Groundwater for Specialty Crop Irrigation

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Prior to beginning a specialty crop enterprise, a source of irrigation water should be established. Property sizes are often too small to justify the construction of a pond to collect surface runoff water. Available options include stream water, hauling water, municipal water and groundwater (subsurface). Most small properties do not have a live stream. Hauling water and municipal water may be cost-prohibitive, except for a greenhouse operation. Another drawback of municipal water is the risk of rationing by regulating bodies during drought periods.

Therefore, the most feasible water source option for small farms is groundwater. A common question from those with land supplied by rural (municipal) water as well as those looking for farmland is, “Who do I contact to determine the availability of groundwater?”

At abandoned homesteads, the presence of a dug well or a well casing protruding from the ground are good indications of the presence of groundwater. Question previous owners and neighboring landowners about groundwater availability. Most have already researched the question.

Another source of information is a local water well driller. In Oklahoma, the Oklahoma Water Resources Board (OWRB) regulates water well drillers. To locate an Oklahoma driller, go to www.owrb.ok.gov/supply/wd/pdf_wd/firms_waterwells.pdf or call 405.530.8800.

Another service offered by OWRB is the online “Reported Water Well Log Viewer,” an interactive tool that allows location of any water well in the OWRB database and provides information about the well including total depth, depth to water and yield. You can access this tool at www.owrb.ok.gov/maps/server/wims.php. If you are less experienced at using the Web, take time to review the tutorial on the site before starting. You can also contact Chris Neel, a water geologist at OWRB, at 405.530.8800. He can walk you through the online process or send you the results of wells in your area. Texas has a similar online, map-based locator for over 800,000 water wells. The “Water Well Report Viewer” by the Texas Commission on Environmental Quality may be accessed at www.tceq.state.tx.us/gis/waterwellview.html.

If you are comfortable reading maps, consider obtaining a copy of the Oklahoma Hydrologic Survey. The survey is published by the Oklahoma Geological Survey in cooperation with the United States Geological Survey. In addition to well depth, depth to water and well yield for recorded wells, the survey provides detailed information on the nature of the water-bearing formation and water quality. Water quality (pH, dissolved salts, sodium content, etc.) is critical when determining the suitability of water for irrigating specialty crops. The survey is composed of six atlases representing different parts of the state; be sure to designate your location when ordering. Printed copies of the atlases can be purchased separately or you can buy the entire survey. To order, visit www ogs.ou.edu/puborderform. php or call 405.325.1299. If you would like to see examples of the atlases, they are available for viewing at the Noble Foundation.

When researching well capacity, keep in mind that the minimum acceptable yield to irrigate 1 acre is 7 gallons per minute. This yield assumes the grower is willing to operate the system up to 20 hours a day during the summer months. A more desirable yield is 14 to 20 gallons per minute per acre, which would significantly reduce daily system run time, reduce wear on the pump (and operator) and allow more time between irrigation
cycles to make needed repairs. The only sure way to determine the yield from a well on your property is to contract with a local driller to drill several test holes. The driller will be able to estimate yield during the drilling process. Following well construction and development, the contractor will test pump it for an extended period to determine yield, static water level (the distance from the ground level to the top of the water in the well) and drawdown (the difference between the static water level and the level of water during pumping).

Most importantly, before investing in a pump and irrigation system, submit a sample of the well water to the Noble Foundation Agricultural Testing Services (www.noble.org/Ag/Testing-Services) or other licensed laboratory for an irrigation water quality analysis. The ideal time for taking a sample is immediately following test pumping. When it comes to irrigation water quality, don’t guess, test! It’s better to be safe than sorry.