



Soil Health, N Fixation, Carbon Sequestration:

Adding Value to Agriculture

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Louisiana Agricultural Consultants Association

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Agenda

- Introduction
- The soil health opportunity as the next frontier: a market opportunity for American farmers
- SIMPAS / Ultimus as one viable solution
- Industry's role in the shifting landscape
- Key takeaways



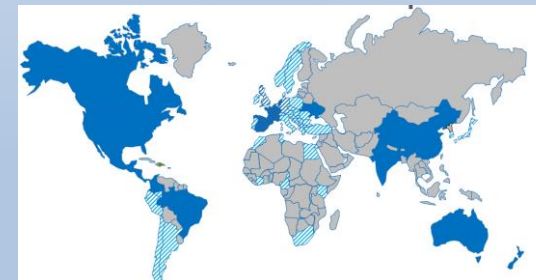
Bob Trogele

- COO and EVP of AMVAC
- Career in Agribusiness working for “large caps” such as Hoechst, Aventis and Bayer, and “mid-caps” such as Schering and FMC
- Adjunct Professor at the Berlin School of Economics & Law
- Independent board director of Clean Seeds Capital Group and the Farm Journal Foundation
- Board member of the Agricultural Retailer Association



This Is AMVAC

- Celebrated 50 years in 2019
- Subsidiary of American Vanguard Corporation
- NYSE: AVD
- >\$550 Million Annual Net Sales
- 21 global subsidiaries and 9 operating companies representing all major ag markets
- Full portfolio of crop protection and biological products
- ***Technologies Solution Provider:*** Leader in proven chemistries, precision application systems, and bio-solutions



About American Vanguard

American Vanguard Corporation is a diversified specialty and agricultural products company that develops and markets products for crop protection and management, turf and ornamentals management and public and animal health. American Vanguard is included on the Russell 2000® and Russell 3000® Indexes and the S&P SmallCap 600® Index. To learn more about American Vanguard, please reference the Company's website at www.American-Vanguard.com.

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Why Carbon Is Relevant to U.S. Agriculture



Why Carbon Is Relevant to U.S. Agriculture

Farmer:

Incremental income

Sustainable soil
health

Equity value
increase

Compliance:
regulatory, food cos.
PR



Consultant / Retailer:

Incremental income

Value-added agronomy:
prescription

Added-value soil health
solutions

ARA Sustainability
Initiative & Carbon
Working Group

Channel
Micro
Interests

A pair of hands is shown from the wrists up, cupped together and holding a mound of dark, rich, moist soil. The hands are positioned in the lower-left quadrant of the frame. The background is a vast, textured expanse of similar dark soil, filling the rest of the image. The lighting is soft and even, highlighting the texture of the soil and the skin of the hands.

Soil health is the next largest
market opportunity for
American farming since
biofuels

The soil health opportunity expands from “*pest control and nutritional supplement*” to “*long-term microbial wellbeing and replenishment*”

ROW CROP CARBON SEQUESTRATION OPPORTUNITY

\$20/acre X 180 Million Acres =
\$3.6 Billion

\$50/acre X 180 Million Acres =
\$9 Billion

\$100/acre X 180 Million Acre =
\$18 Billion

NITROGEN FIXATION MARKET: 15%-20% REDUCTION IN NITRATES

Annual North America Nitrogen Market:
\$27.35 Billion¹

20% Reduction = \$5.5B

Land on balance sheet is by far the
largest asset

How Big Is the Carbon Market?

Grew 23% last year to \$281 billion ¹

Could be worth \$22 trillion by 2050

Carbon makes up about 5% to 10% of BP's trading activities

How Big Will the Carbon Market Be?

“By our estimates, a third of the carbon credits the world will need in the next several years could come from farming – creating a market that we expect to grow to \$100 billion within the next decade.”¹

– Chuck Magro, then-President/CEO, Nutrien (now CEO, Corteva Agriscience)

The Opportunity

- **Carbon** and **Soil Health** are going to be a game-changer
- Partnerships will be critical
 - Public / private sector joint effort
- Macro trend isn't going away in ag: opportunity in carbon
- Practices that increase soil carbon sequestration can **transform agriculture into a large carbon sink** with a technical potential estimated offset of 1/4 to 1/3 of global emissions annually
- The growing demand for carbon dioxide removal solutions and the value of carbon credits in the years ahead will have a fundamental and lasting impact on the economics of the agricultural sector, with offset markets expected to reach \$200B by 2050¹.
- ***AMVAC and SIMPAS as a partner . . .***

SIMPAS: Soil Health, Precision Ag, Green Solutions

Prescriptive Application



Closed delivery system for prescriptive application of in-furrow products (dry and/or liquid), at-planting

Crop Inputs

SIMPAS-applied Solutions:
Insecticides,
nematicides,
micronutrients,
biologicals; RFID-tagged containers



**Sell to Carbon
Markets:
THE
OPPORTUNITY!**

Data Management

ULTIMUS[™]

Ultimus[™]
Technology
Platform: measure,
validate, report
(MVRA)

SIMPAS-supplied Solutions (SAS)

Current



Launching 2022

iNvigorate[®]

MicroSync IronClad IDC
micronutrient

*More Products and
Crops to Come . . .*

Green Solutions (i.e., Biostimulants): Key Success Factors

- Financial stability to register and develop solutions
- Ability to manufacture consistently
- Ability to package and transport
- Fresh delivery and concentration of microbes
- Access to the farm agronomist
- Used as part of a total integrated pest management (IPM) program
- Consistent yield benefit and efficacy



B Sure®

ECOZIN®
PLUS

iNvigorate®

UpLift®

SIMPAS Partnerships

Application Equipment



SIMPAS-applied Solutions



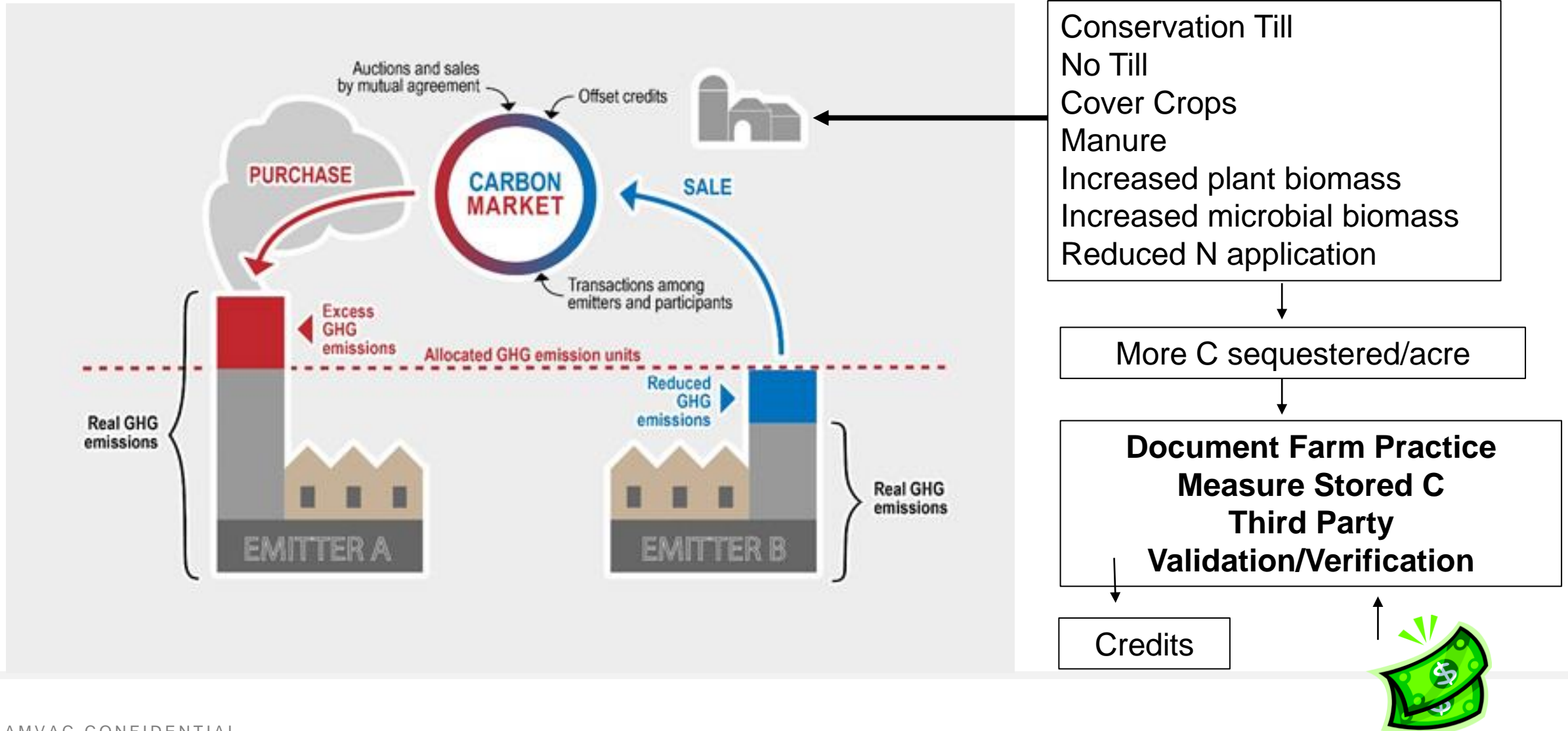
*Many more
partnerships
to come!*

ULTIMUS[™] – patented technology platform that integrates:

- RFID *-tagged ag product containers
- Traceability software
- Customer accounting software
- Application equipment
- Precision ag/geospatial equipment
- Blockchain-enabled for forensic accounting purposes



The Carbon Credit Market

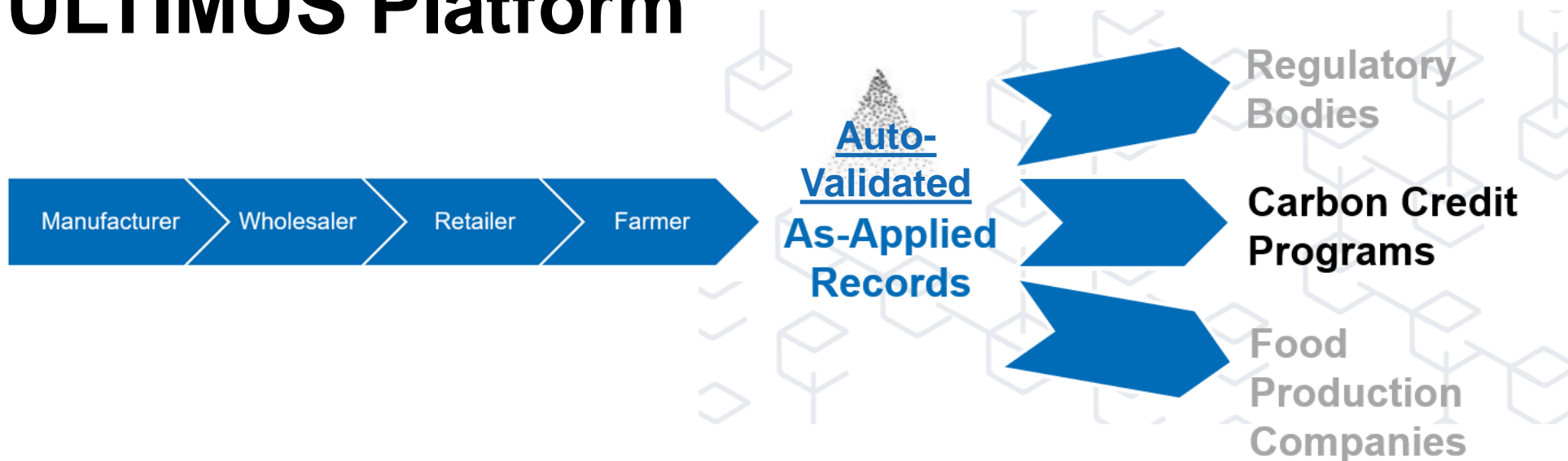


Biggest Challenges

1) MVRA: Measure,
Validate, Record, Audit

2) Reducing administrative
resource requirements

ULTIMUS Platform



How Do Consultants / Farmers Play?

- **Precision mapping and precision prescriptions?**
 - Big opportunity to be paid for these services
- **Data management and analytics:** Who owns the data? Who uses the data?
- **Government incentives** – tax incentives and direct payments
 - Public – private partnerships
 - Research by grant universities
 - Credibility: MVR and the ability to audit
- **New microbial soil testing technology**
- **Increasing the long-term value of the farm / land / soil**
- **Capability to leverage ...**
 - Authorized filling stations
 - Custom application business
 - Inventory management

Key Takeaways

- The opportunity is here – and real
- Technology exists to make it happen
- Timing is good to invest in technology
- Who are your key partners?
- Be prepared for rapid and important change
- Not participating is risky!



Thank you for your support and attendance!

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