in 2014 James Andrews of the *Farmers Weekly* magazine wondered how much heavier machines were now compared to the early 1970s when the Ford 5000 (75hp/56kW and 2.68t) was quite a large tractor (at least that is how SecGen David Tinker remembers it!)

# 10 of the heaviest farm machines

## The benchmark

### Ford 5000

In 1975 the Ford 5000 was one of the most popular tractors on the market. Its four-cylinder engine pumped out 75hp and it weighed just 2.68t.



## The tractors

### 1. Claas Xerion 5000VC

The German maker's 517hp Xerion tips the scales at a meaty 17.45t (6.5 Ford 5000s).



### 2. John Deere 9560R

Deere's articulated monster weighs in at 18.84t (7 Ford 5000s).



### 3. Challenger MT875E

The V12-engined crawler from Challenger pumps out 590hp and weighs 19.3t (7.2 Ford 5000s).



### 4. Case-IH Quadtrac 620

It's the biggest tractor in Case-IH's line-up and a favourite among East-Anglian farmers. The 620hp Quadtrac weighs 24.4t (9 Ford 5000s).



### 5. Versatile Delta Track

Versatile's Delta Track is the heaviest tractor you can buy in the UK, weighing in at whopping 27t (10 Ford 5000s).



## Other heavyweights

### 6. Dammann 3200 sprayer

Dammann's tri-axle self-propelled sprayer can hold 13t worth of liquid and with a full load on board weighs 25t (9.3 Ford 5000s).



### 7. Claas Lexion 780 Terra Trac



Claas' flagship Lexion 780 with track units, an acre-gobbling 12m header up front and a tank full of wheat weighs 32.6t (12.2 Ford 5000s).

### 8. PMC potato harvester

This self-propelled potato harvester from PMC weighs 29.5t empty and with a full load of spuds on board tips the scales at 41.5t (15.5 Ford 5000s).



### 9. Vredo slurry tanker

Dutch maker Vredo has taken slurry spreading to an industrial scale. The VT5518 with a full tank weighs 44t (16.4 Ford 5000s).



### 10. Holmer T4-40 beet harvester

The heavyweight farm machinery title goes the T4-40 beet-harvesting behemoth from Holmer.



Empty it weighs 32t and its capacity to almost carry its own bodyweight in beet pushes the total to a earth-crushing 62t (23 Ford 5000s).

# Robotics and Internet of Things

The following is based on articles read by David when browsing the web looking for information which he thinks would be of use to engineers in agriculture, especially if they include \$10,000 of prizes! Good luck. Of course they might also make interesting Christmas presents!

The Harvard Biodesign Lab people at <http://softroboticstoolkit.com> are announcing the 2015 Soft Robotics Competitions!

The Soft Robotics Toolkit team has announced two competitions intended to reward students, researchers, makers, and designers of all levels for their contributions to the field of soft robotics.

The competitions include \$10,000 in prizes! See the competition pages for more details on how to participate at <http://softroboticstoolkit.com/soft-robotics-awards-2015>

## What is soft robotics?

Soft robotics is a growing field that takes inspiration from biological systems to combine classical principles of robot design with the study of soft, flexible materials.

Many animals and plants are composed primarily of soft, elastic structures which are capable of complex movement as well as adaptation to their environment. These natural systems have inspired the development of soft robotic systems, in which the careful design of component geometry allows complex motions to be 'pre-programmed' into flexible and elastomeric materials.

The use of compliant materials to embed intelligence in the mechanics of the body enables designers to simplify the more complex mechanisms and software control systems used in traditional, rigid robotics. The inherent compliance of soft robots makes them highly adaptable to a wide range of tasks and environments. In particular, they are ideally suited for interactions with humans, from assisting with daily activities to performing minimally invasive surgery.



The Soft Robotics Toolkit is a collection of shared resources to support the design, fabrication, modelling, characterisation, and control of soft robotic devices.

The toolkit was developed as part of educational research being undertaken in the Harvard Biodesign Lab. The ultimate aim of the toolkit is to advance the field of soft robotics by allowing designers and researchers to build upon each other's work. The toolkit includes an open source fluidic control board, detailed design documentation describing a wide range of soft robotic components (including actuators and sensors), and related files that can be downloaded and used in the design, manufacture, and operation of soft robots. In combination with low material costs and increasingly accessible rapid prototyping technologies such as 3D printers, laser cutters, and CNC mills, the toolkit enables soft robotic components to be produced easily and affordably.

Each section of the site focuses on a soft robotic device or component, and includes the following sections:

1. **Design:** A description of the device and how it works, with related design files that can be downloaded and guidelines on potential modifications you could make to the design.
2. **Fabrication:** A bill of materials listing all of the parts, materials, and equipment you will need to build your own device, plus a detailed set of instructions for you to follow.
3. **Modelling:** A discussion of modelling and analysis approaches you can use to predict and understand the behaviour of the device and optimise your design.
4. **Testing:** In order to validate your models and better understand your device, you will need to carry out empirical tests. This section describes the tests that other designers and researchers have carried out and that may provide inspiration for the design of your own experiments.
5. **Case Studies:** Examples of how others have used the device or component for real-world applications.
6. **Downloads:** All of the files related to the design, fabrication, modelling, testing, and control of the device.

If you have an interest in advancing the field and engaging with this community, please get in touch with The Soft Robotics Toolkit team.

## SAM: THE INTERNET OF EVERYTHING FOR EVERYONE

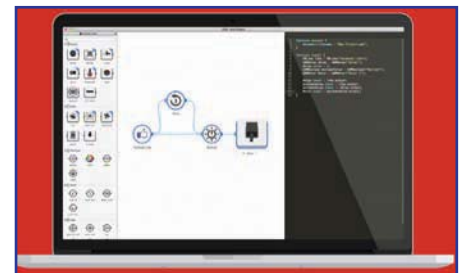
An idea from crowd-funded SAM Labs aims to sell, from March 2015, kits to enable children, students and others to build their own Internet of Things.

This ultimate IoT kit aims to lower the barriers to entry for individuals and businesses.

SAM Labs, a London based start-up, has launched a pioneering Development Kit that drastically lowers the barriers to entry in the Internet of Things market. Start-ups to corporates, or even school students, with an innovative idea that connects everyday objects to the Internet, can use SAM to bring it to life and without the need for an engineering degree.

SAM Labs CEO, Joachim Horn, explains, "SAM's Bluetooth-connected modules can be used to build anything from fridges that create grocery lists, to skateboards that record and post tricks to the web, to bicycle signalling jackets; all easily programmed with the SAM app. We want to level the playing field in innovation development, away from corporations with millions to spend on development and empower kids, young designers, start-ups, and small businesses."

SAMs, or Sensor Actor Modules, are electronic building blocks connected to each other and to the Internet (pictured above). They function without wires or coding.



The SAM app (above) is based on the intuitive Flow-Based-Programming model that engages the user with physical computing: code on screen creates an action off-screen.

SAM also changes how we learn about technology.

More information at <http://samlabs.me/#start>



# EVENTS

## EURAGENG EVENTS

### FEBRUARY 2015

**22-25 SIMA 2015**

Paris, France

<http://en.simaonline.com/>

'How do EurAgEng and agricultural engineers contribute to innovation for sustainable intensification of agriculture?'

14:00-17:00 Sunday 22nd Feb. Watch out for more details.

### NOVEMBER 2015

**6-7 Land.Technik AgEng 2015**

Hannover, Germany

[www.vdi.de/landtechnik-ageng](http://www.vdi.de/landtechnik-ageng)

### JUNE 2016

**26-29 4th CIGR International - AgEng Conference 2016 - Robotics, Environment and Food Safety**

Aarhus, Denmark

## SPONSORED EVENTS

### FEBRUARY 2015

**16-20 50th Croatian & 10th International Symposium on Agriculture**  
Opatija, Croatia

**24-27 43rd International Symposium Actual Tasks on Agricultural Engineering**  
Opatija, Croatia

[http://atae.agr.hr/Zbornik\\_2014.pdf](http://atae.agr.hr/Zbornik_2014.pdf) - for last year's proceedings

### MARCH 2015

**10-11 Efficiency of Mobile Machines and their Applications**  
Braunschweig, Germany

<https://www.tu-braunschweig.de/imm/emma>

### JUNE 2015

**1-3 VIII Congreso Ibérico de Agroingeniería**  
Orihuela - Algorfa, Alicante (Spain)

<http://www.agroingenieria2015.com/>

**14-16 2nd International Controlled Traffic Farming Conference**  
Location to be confirmed

[www.controlledtraffickingfarming.com/Home/Default.aspx](http://www.controlledtraffickingfarming.com/Home/Default.aspx)

**22-23 New Frontiers of Biosystems and Agricultural Engineering for Feeding the Planet**

Naples, Italy

[URSO@unina.it](mailto:URSO@unina.it)

Submission of abstracts deadline  
14th February 2015

### JULY 2015

**12-16 10th ECPA meeting 'Precision agriculture for efficient resources management under changing global conditions'**

ARO Volcani Centre, Israel

<http://www.ecpa2015.com/>

**19-23 GreenSys 2015**

Evora, Portugal

[www.greensys2015.uevora.pt](http://www.greensys2015.uevora.pt)

### SEPTEMBER 2015

**8-10 Construction, Technology and Environment in Farm Animal Husbandry**

Friesing-Weihestephan, Germany

<http://www.btu-tagung.de/>



## OTHER EVENTS

### MARCH 2015

**9-10 2nd Global Forum for Innovations in Agriculture**  
Abu Dhabi

[www.innovationsinagriculture.com](http://www.innovationsinagriculture.com)

### APRIL 2015

**8-12 II International Agriculture, Food and Gastronomy Congress**  
Antalya, Turkey

<http://www.sesrtic.org/event-detail.php?id=640> - for details of the 2012 congress

**21-24 8th Asian Buffalo Congress**

Istanbul, Turkey

<http://abc2015.org/>

### MAY 2015

**19-22 FRUTIC Italy 2015**

Milan, Italy

<http://www.aidic.it/frutic/>

**26-28 XXXVI CIOSTA CIGRV Conference 2015 Environmentally Friendly Agriculture and Forestry for Future Generations**

St Petersburg, Russia

[info@ciosta2015.org](mailto:info@ciosta2015.org)

### JULY 2015

**26-29 ASABE 2015 Annual International Meeting**  
New Orleans Louisiana

<http://www.asabe.org/meetings-events.aspx>

### OCTOBER 2015

**11-14 2nd International Conference on Global Food Security**  
Cornell University, New York

[www.globalfoodsecurityconference.com/index.html](http://www.globalfoodsecurityconference.com/index.html)

View all forthcoming events online, visit:  
[www.eurageng.eu/events](http://www.eurageng.eu/events)

# Researchers from the University of Palermo (Italy) design a prototype malaxer

## To enhance extra virgin olive oil quality

An innovative prototype malaxer to enhance extra virgin olive oil quality was shown last October 29th by Pietro Catania and Mariangela Vallone from the Department of Agricultural and Forest Sciences of the University of Palermo, Italy.

The two researchers designed the machine that was realised by Puleo Srl company (Marsala, Italy).

“In recent years, oxygen content regulation during malaxation has been noted as a process parameter,” says Professor Pietro Catania, “but until today there were no systems allowing a real-time evaluation and automatic management of the oxygen amount in the malaxation machine headspace.”

This study was supported by Regional Department of Agricultural and Food Resources.

“Our prototype is based on the application of a system that allows the automatic and continuous management of the atmosphere composition in the malaxation machine headspace throughout the entire process lasting about 40 min, depending on the characteristics of the raw material”, explains Dr. Mariangela Vallone.

This is of fundamental importance to activate the enzyme complex in favour of the volatile compounds responsible for the positive aromatic notes of extra virgin olive oil without compromising its phenolic composition.

The prototype was tested in an oil mill located in the province of Trapani, Western Sicily, during the cropping season 2014 on Nocellara del Belice and Cerasuola varieties. “This prototype will allow us to carry out further studies on the management of the



“.. until today there were no systems allowing a real-time evaluation and automatic management of the oxygen amount in the malaxation machine headspace”

process parameters in the production of extra virgin olive oil with particular emphasis on its nutraceutical properties”, says

Professor Pietro Catania. In fact, the health benefits of the Mediterranean diet can be largely ascribed to the nutraceutical properties of extra-virgin olive oil.

For more information please contact:  
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