Growing the Agriphotronics Market

This is a time of great opportunity in agriphotronics—the use of optics and photonics in agriculture—but the field faces challenges in two very different markets: wealthy and less-wealthy countries. This was one of the findings of a meeting on Advanced Spectroscopy in Precision Agriculture, held on 13-14 May 2019 at OSA headquarters, in Washington DC.

Agricultural products contribute about US$ 5 trillion to the global economy, and OIDA estimates the market for agricultural equipment and materials (including seed, feed, and fertilizer) at about US$ 650 billion. The cumulative investment in agricultural science lags far behind human medical science, but improvements in productivity are now needed to expand global food production to meet demand and keep food prices affordable. To this end, the industry is looking to so-called precision agriculture, also known as smart farming, or Farming 4.0 (imitating the idea of Industry 4.0).

OIDA estimates that the spending on so-called precision agricultural equipment is in the single-digit billions of dollars per year. Much of it requires optical technology, including hyperspectral imaging, to identify a range of parameters, such as soil hydration. Optics is already in use to analyze crops from satellites, drones, and at field level.

The timing is good, with private funding to precision agriculture start-ups increasing in recent years. There are reports of several billion dollars per year of new investment in these start-ups in recent years, and perhaps as much again in R&D spending to universities and corporate research labs. The chart shows funding in U.S. agricultural R&D, adjusted for inflation to 2013 dollars, showing declining funding from government agencies but strong growth in funding from the private sector.
The less-wealthy countries present a strikingly different market and set of challenges. Precision agriculture also promises great gains in productivity, but the market is fragmented among millions of small, individual farms that cannot afford the technology by themselves. Adoption will require investment from provincial governments or collective farm organizations who could share user-friendly information to farmers.

OIDA previously reported on agri photonics in the January 2016 issue of the OIDA Market Update, and OIDA will report on the meeting in an upcoming OIDA Market Update. OSA has reported on agri photonics in the November 2017 issue of OSA's Optics & Photonics News. For more information on this meeting and OIDA's presentation, contact Tom Hausken here.

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