Food  We love it, need it — and often take it for granted. The same is true for the water we drink and the air we breathe. These vital resources are all interconnected — to each other and to us.

Confirmed by science from every corner of the globe, many of our resources are being consumed at an accelerated rate to keep up with the demands of a population that continues to grow. While we have capitalized on agricultural technology and production practices to boost food production, our management of resources has suffered. But as knowledge increases and practices improve, we are adopting long-term management strategies that will sustain and even enrich food production, protect water and clean the air.

There are no simple approaches to this challenge. The path forward is often complex, balancing the benefits to one part of the system against the needs of others. Sustainable resource management requires addressing the needs of all parts of the eco-system: air, water, land, and the myriad animal, plant, and microbial lives that interact with these systems and with each other. Interventions to help one segment impact other areas.

We require a new, more holistic approach to managing sustainability. The next level looks beyond simply weighing priorities against each other. It envisions and incorporates innovative technologies that can create real benefits for sustainable outcomes.

One such approach is the use of novel technology from Anuvia to upcycle organic materials into plant nutrient products that work with the ecosystem, to maximize agriculture production now and for the long term. The future of fertilizer has arrived.

**Pandemic Raises Consumer Interest in Sustainability**

As of April 10, 2020, 83 percent of consumers took the environment into consideration when making consumer goods purchases.

That’s up 12% since last year, and shows that sustainability has grown in importance in the minds of consumers.

*Farm Journal-AGPRO, July 24, 2020, Steve Cubbage*

This spike in interest about food sustainability was heightened by the fact that many people “got closer” to their food. Millions during this “time at home” became the head chef, short order cook and main hunter and gatherer of provisions. They got to “choose” the food instead of farming out that task. Empty shelves and fewer choices brought home the realization of how important agriculture is.
It’s not every day that a company develops a new product that offers long-term impact — not only for its customers, but for their communities and future generations. Anuvia’s plant nutrient products can make a real difference in meeting the challenges faced by farmers, the agricultural industry and the planet to feed more people, more sustainably. It’s not a small task.

That’s why Anuvia is working diligently with farmers and industry alliances to reimagine the future of fertilizer — one that is more efficient, more effective, and more sustainable. By applying today’s technology to the age-old practice of farming, we can create an abundant food supply for future generations, while responsibly managing the world’s limited soil, air and water resources.

Our plant nutrients can make an immediate impact. Anuvia’s bio-based technology delivers three essential components for agricultural success: it improves soil health; it increases yield; and it makes sense environmentally. Independent research and on-farm performance prove it’s a sustainable technology that doesn’t take decades to achieve positive change. Few companies can make that claim.

Scientists, farmers and consumers alike all agree that food security and a sustainable future means growing more on available land and making less impact on natural resources. In fact, at Anuvia we go a step further by developing products that work to improve the environment. Anuvia, its stakeholders and the customers we serve, all want the same outcome for the beautiful world we share — an abundant and sustainable tomorrow.

Anuvia can meet the challenge.

Amy Yoder
Chief Executive Officer
Organic materials can be repurposed in several ways, but no conventional method can compare to Anuvia’s technology. Our innovative process provides a unique solution that helps farmers to produce more food through increased crop yields and turf professionals to grow healthier turf, all while responding to a wide range of environmental challenges.

As a society, we’re moving away from the linear, single-use, disposable mentality of the past. By turning what was once deemed useless into something useful, Anuvia represents the missing link in completing the “circular economy.” Anuvia is delivering / offering new solutions for growers, turf mangers and homeowners who want performance they can feel good about.

At Anuvia, we make products that utilize resources most would otherwise dispose of, and we do it in a way that supports the three pillars of sustainability:

- **Environmental**
- **Social**
- **Economic**

We represent the future of fertilizer. We deliver innovative ag technology with the potential to significantly reduce the environmental impact of farming. Feeding millions. Preserving land for future generations.

It takes more than just great technology to change the world. You also need a dedicated team with the experience and vision to make it happen. Anuvia’s innovative solutions are born from decades of hands-on agricultural experience in the field. Our team’s collective insight allows Anuvia technology to seamlessly work with current agricultural processes, protocols, and equipment. Working together, we can make sustainability profitable for operations of any size.

Anuvia is well-versed and experienced in organic resource processing, granular plant nutrient manufacturing and marketing, project development and finance and much more. From small farms to scalable innovations for the industry’s biggest players, our team has the critical expertise to grow sustainable success.

**Food Facts**

To provide for a population projected to reach 9.3 billion in 2050 and support changing dietary patterns, estimates are that food production will need to increase from the current 8.4 billion tons to almost 13.5 billion metric tons a year. Achieving that level of production from an already seriously depleted natural resource base will be impossible without changes in our food and agriculture systems.

Source: [http://www.fao.org/3/a-i3940e.pdf](http://www.fao.org/3/a-i3940e.pdf)
Anuvia scientists, concerned with protecting and managing resources, identified organic waste as a social and economic problem.

Scientists determined that reclaiming, reusing and converting organic materials such as from peanut hulls, food waste or manures into a high efficiency plant nutrient could represent a better way to return nutrients and organic matter to the soil.

Breakthrough technology opens a door to sustainability. The Organic MaTRX™ technology works in large scale production and becomes a technological breakthrough in the fertilizer industry.

Zellwood, Fla. manufacturing facility produces first biobased nutrient products as proof of concept. The facility represents the first of its kind in the world, establishing a new standard in plant nutrient manufacturing and re-use of organic materials.

Anuvia receives USDA certification for 87% bio-based products.

First commercial availability of Anuvia’s new product line hits the market: SymTRX™ for agriculture, GreenTRX for turf and professional lawn care.

University and private research trials prove significant yield increases across multiple crops.

ANUGREEN for residential lawn care enters consumer market.

In-depth, rigorous exercise assesses carbon footprint through every phase of the product lifecycle, including sourcing materials, manufacturing and field use.

Significant environmental benefits confirmed by leading environmental research firm.

With a long-term lease agreement and an additional $50 million investment, Anuvia repurposes a portion of the Mosaic Company’s former phosphate production plant and takes a giant step forward as it brings its technology to the broader agriculture markets and re-locates at a new manufacturing facility in Plant City, Fla.

Production capacity ramps up to 1.2 million tons.

Increased Production to Meet Supply Demands
Chosen because of its easy access to direct transportation routes that are essential to serve the large agricultural markets, Anuvia’s new Plant City production facility is close to rail and truck routes, and has easy access to ocean and water transportation, enabling us to supply and serve all the major markets in the United States.

Why the Organic MaTRX is a Breakthrough Technology
The Organic MaTRX works by combining electrostatically charged (positive and negative) organic particles that provide docking sites for desired nutrients. These substances come in the forms of ions like ammonium (NH₄⁺), sulfate (SO₄²⁻), phosphate (P₂O₅), and ferrous iron (Fe²⁺).

This unique delivery system is different from other slow release products, and in fact mimics nature. In nature, plants easily absorb nutrients from the soil. The Organic MaTRX allow nutrients to quickly, then slowly release and efficiently become available to the growing crop.

Anuvia’s products simultaneously feed crops and the soil for increased yields and healthier soils – all the while helping plants use nutrients more efficiently with less of the nutrition lost to leaching or volatilization.
ENVIRONMENTAL SUSTAINABILITY
Agriculture is not about optimizing only one piece of the puzzle, but understanding that we have to consider how to manage our basic resources—air, water, and soil.

New sustainable technology can increase the capacity of our basic natural resources to allow for the maximum return from our genetic resources and management inputs. The need to increase food and feed will require that we focus on all components of the agronomic system.

Unless consistent action is taken to lessen the impact of unsustainable land management and improve air, water, and soil health, agriculture and society may reach a point where technology advances will not sufficiently mitigate the impacts of a reduced topsoil depth coupled with a more variable climate.

Anuvia’s plant nutrient products can help mitigate the many challenges agriculture faces to protect our planet’s natural resources and regenerate soils while improving air and water quality for a more sustainable future.

**Air Quality: A Visible Difference**

Consider the importance of reducing GHGs, which impact air quality. Greenhouse gases are produced when nutrients in traditional fertilizer are lost as gas or vapor into the atmosphere, largely in the form of NO₃ and CO₂.

*According to the EPA, agriculture accounts for nearly 10% of all greenhouse gas emissions in the United States.*

The good news is that GHG from agriculture can decline by adopting sustainable farming practices such as Anuvia’s technology.

While traditional fertilizers volatilize more readily into the atmosphere, Anuvia’s nutrients stay bound in the soil to feed the microbiome, help build organic matter and retain soil carbon.

*For every million acres of crops that use Anuvia products, the reduction of greenhouse gases is the equivalent of removing 20,000 to 30,000 cars from the roads. With 90 million acres of corn in the United States alone, this would conservatively translate to 1.8 million cars removed in perpetuity.*

**Water Quality: A River Runs Through It**

More than $450 billion in food, fiber, manufactured goods and tourism depend upon healthy water quality (*The Nature Conservancy*). With about 40 percent of U.S. land used for agriculture, advanced nutrient management is crucial to protect our rivers that are used not only for cropland irrigation and recreation, but also for commercial transport of grain to vital shipping ports such as the Gulf of Mexico.

Reducing fertilizer leaching makes a huge difference in the health of our nation’s watersheds. No matter where you live—your home, community or farm is located in a watershed. Water dripping from a window, pooling in a field or going into a wastewater treatment facility—it all flows into a watershed fed by a stream, lake or wetland that’s headed into a river or the ocean.

The interconnectivity of watersheds underscores the importance of fertilizer management. When pollutants caused by soil erosion and fertilizer leaching enter water sources, it interferes with the natural balance of a watershed.

**Prove it: Reduced Nutrient Loss Reduced GHG**

Anuvia’s innovative technology efficiently delivers nutrients to growing plants. Because these high-efficiency nutrients are in plant-unusable form, more nutrients are actually used—less are lost through volatilization or leaching. Independent research has confirmed these sustainable and environmentally-friendly benefits.

To evaluate nutrient loss via leaching, the University of Georgia conducted a research trial to determine nutrient loss of Anuvia products compared to conventional inorganic fertilizers. The study confirmed a 50.2 percent reduction in nitrogen leaching compared to urea and a 39.9 percent reduction compared to ammonium sulfate.

Environmental Resources Management (ERM), a leading global environmental consulting firm, verified the sustainability impact of Anuvia’s technology on corn, rice and cotton. The study found that Anuvia’s plant-nutrient technology reduces greenhouse gases (GHGs) on a crop production acre by up to 32% compared to conventional fertilizers, while at the same time increasing farmers’ profitability.

**Highlights of the ERM study**

- 10% reduction of greenhouse gases on corn
- 32% reduction of greenhouse gases on cotton and rice
- 4X to 13X lower carbon footprint (compared to conventional fertilizer products) from manufacturing process
A critical function of soil is to grow food-producing plants. It’s estimated that more than 95% of human food is produced in soil. Our food production system depends upon healthy soils to supply vital nutrients, while recycling water and air to keep plants flourishing. In turn, these plants supply the ingredients needed to feed animals and people.

Soil loss not only affects vital resources, it also impacts yields. Soil health practices are critical for a sustainable and profitable agriculture. As soils degrade through intense weather events and intensive farming practices, soil organic matter decreases, and carbon is lost: through CO₂ greenhouse gases into the air; erosion into streams, rivers and lakes; and leaching. In the U.S., soil degradation can reduce yields by 50% (United Nations Food and Agriculture Organization).

Land degradation, biodiversity loss and climate shifts have made soil one of the most vulnerable resources on the planet. Soil is the primary reservoir of biodiversity in the world and stores more carbon for plant, food, fiber and human life than any other resource. Soil health is vital to the ecological services required by humankind. (Jerry Hatfield, Director USDA National Laboratory for Agriculture and the Environment and Plant Physiologist, Ames, IA, retired)

The Economic Value: Farming’s Priority

At its core, the economics of sustainability rely on advanced nutrient management. Anuvia’s plant nutrients help farmers improve soil health and profits. Four years of farm-scale use on more than one million acres, along with university and private research trials, provide the proof.

With an average yield increase of 5.1% across major row crops such as corn, rice, wheat, canola and cotton (when used in a blend replacing a conventional nitrogen or sulfur fertilizer), farmers using Anuvia bio-based nutrients will see a 3x to 5x return on investment.

Carbon and Soil Health Go Hand in Hand

To understand how carbon sequestration plays into soil health, first it’s important to realize that carbon is only one component of soil health. Improving soil health and building soil carbon is not the result of a single change in management. Rather, it is a complex puzzle that links the soil, weather, crop, and management into a series of interrelated connections. These connections will vary by soil, climate, and cropping system.

Anuvia products provide a clean efficient food source for microbes in the form of amino acids and peptides. Microbes use amino acids as a source of food to grow and multiply.

University of Georgia trials document the sustainable performance benefits. A soil health assessment showed a 248.6% increase in soil microbial activity for more rapid-microbial recolonization compared to a conventional product such as ammonium sulfate. A root mass increase of 27% with Anuvia compared to ammonium sulfate is also documented in the University research.
SOCIAL SUSTAINABILITY
A circular economy approach incorporates 360 degrees of production, from raw materials, to energy use, to shipping and packaging, to the impact of the final product. It’s all connected.

Anuvia sets a precedent in effective re-use of organic materials. An enormously important aspect to Anuvia’s technology and brands is the composition of these products and the process used in manufacturing. These products are made by reclaiming organic materials in the last step of their lifecycle and repurposing them. This process eliminates waste and re-uses resources. This approach is a real-life example of a circular economy in which resources are reclaimed, converted and then reused. Reclaiming organic materials at the end of the food chain, while not totally ignored by other industries, has not been available as an effective and practical solution — until now.

Anuvia took a giant step forward as it re-located to a new manufacturing facility in Plant City, Fla. Here the company will increase production capacity up to 1.2 million tons. While much of the existing infrastructure was used, including production lines, warehousing, shipping and office facilities, extensive modifications were made to accommodate Anuvia’s unique production processes.

This production facility is a one-of-a-kind, state-of-the-art plant. Its manufacturing forms a closed loop in which no waste stream is created — only clean air and finished product. For every ton of organic material used, approximately a ton of fertilizer is produced. The facility will not only positively impact the fertilizer industry, but it will also benefit the area by establishing another clean manufacturing site that contributes to the community and the state.

Anuvia’s customers benefit not only from access to high-performance plant nutrients, but also from the knowledge that they are contributing to the upcycling of resources that would have gone to landfills.

Nutrient Recycling and Phosphate
A product utilizing Smithfield swine remnant waste would efficiently return plant-useable phosphorus back to the land.

Shared Vision
Anuvia and other companies are aligning to create synergies in efforts to produce, protect and preserve.

Building Alliances to Bring Sustainable Solutions to Farm Scale
Forward thinking created Anuvia’s fresh approach to bringing novel, sustainable plant nutrients to the fertilizer industry. To make rapid progress, Anuvia also seeks to participate in and build alliances among convergent and synergistic organizations.

Collaboration among other like-minded industry leaders is essential in attaining sustainability goals locally and globally. These partnerships sometimes result in an alliance of uncommon bedfellows — all working toward the same goal to make an even greater impact.

Anuvia supports a wide range of programs and organizations that focus on agricultural sustainability and profitability, including:

- **American Farmland Trust.** AFT takes a holistic approach to farmland and ranchland, protecting it from development, promoting environmentally sound farming practices, and keeping farmers on it. [https://farmland.org/](https://farmland.org/)
- **Ecosystem Services Market Consortium.** ESMC is developing a national scale ecosystem services market to sell carbon and water quality/quantity credits for the agriculture sector. [https://ecosystemservicesmarket.org/](https://ecosystemservicesmarket.org/)
- **The Fertilizer Institute.** TFI is a lead partner in 4R Farming, which works with farmers to increase production and profitability, enhance environmental protection, and improve sustainability. [https://www.4rfarming.org/](https://www.4rfarming.org/)
- **Field to Market.** Working to create productive and profitable opportunities across the agricultural value chain for continuous improvements in environmental outcomes. [https://fieldtomarket.org/](https://fieldtomarket.org/)
- **Iowa Agriculture Water Alliance.** IAWA drives the adoption of conservation practices and other innovations to improve water quality. [https://www.iowaagwateralliance.com/](https://www.iowaagwateralliance.com/)

Pivotal Position
Within the agricultural industry, opportunities for organizations to come together to further sustainability goals abound. Repurposing agriculture organics is central to Anuvia’s vision of returning agricultural by-products back to the land — a strategy that clearly exemplifies a circular economy. To produce bio-based plant nutrients, Anuvia can use organic materials from a variety of crop by-products such as peanuts hulls, livestock waste, food waste, mash from breweries or many others. The possibilities are abundant and the implications far-reaching.

Essential to meeting sustainability goals is the development of partnerships with companies, such as ongoing work with Smithfield Foods, where Anuvia reuses organic material in hog manure to create plant nutrient products that recycle the manure organics and its nutrition back to the farm. Imagine the impact these types of partnerships can have on sustainability goals throughout the food chain.
With little to no financial or operational barriers to adoption by its customers, Anuvia’s products are poised to make an instant impact on farming, helping those who tend our soils drastically reduce their environmental footprint while more efficiently nourishing their crops, growing healthier, higher yielding crops on the same acreage and, ultimately, ensuring productivity for future generations.

In a world where natural resources are finite, it’s the kind of environmentally responsible, sustainable technology that also makes good business sense.