

INCORPORATING UNMANNED AIRCRAFT IMAGING WITH GROUND-PENETRATING RADAR FOR EFFICIENT MAPPING OF AGRICULTURAL DRAINAGE TILE SYSTEMS

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A mapping protocol utilizing GPR as a ground-truth technology was developed to survey large-acreage tracts of buried agricultural drain tiles. We surveyed two field sites having buried tile networks in central Ohio, USA, using unmanned aircraft systems (UAS). The UAS carried conventional high-resolution color visual (VIS), near infrared (NIR), and thermal infrared (TIR) cameras.

Our surveys showed that remote sensing has the potential for rapidly mapping large tracts of agricultural drainage tile networks. Under wet field conditions, VIS (for exposed soil) and NIR (for crop canopy vigor) technologies are applicable as surface drainage patterns are visible. Under dry field conditions, TIR detected roughly 60% of the subsurface drainage infrastructure known to be present.