Case studies

In order to give you a better understanding of how your operation might benefit from sensor networks, a few case studies are highlighted below. More details about these studies can be found in the referenced papers, or in other modules in this knowledge center.

Pot in Pot

Figure 14. Pot-in-pot production.

A large network was installed at a pot-in-pot operation as part of this project. The total cost of this 25-node network was $48,000 including installation, which was annualized over 3 years assuming a compound interest rate of 6%. We assumed 1/3 of the sensors and nodes would be replaced per annum starting in year 4.   Annual savings (pumping, management costs etc. for this operation) was $20,300, enough to pay off principal and interest on a 6% loan in a little under 9 months. Looked at another way, those savings would be enough to pay off all initial outlays on equipment and installation (about $48,000) in a little over 2 years. Yearly net savings (irrigation savings - system cost) were $5,300 per year, a 37.5% increase in annual profit. Locations that had higher pumping costs (i.e. operations using deep wells) or paying more for water would realize greater savings and thus greater increases in profit. Full details about the experiment can be found in the article: Belayneh et al, 2013 at the end of this module.

Container Nursery

An eight node network was installed at a container operation at a total cost of $11,265.   .
In this case, profits using sensor networks were increased by 146% compared with current practices, so that principal and interest on a 6% loan would be paid off in about 2 months. Details about this system can be found in the article: Lichtenberg et al., 2013 at the end of this module.

For both of these networks however, additional costs, such as the cost of installation, and the cost of commercial hardware and software development were not taken into account.   A commercial control network would likely be about 40% higher in cost, without installation or maintenance. From these two examples, and others from our project, the type and magnitude of savings with sensor network are different for each operation, but we have consistently seen considerable returns on investment.

Majsztrik, J., E. Lichtenberg, and M. Saavoss. 2014. Costs and benefits of wireless sensor networks: How a sensor network might benefit your operation. *In*: Managing Irrigation through Distributed Networks Knowledge Center, M. Chappell, P. Thomas, and J.D. Lea-Cox (Eds.). Published online at: https://myelms.umd.edu/courses/1110342 18p.