Variable Rate Irrigation

January 2006

The VRI Pipeline

News & Updates on
Variable Rate Irrigation
technology from
The University of Georgia
&
Hobbs & Holder, LLC.

Andrea W. Milton & Calvin D. Perry- Editors

In This Issue

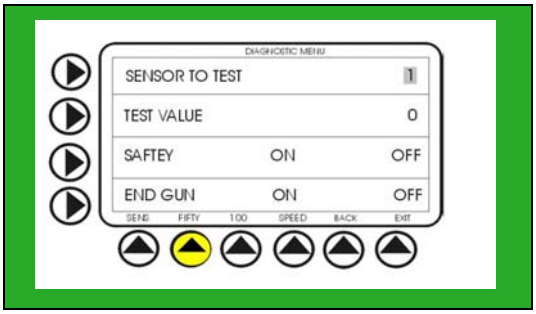
"Winterizing?" What About Those Valves? Air Lines?

by Carl Hobbs
Hobbs & Holder, LLC

Well, Winter is just around the corner and that means harvest of peanuts and cotton are mostly complete and colder temperatures are on the way. This means it's time to "winterize" your pivot's VRI control system.

Some moisture inevitably accumulates above the diaphragm in the top of the VRI control valves that are installed for each sprinkler. To help get rid of some of this moisture, we suggest that you cycle the VRI valves several times with water OFF to the pivot.

How? It's not hard. Walk the pivot dry, turn on the air compressor and the Canlink. Procedures on how to cycle the valves are outlined on page 51 of your Canlink manual, section 4.6.2, under "SENDING 50% AND 100% DUTY CYCLE VALUES TO ALL NODES." Remember that a NODE controls a zone of sprinklers. Go to your Diagnostic screen, and press the arrow below the word "FIFTY" that's at the bottom of the screen (it's highlighted in yellow in the figure below). This will repeatedly cycle the valves ON/OFF in each zone (the manual uses the term "SENSOR".) for 50% of your duty cycle, or 30 seconds out of each 60 second cycle. We suggest leaving it on for about ten minutes so that it runs for a few "cycles".



Fun Fact

Originally, most center pivots were water powered!

After that, turn off both the Canlink blue switch and air compressor. This next step is very important. Drain the water bowl at the filter and let the water filter out. We also advise draining the air tank on the compressor. As always, if you have a question that the manual doesn't answer, please contact Hobbs and Holder.

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The University of Georgia College of Agricultural and Environmental Sciences, Department of Biological and Agricultural Engineering and the National Environmentally Sound Production Agriculture Laboratory (NESPAL)

Title photo by Calvin D. Perry

University of Georgia
PRECISIONAGTEAM

VRI Field Day – A Success Story!

by Andrea W. Milton
Research Professional
Biological & Agricultural Engineering, UGA

The University of Georgia and Hobbs & Holder, LLC hosted a successful field day in Sumter Co on August 23rd to showcase the use of a Variable-Rate Irrigation (VRI) system on the Crisp Farm. The field day was a success with in excess of 30 people attending including landowners/growers, pivot dealers, local businesses, citizen groups, and several media outlets -- Farm Bureau's Georgia Farm Monitor, WALB Channel 10, and WFXL Fox 31. The farms' VRI system was the focus of the day with grower, Ches Goodin, and the landowner, Jenny Crisp, giving their perspectives and speaking on the advantages and ease of using their VRI system. Other speakers included Calvin Perry (UGA), Gary Hawkins (UGA), and Carl Hobbs (Hobbs & Holder), who discussed VRI operations, soil moisture, and installation processes. Using one of customized VRI system maps, the Crisp Farm now has a 15-16% saving in water usage alone!

The University is still looking for center pivot systems within Georgia to cost share with on their NRCS-Conservation Innovation Grant (75% UGA/25% Farmer). If you are interested in having a center pivot assessed for suitability for a VRI system, and in UGA's cost sharing opportunity please contact Andrea Milton (UGA) at (229) 391-6855 or amilton@uga.edu

Jenny Crisp, landowner, discusses the advantages of having a VRI system on her farm.

UGA's Precision Ag Team is grateful for funding assistance for our VRI projects/research provided by USDA, the Georgia Research Alliance, the Georgia Peanut and Cotton Commissions, the National Peanut Board, & Cotton Inc.

VRI
Q&A Help Session
January 24 & 25, 2006
10:30-Noon

Please join us for a
VRI Q & A
Help Session!

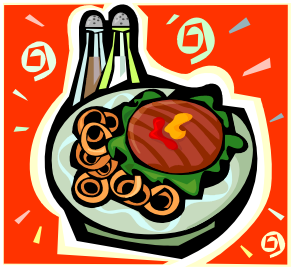
Jan. 24 - Hawkinsville

or

Jan. 25th - Dawson

For directions & more information contact
Andrea Milton
(229) 391-6855
amilton@uga.edu

Lunch will be provided!



Creating Management Zones with Soil EC Data

by Calvin D. Perry
Research & Extension Engineer
Biological & Agricultural Engineering, UGA

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To best utilize Variable-Rate Irrigation (VRI) to manage irrigation water application, management zones need to be established for the field. Management zones have been defined as "regions of a field that have been differentiated from the rest of the field for the purpose of receiving individual management attention." In other words, these zones, for some reason, are areas that you want to manage differently from the other parts of the field.

To delineate zones to better manage irrigation, a grower would likely consider the variability of various attributes of his/her field. These attributes could include topography/elevation, soil type, soil texture, depth to clay layer, field boundary, pivot coverage, non-cropped areas, previous yield history, etc.

Soil texture (% sand/silt/clay) is often a key attribute to consider for irrigation management zones as texture is directly related to soil water holding capacity. However, getting a handle on soil texture all across a field is a difficult proposition. However, we now have a tool available that can make mapping soil texture across a field much easier. The Veris 3100 Soil EC sensor pulls behind a pickup truck or small tractor and measures soil electrical conductivity (EC) over two depths, 0-30 cm and 0-90 cm. In soils found in the Southeast, EC data provides a good representation of soil texture - the lower the EC value, the greater the sand content; the higher the EC value, the higher the clay content.

Once the EC data is obtained, maps showing the data across an entire field can be created. Once the maps have been created, management zones can be delineating by visually observing areas in the field with approximately the same level of EC values. Figure 1 shows 0-90 cm EC data from a field in south Georgia with the zones drawn in to indicate areas of similar values. The lighter tan colors indicate more sandy soils while the darker brown regions indicate a higher clay content. These zones can now be used to develop irrigation application maps in the Farmscan software.

One word of caution - the created zones should be large enough to allow the VRI system to properly manage the water application while the pivot crosses over the particular management zone(s). Despite the wealth of data it can provide, the Veris 3100 is likely too expensive for all but the largest growers to own individually. Consultants and some cooperatives are considering offering Veris EC mapping as a service to their clients on a cost per acre fee. Plus, unlike yield or disease, soil texture isn't likely to change much from year to year, so a grower can have a Veris EC sensor run over their field and not have to repeat this measurement, possibly ever again.

The University of Georgia Precision Ag Team has a Veris 3100 system and is using it to map soil EC in fields where our Conservation Innovation Grant is cost-sharing installation of VRI systems.

Figure 1. Soil EC Data from Veris 3100 with management zones delineated in orange

A team headed by Calvin Perry has been invited to submit a final proposal to the National Peanut Board through the Southeastern Peanut Research Initiative for funding of a project dealing with VRI. The project, "Maintaining Optimal Soil Moisture in Peanuts with Variable Rate Irrigation", has as its objectives a) determine if VRI controls can truly enable a center pivot to maintain optimal soil moisture for peanut production; and b) determine if, by maintaining optimal soil moisture, peanut yield and quality will be significantly enhanced. If the project is funded, the team will be selecting a field with a VRI-equipped pivot that will have peanuts planted in 2006. They will identify soil zones and install soil moisture monitoring sensors that will be monitored throughout the growing season.