DAGAN, INC.

Leading edge science-based data services for soil health

• Established in 2018, as a spin-out from Applied GeoSolutions
• Williams Salas, Stephen Hagen, and Ian Cooke - Founders
• Located outside of Boston in Durham, NH
• Seed investment from Neglected Climate Opportunities in 2019

Contact: wsalas@daganinc.com
DAGAN MISSION AND VISION

Dagan is a new soil health and agricultural ecosystem services company, working to be the leader in providing soil health and regenerative agriculture data insights to organizations who bank on farmers.

Our mission is to make resilient agriculture ubiquitous...for soil health outcomes, thriving people, communities, and the environment.

Priorities in resilient land management:

• Soil health
• Soil carbon
• GHG
• Soil moisture
• Productivity, food security and livelihoods
Dagan Core Data Services:

- **Biogeochemical Model**
  - DNDC

**Environmental Outcomes**
- Soil Carbon
- Greenhouse gas emissions (N$_2$O, SOC, GWP)
- Nutrient Use Efficacy
- Water Use Efficiency
- Reactive Nitrogen
- Yield
- Ecosystem service markets

- **Operational Tillage Information System**
  - OPTIS

**Row and Grain Crop Management History**
- Field Boundaries based on management history
- Crop History
- Tillage Practices
- Cover Crop
- Days of green/senescent cover
- Crop Emergence Date

- **Remote Sensing-based Grazing Land Monitoring**
  - RDSS

**Grazing Land Conditions & Management History**
- Vegetation productivity and cover history
- Identification of management vs. natural effects of condition changes
- Grazing intensity estimates

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Dagan AgTech for Monitoring, Verifying and Quantifying Soil Health

**Connecting Satellites to Soil Microbes: Tracking Regenerative Ag at Field to Watershed Scales**

**Principles of Soil Health Management:**
- Crop rotations
- Minimal Soil Disturbance
- Continual living roots
- Soil cover (residue)
- Livestock integration

**Benefits of Healthy Soils:**
- Increased soil organic matter
- Better drought and flood resilience
- Better nutrient cycling
- Microbial diversity
- Reduced pest and weed pressures
Tracking Soil Health Practices and Outcomes...

1. Field-level ag management data...
   - Cover Crops 2017-18
   - Residue Cover 2017-18
   - Red – vigorous cover
   - Green – winter kill cover
   
2. Input to DNDC to model outcomes...
   - Soils
   - Weather
   - Management
     - Grower
     - OpTIS
     - Surveys
   
3. Summarized at the county, watershed, grainshed
   - SOC
   - N2O
   - CH4
   - GWP
   - Nitrate leaching
   
4. Setting baselines for Ecosystem Services Markets
   - SOC - Conservation tillage and cover cropping result in additional accumulation of C in the soil.
   
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...to provide detailed information at scale

Technology applied to 1.9 m fields across the corn belt...annually from 2005 to 2018

The Nature Conservancy, the Foundation for Food and Agriculture Research, The Walton Family Foundation, Syngenta, The Mosaic Company, Bayer Crop Science, the J.R. Simplot Company, Corteva Agriscience, Enterprise Rent-A-Car, the Walmart Foundation, and the US Department of Agriculture provided funding and support for this project.

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Dagan Tech to Reduce SOC Market Barriers

Ecosystem service markets: Challenge: High transaction costs for setting baselines, quantifying ecosystem services outcomes and verification. Dagan Solutions:
- Satellite monitoring of agricultural practices – low cost verification, can go back in time
- Extensive cal/val of DNDC model for quantification of uncertainty
- DNDC MRV linkage via API

Supply Chain Reporting and Insetting: Challenge: Need for transparency, lack of Identity Preservation, need for consistency in reporting and rigorous accounting. Dagan Solutions:
- Satellite monitoring of low carbon agricultural practices at multiple scales (field, supply sheds, jurisdictions), setting baseline for tracking incremental improvement, and quantifying net benefits

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