VERTICAL EXPLORATION INC.

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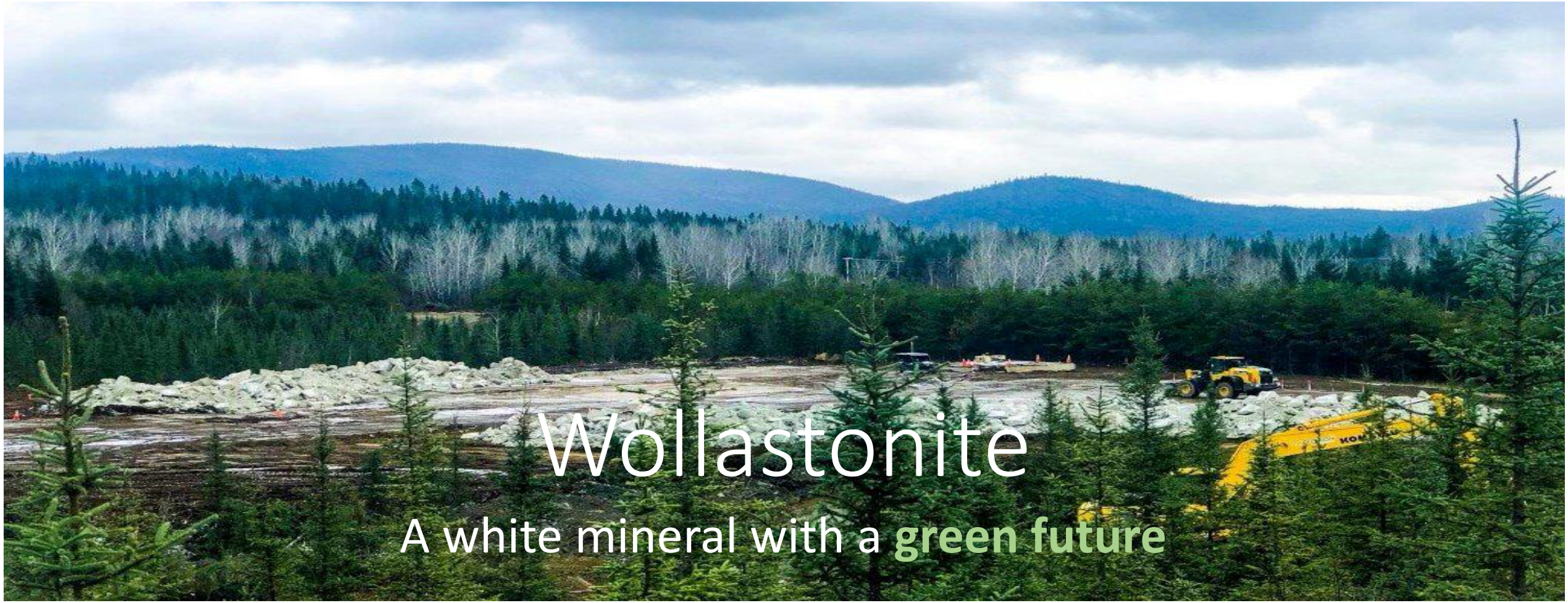


Wollastonite

A white mineral with a **green future**

Corporate Presentation: November 2022

Disclaimer & Forward Looking Statements

Cautionary Statement on Forward-Looking Information & Statements: This presentation contains certain forward-looking information and statements which may not be based on fact, including without limitation, statements regarding the Company's expectations in respect of its future financial position, business strategy, future exploration and production, mineral resource potential, exploration drilling, permitting, access to capital, events or developments that the Company expects to take place in the future.

All statements, other than statements of historical facts, are forward-looking information and statements. The words "believe", "expect", "anticipate", "contemplate", "target", "plan", "intends", "continue", "budget", "estimate", "may", "will", "aim", "goal" and similar expressions identify forward-looking information and statements. In addition to the forward-looking information and statements noted above, this presentation includes those that relate to: the expected results of exploration activities; the estimation of mineral resources; the ability to identify new mineral resources and convert mineral resources into mineral reserves; ability to raise additional capital and complete future financings; capital expenditures and costs, including forecasted costs; the ability of the Company to comply with environmental, safety and other regulatory requirements; future prices of precious metals; the viability of restarting operations at the mining project; the ability of the Company to obtain all necessary approvals and permits in connection with the development of the mining project. Such forward-looking information and statements are based upon a number of estimates and assumptions that, while considered reasonable by the Company as of the date of such information and statements, are inherently subject to significant business, economic and competitive uncertainties and contingencies. Known and unknown factors could cause actual results to differ materially from those projected in the forward-looking information and statements. Such factors include, but are not limited to, fluctuations in the price of wollastonite and other commodities, the inability of the Company to raise sufficient monies to carry out its business plan, changes in government legislation, taxation, controls, regulations and political or economic developments in Canada, the accuracy of the Company's current estimates of mineral resources and mineral grades and its preliminary economic assessment, the accuracy of the geology and vein structures at the mining project, the maintenance of access to surface rights, risks associated with mining or development activities, including the ability to procure equipment and supplies, including, without limitation, drill rigs, the speculative nature of exploration and development, including the risk of obtaining necessary licenses and permits and the ability of the Company to re-start operations at the mining project. Many of these uncertainties and contingencies can affect the Company's actual performance and could cause actual performance to differ materially from those expressed or implied in any forward looking information and statements made by, or on behalf of, the Company.

Readers are cautioned that forward-looking information and statements are not guarantees of future performance. Forward-looking information and statements are subject to a variety of risks and uncertainties and there can be no assurance that such information and statements will prove to be accurate, and actual results and future events could differ materially from those presented in such information and statements. Such risks include, but are not limited to, the volatility of the price of wollastonite, uncertainty of mineral resources, exploration potential, mineral grades and mineral recovery estimates, delays in exploration and development plans, insufficient capital to complete development and exploration plans, risks inherent with mineral acquisitions, delays in obtaining government approvals or permits, financing of additional capital requirements, commercial viability of mineral deposits, cost of exploration and development programs, risks associated with competition in the mining industry, risks associated with the ability to retain key executives and personnel, title disputes and other claims, changes in governmental and environmental regulation that results in increased costs, cost of environmental expenditures and potential environmental liabilities, accidents, labour disputes, and the inability of the Company to start operations at the mining project. Should one or more of these risks and uncertainties materialize, or should underlying assumptions prove incorrect, actual results may vary materially from those described in forward-looking information and statements.

Overview

Who we are

- **Vertical Exploration** is a Canadian mining company which is listed on the Toronto Venture Exchange ("V.VERT").
- Its 100%-owned flagship asset**, the St. Onge wollastonite project**, is fully permitted and located in the mining-friendly Lac Saint Jean region of Quebec.

What we do

- **Vertical is focused on fast-growing markets, regionally and internationally, for its distributed wollastonite product,** including organic and regenerative farming, environmental remediation, cannabis/hemp and industrial applications.
- It distributes its product directly to customers and through established retailers and wholesalers, offering competitive prices vs conventional products.

Our Impact

- **Vertical's product improves soil health, crop quality and boosts farmer margins. By increasing soil carbon, it can play a meaningful role in addressing climate change through carbon sequestration and reduced GHG emissions.**

Vision: to become the dominant provider of wollastonite to the regenerative soil nutrient sector in North America, by 2025.

Investment Highlights

Mining-Friendly Jurisdiction

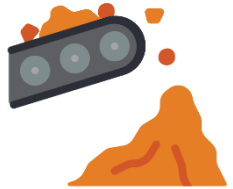
Experienced Regional Management Team

Fully Permitted & Licensed

Excellent Regional Infrastructure

Simple Quarry Operation

Simple, Proven Flowsheet



Open-Pit Mining With Low Strip Ratio

No Tailings Dam

Product Can Sequester CO_2

SHARE STRUCTURE

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Issued and outstanding	123,284,053
Warrants	31,271,701
Options	5,575,000
Fully Diluted	160,130,754
52 week high	C$0.205
52 week low	C$0.040

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What is Wollastonite?

- **Wollastonite is a naturally-occurring, calcium metasilicate (CaSiO3) mineral** with a theoretical composition of 48.3% CaO and 51.7% SiO_2, and an acicular (needle-like) particle shape. It is usually white and can withstand temperatures up to 1540°C.

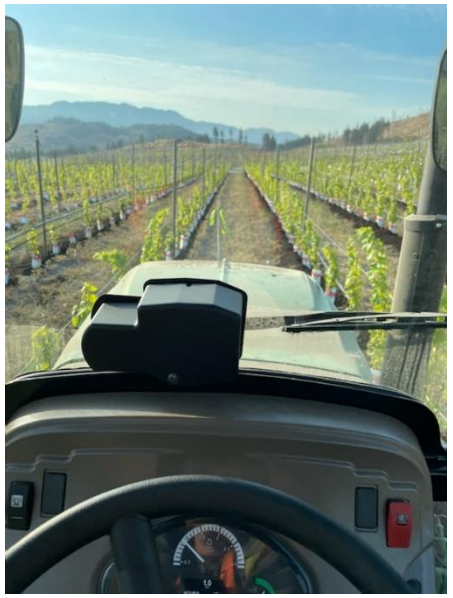
- **Geology:** Wollastonite is formed when impure limestone or dolostone undergo high temperature and pressure changes, sometimes in the presence of silica-bearing fluids, as in skarns or contact metamorphic rocks.

- **Physical Properties:** High brightness / Low moisture and oil absorption / Low water solubility / Basicity / Low volatile content / High melting point / Acicular crystal structure / Relatively high hardness (4.5 on Mohs' scale)

- **Availability:** According to the USGS summary on wollastonite, total global sales of refined product in 2019 amounted to around 850,000 tonnes, with China alone accounting for almost 70%.

FIGURE 1: Wollastonite Cluster

Principal Applications



- Wollastonite can be crushed into powder form, like any standard quarry product**. It has a wide range of industrial applications,** including ceramics, polymers such as plastics and rubber, paint fillers, metallurgy, paper and friction materials.
- **When applied to land and exposed to natural weathering,** wollastonite breaks down into **calcium** and **silicon**, a combination of nutrients which promote plant growth, alleviate various environmental stresses and **which can mitigate many of the negative effects of current crop production practices and climate change**.

Favourable Location & Infrastructure

- **Vertical is currently the only listed junior mining play with a world-class wollastonite deposit in production**.
- The St Onge deposit is located 80km north of the city of Alma in the Lac St Jean region of Quebec.
- Quebec is an internationally-recognised, friendly and secure mining jurisdiction (Fraser Institute 5th place 2021) and supported production of refined wollastonite products in the 1990s.
- **Excellent regional infrastructure:**
  - Lac St Jean region – mining expertise / manpower
  - Significant hydro-power dam system in region to supply electricity to the aluminium producers
  - Accessible by well-maintained gravel road
  - 50 km from rail line
  - 100 km from international sea port in Saguenay
- **Operation-ready with a highly-qualified regional team in place.**

FIGURE 2: Location of Saint Onge Wollastonite Deposit

Mineral Resources	Wollastonite (%)	Tonnes
Measured	36.20	7,155,000
Indicated	37.04	6,926,000
Measured & Indicated	36.61	14,081,000
Inferred	40.25	17,896,000

TABLE 1: Pit constrained mineral resources at Wollastonite deposit (COG at 30% Wollastonite) from NI43-101 Resources Calculation Report April 2018.

Between 1992 and 1995, Orleans Resources carried out major exploration programs and important results were obtained:

- A mineralized envelope extending 2,300 metres in a north-east to south-west direction, outcropping at surface through an exploration depth limited to 100 metres over true widths ranging from 20 to 98 meters.
- **According to Orleans, the concentrates produced from the deposit met the highest of industry standards in terms of aspect ratio, whiteness, loss on ignition, oil absorption and pH**, key characteristics for acceptance of products on international markets.

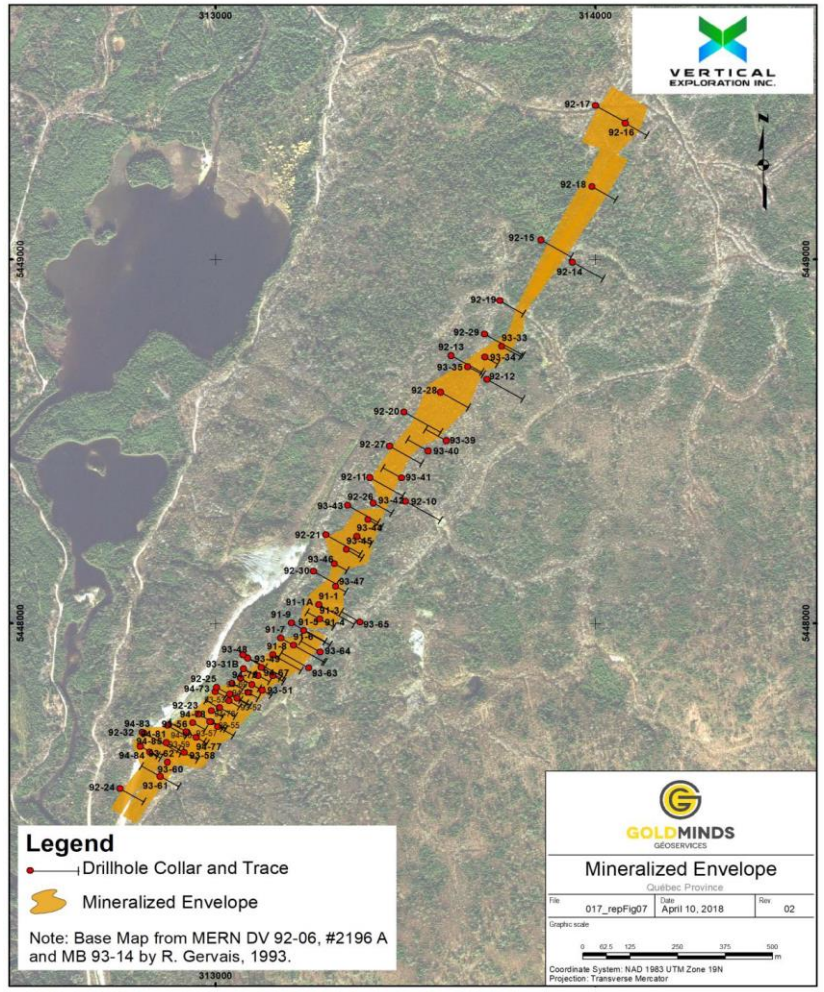


FIGURE 3: Saint Onge Exploration & DDH Locations

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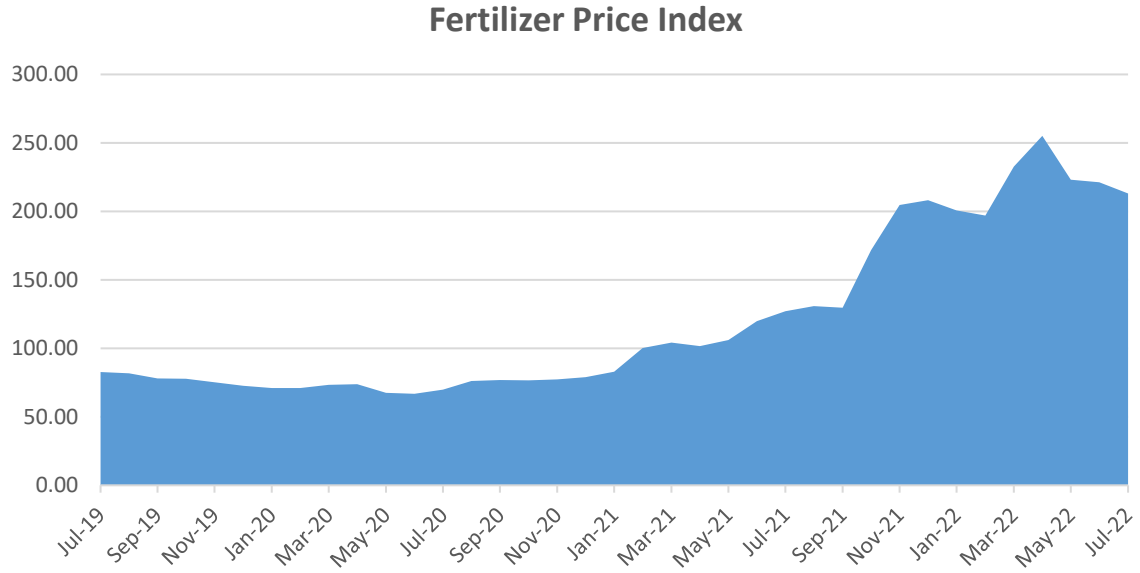
Agriculture System Pressures

Vertical's Wollastonite - the right product at the right time

Shrinking Margins for Farmers

FIGURE 4: Spreading fertilizer



SOURCE: World Bank "Pink Sheet" Data. 2010 = 100

- **Unpredictable weather patterns**, affecting planting and quality of harvest
- **Entrenched inflation,** including higher fertilizer, fuel, labour, rental and financing costs
- **Supply chain disruptions**, causing delays in getting access to spare parts for machinery repair
- **Environmental effects:** ongoing top-soil degradation, depleting aquifers, pest resistance and nutrient replacement
- **Stretched consumer affordability:** elevated personal debt and rising cost-of-living pressures

Fertilizer Sector Pressures

Geopolitical

- **Sanctions on Russia and Belarus.**
  - Belarus supplies almost one fifth of the world's potash and is the third largest exporter, while, in addition to potash, Russia is a key exporter of nitrogen and phosphate;
  - Trade re-routings amid availability concerns;
  - Several governments (e.g. China) have implemented restrictive export policies to protect domestic supply of fertilizers.

Economical

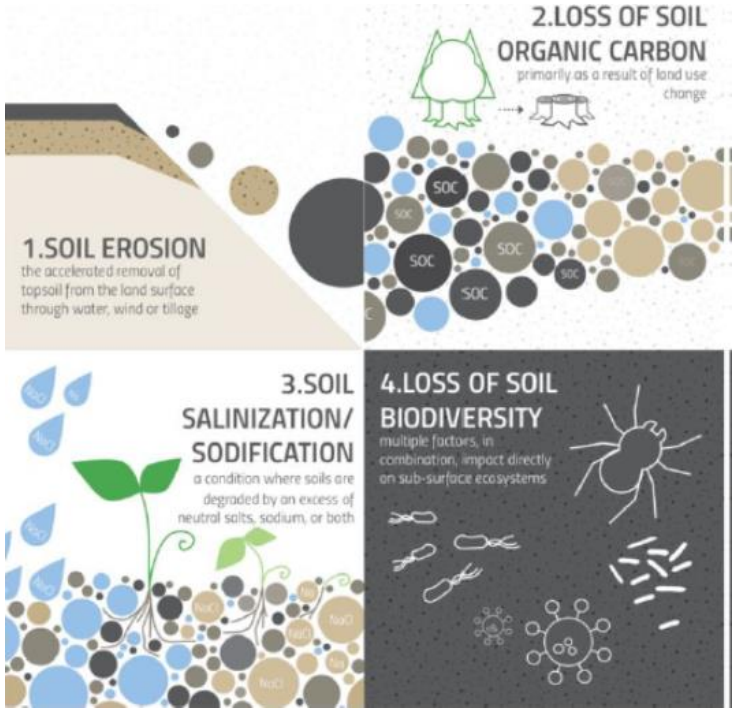
- **Fertilizer demand recovered strongly post COVID-19 Pandemic**
  - Strong emphasis on food security boosted by government support
- **Higher raw material input costs have negatively affected supply**
  - Several key fertilizers are energy-intensive (e.g. 70%+ of ammonia cost curve)
  - Current gas prices in Europe are up to 5x higher than a year ago!
  - Fertilizer plant shut downs and spiralling freight costs contributing to supply constraints

Environmental

- **Government Policy on Climate Change**
  - Consultations and legislation to reduce absolute greenhouse gas (GHG) emissions associated with fertilizers by 30% below 2020 levels, by 2030

Deteriorating Top Soils

- **Soils have become one of the world's most vulnerable resources in the face of climate change, land degradation, biodiversity loss and increased demand for food production.**[1]
- Annually, an estimated 24 billion tons of fertile soil are lost globally due to erosion, while arable land loss is estimated at 30 to 35 times the historical rate.[2]
- Healthy soil contains aggregates that help it bind together, **preventing erosion and run-off**. It can **hold more water**, so plants fare better in drought. It contains more bacteria and fungi that help plants **fight diseases and pests**. And healthy soil also contains **more minerals and nutrients** that feed plants.[3]
- **Soils also constitute the largest terrestrial carbon reservoir and play crucial roles in the global carbon balance by regulating dynamic biogeochemical processes and the exchange of greenhouse gases (GHGs) with the atmosphere**.[4] The top 1 metre of soil contains an estimated 1,417 gigatonnes (GtC) of Soil Organic Carbon ("SOC"), which is nearly twice the quantity of atmospheric carbon (847 GtC as CO2).[5]



Soil health is intrinsically linked to the integrity and sustainability of the food system, affecting everything from plant health to human well-being.

Political Pressure to Change

The context

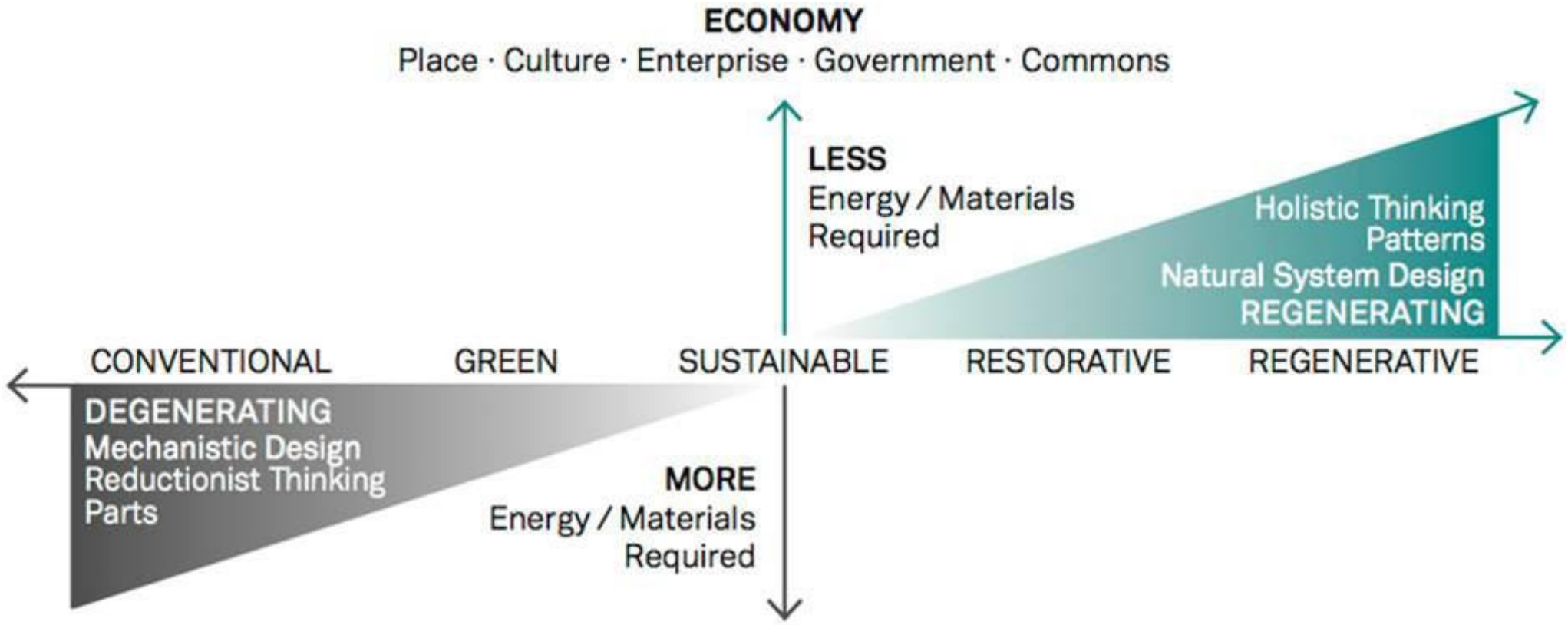
- Population increases and the economic growth of developing countries are fuelling global food consumption.
- The enormous gains in Western agricultural production and productivity since 1970 (3,030kg/ha vs 1,600kg/ha) **are mainly due to the heavy use of synthetic fertilizers** (106 Mt vs 32Mt) **and pesticides.** The impulse is for more of the same.[6]
- **Yet, Intensive farming has led to land degradation**, salinization of irrigated areas, over-extraction of groundwater, the build-up of pest resistance and the erosion of biodiversity.[7]
- In addition, according to McKinsey, when examined over a twenty-year timeframe**, agriculture accounts for around 20% of global GHG emissions.** A growing population means, *ceteris paribus*, increased GHG emissions.[8]

Why silicates can form part of the solution

- New farm practices and technologies are needed globally to address the impacts of climate change and reduce emissions of GHGs from agriculture.
- **The biggest contributor to the natural cycle of removing CO_2 from the atmosphere is the chemical weathering of certain types of rocks, especially silicates.** Though the process happens in the soil, the origin of the CO_2 is the atmosphere; so, the direct removal of CO_2 responsible for climate change is achieved.[9]
- **Enhanced weathering strategies** involve the distribution of large amounts of crushed silicate materials over open land.
- **Not only do the enhanced weathering strategies capture CO_2 but also help restore soils and resupply impoverished reserves of trace elements important for human nutrition and crop production.**

Consultations and legislation to reduce absolute greenhouse gas (GHG) emissions associated with fertilizers by 30% below 2020 levels, by 2030, are underway in a majority of G20 countries

Impact Opportunity – Regenerative Systems



SOURCE: John Fullerton, "Regenerative Capitalism: How Universal Principles and Patterns Will Shape Our New Economy," Capital Institute, April 2015

Compelling Features of Wollastonite

Desirable Characteristics

- **Vertical's premium wollastonite is sourced from the mining-friendly, secure jurisdiction of Quebec and close to major North-American cereal-growing regions.**
- Wollastonite can be crushed into powder form, and has been **approved for organic farming in the USA**.
- The addition of crushed silicate rocks on open land **helps to address global concerns threatening food security:**
  - **enhance soil organic carbon content** ("SOC") - resupplying impoverished reserves of trace elements important for human nutrition and crop production;
  - **replenish eroded and acidic soils,** which are a global problem**;**
  - **sequester CO2 from the atmosphere** in a process called enhanced weathering**.**
- **The application of wollastonite can help to offset lower-anticipated crop yields arising initially from a shift to organic / regenerative farming.**

A Multi-Purpose Solution

- **A cost-competitive soil amendment product which does not contribute to additional GHG emissions** – quite the opposite: research has shown that the application of wollastonite helps to sequester CO2.[10] ✓
- **A soil amendment which neutralizes soil acidity** in the same manner as agricultural lime ("ag lime"). **Lower soil acidity is linked to the improved availability of plant nutrients and enhanced crop yield**. ✓
- **A soil amendment which breaks down into calcium and silicon**, a combination of nutrients which are beneficial during plant growth:[11] ✓
  - Direct stimulation of plant growth and yield;
  - Resistance to pathogens, helping to reduce the reliance on expensive fungicides and lower input costs;
  - Helps to alleviate various environmental stresses;
  - Improved uptake and utilisation of essential nutrients (N,P,K) while reducing the uptake of sodium and toxic heavy metals.

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Strategy and Target Markets

High Value, High Growth

Strategy

- **Vertical is focused on new and fast-growing markets**, including soil amendments, environmental remediation, cannabis/hemp and industrial applications.
- **The potential use of wollastonite in the Agriculture sector via a simple, low-cost quarry and crushing operation, provides Vertical with a fast-to-market opportunity to exploit the deposit:**
  - Low technical risk; low capital expenditure, relatively little process, no chemical product and no tailings pond.
  - The generation of revenues helps Vertical **to minimize additional capital-calls and shareholder dilution**. In-house analysis supports the view that a crushed product could be delivered cost-competitively versus similar products offered in the market.
- Vertical has retained the services of **AGRINOVA**, a highly-regarded Centre for Research and Innovation in Agriculture in Quebec, **to conduct a three-phase research and development program on wollastonite and agricultural applications for the St Onge deposit, and the registration of products with the Bureau de Normalisation du Quebec** ("BNQ" – the registration agency of Quebec).
- In June 2022, Vertical announced that it was undertaking a three-year research program to assess the potential benefits of **combining Vertical's premium St-Onge wollastonite with Arianne Phosphate Inc's high purity phosphate into new slow-release natural fertilizers** and agronomic products for a range of environmental, forestry and agricultural operations.

Findings – AGRINOVA Phase 1 R&D

In May 2019, Vertical announced **encouraging results** from Phase 1 of its R&D agreement with AGRINOVA on wollastonite from the St Onge deposit:

- **Vertical's wollastonite could be BNQ-certified or registered under the Fertilizers Act in Quebec.** ✓
- **The safety profile of Vertical's wollastonite was successfully demonstrated** by a germination and elongation test with barley. ✓
- **Vertical's wollastonite has a neutralizing power and efficiency which compares it favorably with current lime products** in the market, and that it has appreciable levels of major and minor elements (silicon, calcium, magnesium and manganese) that are essential for plant nutrition and growth. ✓
- Another benefit of Vertical's wollastonite that was identified by AGRINOVA **is its high bio-availability of silicon that leads to both enhanced plant growth and resistance to abiotic and biotic stress in a range of agricultural crops**, as studies have shown there is a significant need for this element that is not being filled by commercial fertilizers. ✓
- Results for the second market study component indicate that wollastonite has a significant potential to be used for maple production (maple syrup production), organic agriculture, sod production, large-scale crops (cereals, corn and soybeans) and boreal forestry (spruce budworm control and post-fire regeneration).

Based on these uses, the potential agricultural demand for wollastonite identified by AGRINOVA in the initial target market could be in the order of 274,000 tonnes for the province of Quebec, plus additional demand of approximately 59,000 tonnes from the Maritime Provinces of Canada.

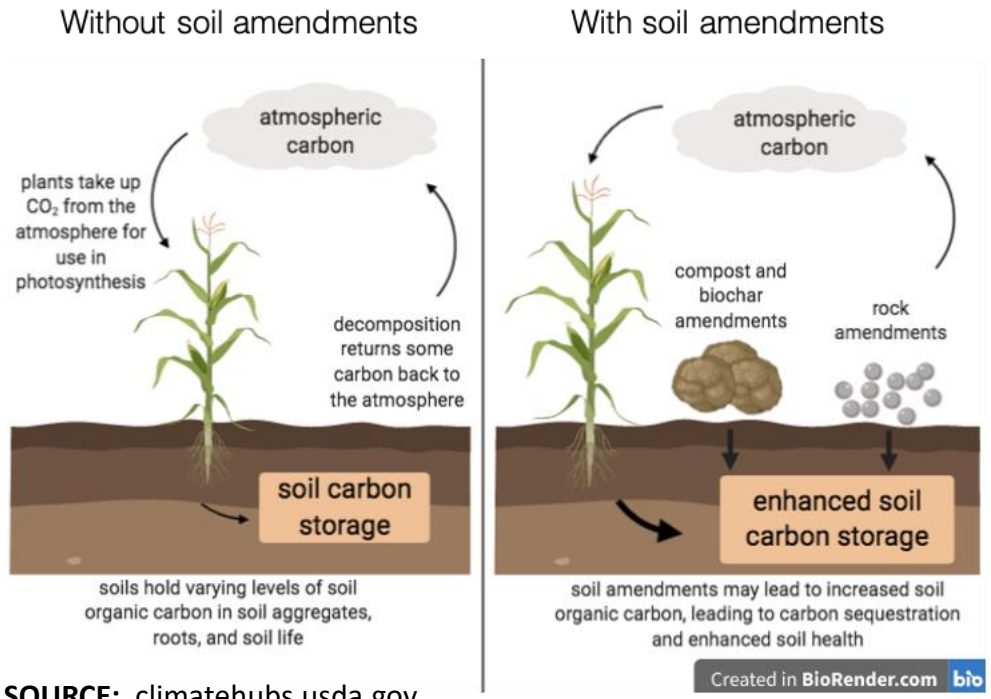
Sales / Distribution Plan

- **Vertical's sales/distribution plan has already been launched**, and has been very successful to date on a test-marketing level – a wide range of agriculture and cannabis companies are currently testing/using Vertical's Wollastonite.
- Vertical's overall sales/distribution structure has been formalized between Vertical and Magnor for the current operations phase.
- First offtake agreement with Quebec business entrepreneur signed in March 2022
- Additional distribution and offtake agreements anticipated to be signed in 2023.

FIGURE 5: Bagged Wollastonite leaving mine-site

Soil Amendments

- Soil erosion in agricultural landscapes reduces crop yields, leads to loss of ecosystem services, and influences the global carbon cycle.
- **In the US Corn Belt alone, it has been estimated that around 24-46% of the top soil has been completely removed by current crop management practices.**[12]
- In economic terms**,** this was calculated to represent a loss of around **US$3 billion p.a.**, although as top soil losses exceed natural rates of formation by an order of magnitude,[13] the longer-term costs in terms of agriculture production and carbon accounting are likely higher.
- Soil amendments are organic and inorganic materials that are employed to improve the texture and physical properties of the soil. They are cost effective and easy to apply, improving soil water retention, nutrient availability, aeration and plant root development.



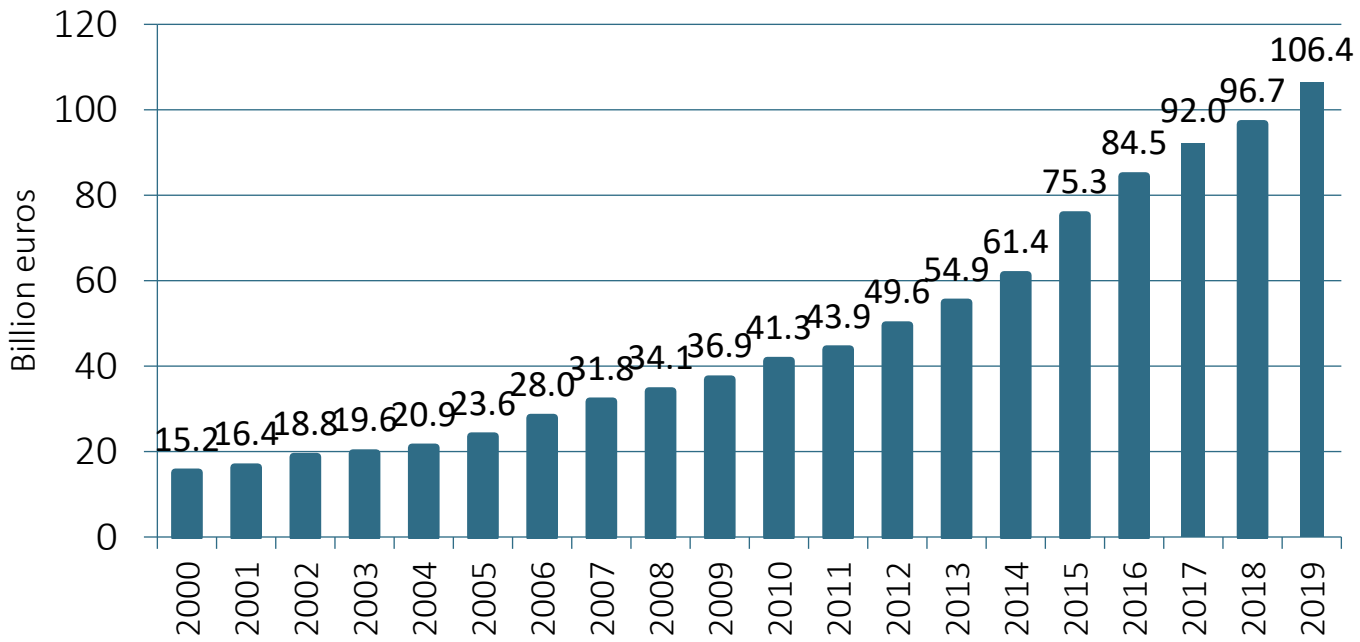
SOURCE: climatehubs.usda.gov

According to a recent report by *Market Data Forecast*, the soil amendment market was valued at US$3.2 billion in 2021, and is projected to grow at a CAGR of 10.4%, to reach US$6.8 billion by 2026.

Growth of the Organic Sector

World: Growth of organic retail sales 2000-2019

Source: FiBL surveys 2000-2021



- **The global market for food sourced organically continues to enjoy strong, multi-year growth trends.**
- **Consumers are becoming more conscious about what they buy**. They're choosing organic because of an increasing awareness that it guarantees higher animal welfare standards, contains fewer pesticides, artificial additives and chemicals, and is better for the environment. It also meets consumer demand for less packaging and products from sustainable farming sources. **Health is a key motivator for the majority of shoppers.**
- **According to the Organic Trade Association, 52% of organic shoppers are millennials (18-34yo) with children**, compared with 35% of Generation X parents and 14% of Baby Boomer parents.

Combined, the market for organic food in the USA, Canada & EU-28 accounts for around 88% of global organic retail trade, and was worth EUR89.6BN in 2019.

Maple Syrup

- **The Canadian maple syrup industry accounts for approximately 75% of the world's maple syrup and is the leading producer of maple products**. In 2020, maple syrup production reached 14.3 million gallons, valued at C$5 billion.
- **The province of Quebec alone accounts for 92% of the country's maple syrup production**. In 2016, about 42.5 million taps produced around 11.5 million gallons in Quebec, with another 5 million taps expected to start production in 2018.
- Assuming 80 taps per acre in mature planting, Maple syrup production in Quebec alone is covered by trees on around **240,000 hectares of land**.
- **Problem:** when soils become too acidic as a result of acid rain, sugar maple trees become stressed and have a harder time growing or producing seeds and seedlings.

FIGURE 6: Sap dripping from a Maple Tree

- **Solution:** Research was conducted at Hubbard Brook Experimental Forest (HBEF), a 3,160-hectare reserve near North Woodstock, N.H. The scientists added wollastonite in a test plot to replicate soil conditions that existed 25 years prior to the loss of sugar maples. Leaves of canopy sugar maples in the study area showed increased concentrations of calcium in just the second year after the wollastonite application, as soil acidity declined from pH 3.8 to pH 5.0. In the fourth and fifth years, leaf manganese concentrations declined (acid rain increases soil manganese, which can be toxic to maples at high concentrations). **By the sixth year of the experiment, the crowns of study-area sugar maples were noticeably healthier than those in nearby, untreated areas.**[14]

Cannabis Cultivation

- In Phase Three trials conducted at BC Bud Depot's ("BCBD") ACMPR-licenced Research and Development facilities in Vancouver, BC., BCBD measured and recorded significant improvements in root mass, powdery mildew control and pest elimination when applying an admixture rate of 10% to 15% wollastonite to the growth medium**. Most notably, powdery mildew, the most common fungal blight to affect Cannabis sativa, was virtually undetectable with wollastonite admixture above 10%.**
- **An admixture above 10% wollastonite also correlated with sharp reductions in the presence of thrips and fungus gnats**, insect pests with a sub-soil life phase in which the wollastonite crystals lacerate and impale their soft bodies, interrupting the life cycle without the use of pesticides. Root health indicates a plant's ability to resist disease and to support high yields of high-quality of finished cannabis.
- **Wollastonite's unique properties also allow it to break down into calcium, magnesium and silicon in a highly bio-available form that balances soil PH throughout the growth cycle** – this allows the cannabis plants to absorb silicic acid and promotes strong cell walls that better resist insect feeding and spore penetration, supporting increased growth and elevated product yields.

FIGURE 7: Cannabis Cultivation in British Columbia

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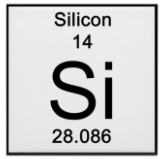
Appendix
Silicon in Agriculture

Understanding the value of silicon as a crop nutrient

The Role of Silicon in Plants



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The practice of utilizing silicon in agriculture has expanded in recent years as awareness of its exceptional benefits has gained recognition:

- **Direct stimulation of plant growth and yield**. Silicon is primarily deposited on the walls of the epidermis and vascular tissues, conferring strength and rigidity on cell walls, and contributing to erect form and improved photosynthesis.[11]
- **Resistance to Pathogens.** When silicon is deposited beneath the cuticle to form a cuticle-Si double layer, penetration by parasitical insects is physically impeded and the infection process is disrupted. The presence of silicon has been shown to protect against fungal pathogens (such as powdery mildew, gray leaf spot and rice blast) and some insects (such as stem borers, leaf spider mites, aphids and thrips).[15]
- **Silicon alleviates various environmental stresses**, including lodging, drought, temperature extremes, freezing, UV irradiation.[16] It increases drought tolerance in plants by maintaining plant water balance, photosynthetic efficiency, erectness of the leaves and structure of xylem vessels under high transpiration rates owing to higher temperature and moisture stress.[17]
- **It facilitates the improved uptake and utilisation of essential nutrients** (e.g. N,P, K) while reducing the uptake of sodium and toxic heavy metals, (such as aluminium and manganese) and increases P availability, especially in highly weathered acidic tropical soils.[18]

	IN SOIL	IN PLANT	
		PHYSIOLOGICAL	MECHANICAL
Increases resistance to pathogens and insects		X	X
Reduces Phosphorous deficiency	X	X	
Increases resistance to wind and rain			X
Alleviates drought		X	X
Alleviates salt stress		X	
Alleviates Fe toxicity	X		
Improved intake of N, P, K & Ca		X	
Reduces intake of nutirents when P&N are in excess		X	
Alleviates Mn, Cd and As toxicity	X	X	
Alleviates Al and Zn toxicity	X	X	X

TABLE 2: Known Benefits of Silicon in the Soil and Plant (adopted from F. Guntzer et al 2012)

Silicon Fertilizer Yield Enhancement

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Crop Tested	Yield Increase Percentage Range	Average Yield Increase (%)	Benefit / Cost Ratio	Number of Trials
Rice	3.5–28.5	10.3	4.4	50
Maize	5.6–10.4	7.7	3.1	44
Cucumber	9.4–25.6	13.7	42.9	40
Tomatoe	8.7–15.9	12.0	35.7	35
Soybean	7.5–13.6	11.0	1.7	32

TABLE 3: The effect of field application of blast furnace slag-based silicate fertilizer on crop yield and benefit/cost ratio during 2005–2006 in north-eastern China (Y. Liang et al., unpublished). Silicon in Agriculture From Theory to Practice 2015. Liang P210.

It has been well documented that silicon (Si) is effective in enhancing the growth and yield of many crops of agricultural and horticultural importance. The major crops that are widely reported to respond positively to Si fertilization include some monocotyledonous crops such as rice, wheat, maize, barley, millet, sorghum and sugarcane (that actively absorb and accumulate a high amount of Si in their organs), and some dicotyledonous crops such as cotton, soybean and some vegetable and fruit crops that are also able to accumulate Si through specific transporters.

The data from TABLE 3 clearly show that, with the exception of maize, although the average yield increase for all the crops tested was above 10 %, the ratio of benefit to cost differed greatly with crop species mainly due to the per unit area crop yield and the price of the products. **The application of Si fertilizer to greenhouse-grown cucumber and tomato led to extremely high economic benefits and thus was welcomed commercially.**

Pathogen Suppression by Silicon

Crop		Description
Rice	Disease	Leaf and neck blast, Brown spot, Sheat blight, Leaf scald, Grain discoloration, Stem rot
	Pest	Stem maggot, Green leaf hopper, Brown plant hopper, white backed plant hopper, Leaf spider, Stem borer, Grey garden slug, Mites
Sugarcane	Disease	Sugar rust, Ring spot
	Pest	Stalk borer, Stem borer
Wheat	Disease	Powdery mildew, aphids
	Pest	Green bug, Red flour beetle
Banana	Disease	Panama wilt
Grape	Disease	Powdery mildew
	Pest	Fruit cracking
Cucumber	Disease	Powdery mildew, Root disease
Cowpea	Disease	Rust
Barley	Disease	Powdery mildew,
Pea	Disease	Leaf spot
Strawberry	Disease	Powdery mildew
Corn	Pest	Leaf aphid, Borer
Sorghum	Pest	Green bug

SOURCE: A case for Silicon Fertilization to Improve Crop Yields in Tropical Soils. 2013. Meena VC, Dotaniua ML, Coumar V, Rajendiran S, Ajay, Kundu S, Subba Rao A Pages 509-510 Tables 5 & 6.

Example - Powdery Mildew

- **Powdery mildew is a fungal disease of the foliage, stems and occasionally flowers and fruit, and is a major pathogen of cereal crops and many common edible and ornamental garden plants**, including apples, pears, plums, blackcurrants, most berries, grapes, tomatoes, zucchini, beans, cucumbers, squash, pumpkin, wheat, Kentucky bluegrass, dogwood, roses and zinnia. **While it usually doesn't kill plants, it can reduce marketable plant yield considerably: for example, in strawberries, between 20-70%.**[19]
- Greenhouse studies conducted at Rutgers University Vegetable Research Farm in East Brunswick, New Jersey from January 2013 to January 2014 found that **wollastonite delayed the onset of powdery mildew disease by 20 fold more than all other amendments.**[20]
- Fungicides are often used to control powdery mildew, but this approach to disease management is unsustainable over the long term since diseases tend to develop resistance to chemical sprays.
- <u>In the case of certified organic production, growers need alternatives to prohibited pesticides</u>.

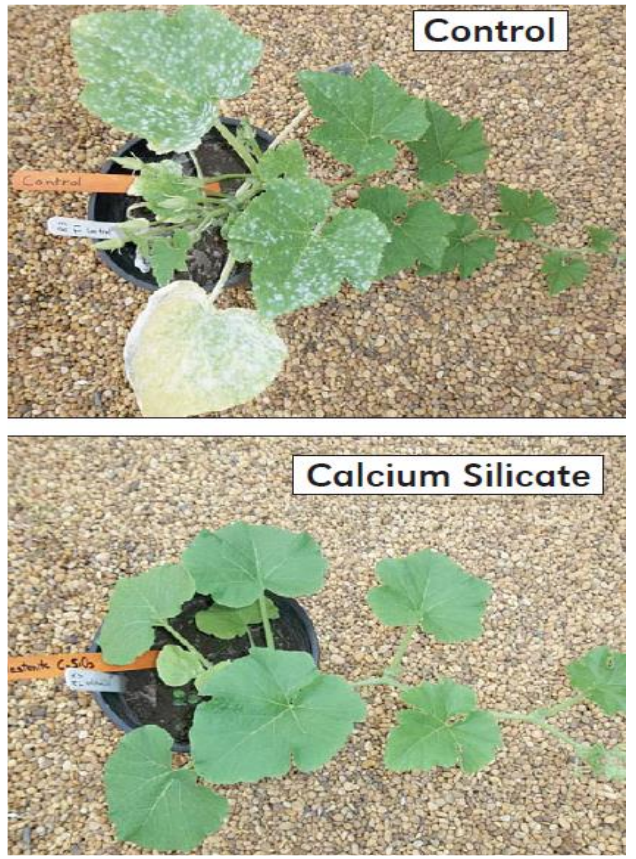

FIGURE 8: Powdery mildew disease suppression in pumpkin plants following wollastonite application.

Wollastonite helps crops resist powdery mildew disease and has been certified for organic farms in the USA.

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