

ROOTS, RATS AND RELICS: A SERIES OF DISCOVERIES MADE POSSIBLE BY THE UTILIZATION OF THE DOWN WELL CAMERA BY GEORGIA COOPERATIVE EXTENSION

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Abstract. Homeowners purchase property not associated with public drinking water systems. These individuals are unaware of their responsibilities as private well owners and are unfamiliar with proper well construction and maintenance requirements. Most become inspired to take action only after apparent water quality problems arise.

The development of various diagnostic techniques involving the use of the down well camera as a detection tool by Cooperative Extension Specialists and Agents in Georgia has produced dramatic results. Routine well camera use has documented various vertebrate and invertebrate pests associated with private drinking water wells as well as the intrusion of roots of various botanical origins. Debris sources not commonly thought to be associated with drinking water wells have also been documented. This presentation will illuminate these varied contaminants.

OBJECTIVES

The education of the public concerning the vulnerability of drinking water wells and water quality are of the utmost importance. Most homeowners are unaware of issues surrounding proper maintenance and up keep of wells including covers, grouting and seals.

Due to heightened awareness of ground water issues and persistent problems such as elevated bacteria levels, odor, turbidity and well failure demand that additional resources be brought into play when other options are exhausted. Due to the blind nature of down well diagnostics, methodology must be developed to give a satisfactory view of the inner workings of a drinking water well.

METHODS

A pilot program was developed by the University of Georgia Agricultural and Environmental Service Laboratories utilizing a Well View down well camera and video recording equipment to shed light on problematic drinking water wells. Subsequent discoveries and a large number of requests for assistance with problematic wells by private well owners prompted the need for more down well cameras and Extension Agent training in their correct use.

Grants were explored successfully to provide funding for the acquisition of one camera and necessary support equipment for each of the four Georgia Extension districts. Agent trainings were carried out in each district to familiarize agents with operation of the down well camera and recording equipment, as well as on site water well diagnostics and the required preparations necessary for use of the well camera.

CONCLUSIONS

Discoveries from the use of the down well camera have shown that water quality issues are more prevalent in shallow bored wells than in drilled deep wells. Discoveries show that contamination issues are not confined to naturally occurring phenomena such as root intrusion or faulty sub-surface geology. Lack of understanding of proper drinking water well construction and improper maintenance by the well owner has proved to facilitate most instances of contamination. Improper installation of well casing, seals, grouting and above ground pumps by the water well contractor has played a lesser, yet still significant role in facilitating both biotic and a biotic contamination. Mistakes on the part of the well drilling contractor and neglect of maintenance by the well owner have resulted in biotic contamination in the form of rodents, reptiles, amphibians, arthropods and insects. Certain microbiological contamination can also be attributed to neglectful maintenance and installation errors.

Accidental introduction has also played an important role in well contamination. Introduction of refuse, cell phones, household appliances and tools have resulted from inexperienced, misguided attempts at maintenance by the well owner. Chemical introductions have also resulted from motor fuels, lubricating oils and pesticide products stored adjacent to drinking water wells or inside well houses or covers.

REFERENCE

Fielder, J.K., 2005, A Georgia County Agent's Perspective: Delivering an Effective County Program to Private Well Owners, Proceedings of the 2005 Georgia Water Resources Conference.

Example 3: New isopod species from bored well



Example 4: Slug on bottom of bored well



Example 1: Rat at bottom of shallow bored well



Example 2: Rat floating on surface



Example 5: Cell phone, car keys and mouse on bottom of bored well



Example 6: Refuse on bottom of bored well



Example 7: Pine roots intruding into drilled deep well