What you can do with IoT in agriculture

The big benefit, says Hermann Buitkamp, Secretary of ISO technical committee ISO/TC 23, Tractors and machinery for agriculture and forestry, subcommittee SC 19, Agricultural electronics, will be the various interesting aspects that IoT can bring about in agriculture. For example, sensors placed in fields allow farmers to obtain detailed maps of both the topography and resources in the area, as well as variables such as acidity and temperature of the soil. They can also access climate forecasts to predict weather patterns in the coming days and weeks.

“IoT will play a very important role for future farming and will enable farmers to be much more precise, with centimetre-level accuracies,” says Buitkamp. “Thus, the old scattergun approach is definitely a thing of the past.”

The benefits resulting from this are tremendous – both in an economic and ecological sense.

As we dream about all the exciting possibilities that IoT will bring to agriculture, our curiosity is piqued as to where standards for the technology can possibly fit into the equation? Well, there is an immense complexity that comes with bringing together a bunch of different types of technology. According to Buitkamp, that complexity remains one of the main stumbling blocks of technology adoption, but not one that can’t be overcome. “There are technical issues we have to fulfil along the path to success,” he explains. “We have to improve the wireless in-field communication, functional safety and repair and maintenance information in order to realize unified interfaces.”

Seeing is believing

The breadth and complexity of modern farm technologies can be a minefield, but it can be even more difficult to sort through effectively when related to IoT. Dr François Coallier, who has been involved in IT standardization for a number of years, is now leading the group of experts responsible for IoT within ISO/IEC JTC 1, the technical committee on information technology that ISO leads jointly with the International Electrotechnical Commission.

For him, it all boils down to managing complexities and increasing efficiencies. “Agriculture is, in many countries, already complex, especially if we include the supply chain. For instance, it is well known that half the world would starve if all international shipping came to a halt,” he says. This is where ISO/IEC JTC 1’s subcommittee SC 41 on IoT and related technologies comes into play.

While the new subcommittee has just been created, its group of experts can draw on the substantive work of two existing working groups that have paved the way for standards in this field. Coallier predicts that IoT, big data and other technologies that are sometime referred to as “smart ICT” are soon going to be in high demand. “Agriculture is a very important endeavour in our society,” he says. Thus the importance of IoT contributions in this sector.

One of the projects of SC 41 will give rise in the short term to a standard IoT reference framework. This framework will, among other things, encourage openness and transparency in the development of IoT system architectures and in their implementation. It will also provide a technology-neutral reference point to define further standards in IoT.

No doubt the development of International Standards in this maze of complexities will facilitate interoperability and systems integration, giving companies the ability to leverage this technology more efficiently and integrate it in many application areas such as agriculture. For Coallier, the subcommittee’s work will be crucial. “In the long term, as a systems committee, SC 41 should be one of the key players in enabling the elaboration of the IoT standards required by this technology to reach its full market and application potential,” he says.

A smart future

Producing good-quality, nutritious and affordable food in a world of 7.5 billion people is always going to be a huge challenge. And in a world of limited resources, a new hi-tech era will need to be ushered in where automation and data can help farmers address the many challenges of the future.

So what will farming look like in 40 years? Linking so many technologies means that waste will be limited, productivity will be maximized and the environment will be affected as little as possible. Yet one thing is clear, success will demand an enduring focus on driving standards development to ensure that the strides we are making with technology will continue to deliver the productivity and environmental benefits we would like to see over the next couple of decades.

The advances of the mid to late 20th century that so dramatically changed the field of agriculture are beginning to wane. “With the limit of the Green Revolution being reached,” says Coallier, “we need to find ways to feed our growing world population in a sustainable way. One approach is to be more efficient in the use of resources (including people) in producing food, and also eliminate waste in the supply chain. Thus the interest in IoT.”

Make no mistake, the future of farming is smart and it will feed tomorrow’s world.