

Advanced Data Collection System for Agriculture

ID: 2025-005

Executive Statement:

A cutting-edge solution for improving agricultural data collection through signal-direction-finding and high-gain receivers.

Technology Overview:

This technology provides a comprehensive approach to enhance data collection in agricultural systems by utilizing advanced signal-direction-finding and high-gain receivers mounted on irrigation equipment. It employs low-cost, wireless "Smart Stakes" for soil monitoring, which communicate data to these receivers, allowing for the spatial localization of RF sources, mapping of vegetation properties, and secure in-field communication. The system leverages computed tomography analysis to generate detailed vegetation maps, aiding in precise farming decisions.

Key Advantages:

- Enhanced spatial localization of RF sources within agricultural fields
- Detailed mapping of above-ground vegetation properties
- Secure communication through geofencing, minimizing data spoofing risks
- Utilization of low-cost, wireless soil sensors for below-ground data collection
- Integration with existing agricultural infrastructure to reduce costs and interference

Problems Addressed:

- Improves precision in agricultural monitoring and resource use
- Reduces costs by integrating with existing infrastructure
- Minimizes the risk of data interception and spoofing
- Provides comprehensive above and below-ground data collection

Market Applications:

- Precision agriculture and crop management systems
- Water resource management in farming
- Agricultural equipment and sensor manufacturers
- Secure agricultural data communication networks