
THANK YOU FOR
GROWING WITH US FOR
60 YEARS
BERGER
TOURBE
DE SPHAIGNE
As your needs
have changed
and grown
over the past
sixty years,
so have we.
Berger
1963-2023

Mélissa Berger, Co-Ceo

Valérie Berger, Co-Ceo

CELEBRATING 60 YEARS OF EXCELLENCE

A journey of innovation and success

We are delighted to present this special edition souvenir booklet commemorating the 60th anniversary of Berger. As we reflect upon three family generations of remarkable accomplishments, we are filled with immense pride and gratitude for the incredible journey we have undertaken. Since our establishment in 1963, Berger has grown from humble beginnings into a global leader in the horticulture and agriculture industry. Throughout the years, we have embraced change, adapted to evolving markets, and consistently strived for excellence. This milestone serves as a testament to the unwavering dedication and visionary leadership that have propelled us to great heights.

However, our success would not have been possible without the invaluable support of our loyal customers, dedicated employees, and esteemed partners. Each stakeholder has played an integral role in our growth, and their trust and collaboration have been the cornerstone of our accomplishments. We owe a debt of gratitude to every individual who has contributed to our journey, and we cherish the relationships we have built along the way.

As we celebrate this significant milestone, we also look to the future with renewed excitement and optimism. Our 60th anniversary not only serves as a commemoration of our past achievements but also as a springboard for what lies ahead. We remain committed to pushing boundaries, exploring new horizons, and embracing emerging opportunities. With the same pioneering spirit that has guided us thus far, we are poised to lead the way in shaping the next chapter of our industry.

In this souvenir booklet, you will find a collection of stories, memories, and highlights that encapsulate our rich history. It is a tribute to the remarkable individuals who have been part of our company's journey, from the early days to the present. We invite you to delve into these pages and immerse yourself in the remarkable tales of our collective achievements.

Together, we have accomplished great things, and together, we will continue to innovate, inspire, and make a difference. Here's to the next 60 years of success and beyond!

Thank you for joining us in celebrating this momentous occasion.

Mélissa & Valérie Berger,
Co-CEOs of Berger

Berger

FAMILY VALUES

Berger's Leadership is Rooted in the Company's Respect for its Customers and Employees

A dynamic force at Berger since taking over the company's leadership in 2015, co-CEOs Valérie Berger and Mélissa Berger embody the very DNA of the family-owned company, which was started in Saint-Modeste, Quebec, by their grandparents Huguette Théberge and Alcide Berger in 1963.

The sisters have led the company's continued success through the development and deployment of a clear and energizing vision that allows Berger to pursue its growth in line with respect for the foundations of the company. They do so while maintaining the values instilled by preceding generations, including their father, Claudin Berger, and their uncle, Régis Berger. Claudin and Régis, the sons of Alcide and Huguette, led the company from 1980-2015.

Valérie and Mélissa are distinguished by their ability to manage as a duo, and in particular, by the family spirit of the values that they stand for.

"The values instilled by preceding generations are very dear to us," Valérie says. **"Notably, they have allowed us to develop a unique customer approach, based on close relationships."**

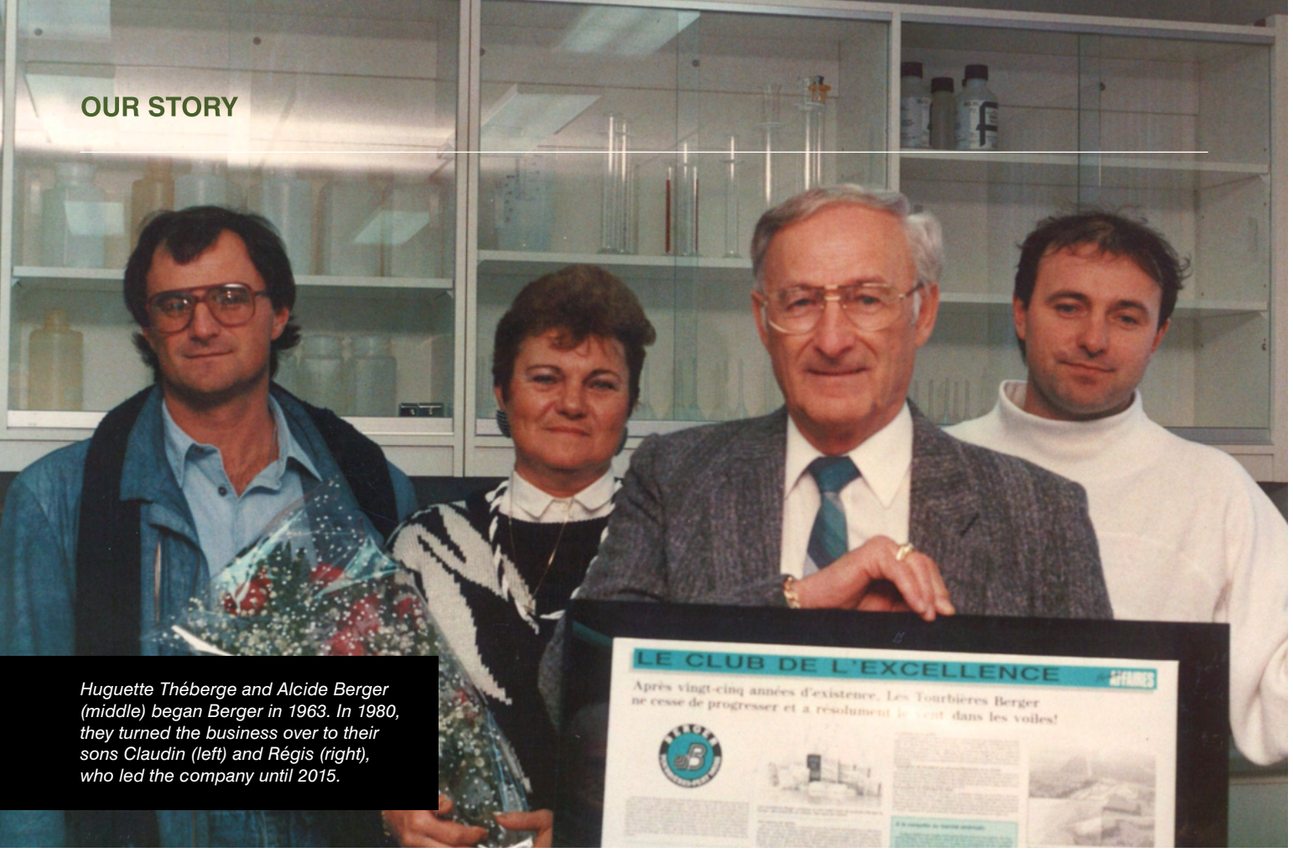
In addition to its family base, "Berger's uniqueness is due to the individuals who make up the company," Mélissa says. "It is really a true and big family, whose commitment helps to create the company's continuous growth." The management method preferred by Valérie and Mélissa is customer-centric, with a focus on building solid relationships and maintaining outstanding customer service. At home, Valérie and Mélissa have instilled a collaborative spirit among employees. The approach has proved to be fruitful. Under Valérie and Mélissa, Berger's ascent has continued at a rapid pace, propelled by various acquisitions and major investments, along with the launch of innovative products.

Co-CEOs and sisters Valérie Berger (left) and Mélissa Berger, who have led the company since 2015, have managed Berger with a clear and energizing vision.

Valérie and Mélissa have shifted the company's focus to the market with the goal of manufacturing products directly in line with buyers' requests, which has been an enormous boost for the company's growth. New processing plants have been constructed. The acquisition of several peat bogs has ensured a reliable supply of top-quality peat moss. There have also been three commercial acquisitions, the largest located in the U.S. and the other two in Quebec, which have enlarged the team and improved its expertise.

In 2018, Berger announced a significant investment over a three-year period to assure the company's continued growth and development. The investment has allowed the company to carry out an expansion plan, including the creation of 55 new jobs. With the investment, Berger has increased its research and development capacity with new facilities, including a state-of-the-art research greenhouse. Investment has also increased the company's production capacity, modernized its management systems, and consolidated its distribution network.

"My sister and I want to pursue our grandparents' dream of promoting the development of our region and creating a workplace where people can make a difference and achieve their full potential," Valérie says.



Huguette Théberge and Alcide Berger (middle) began Berger in 1963. In 1980, they turned the business over to their sons Claudin (left) and Régis (right), who led the company until 2015.

An Innovative Spirit

Each Berger generation has distinguished itself by its innovations. The founders invested in the automation of the harvest in the 1970s, a bold choice for the time. When the company was taken over by Claudin and Régis in 1980, the brothers worked to improve marketing and distribution under the name of Berger, and created added value for the sale of peat moss, with mixes for professional growers. Thanks to a spirit of innovation and to a sharp business sense, Régis and Claudin were able to propel the company to the success it is experiencing today. They led the manufacturer to sell its products under the banner of Berger for the first time.

The determination and close collaboration of the two brothers yielded positive results: In 1984, Berger was the leader in the sector of value-added horticultural mixes for professional growers. This direction had an important influence on the future international success of the family company. This was followed by the acquisition of various bogs elsewhere in Canada to guarantee the availability of raw material and then the construction of several plants for the processing of peat moss. In this were established the first foundations of what would later become the main distinguishing aspects of Berger's offer: the exceptional quality and uniformity of its products.

The growth of the company followed with several commercial successes and social and environmental initiatives. The growing substrates are now sold and exported to the United States, Japan, Mexico, South Korea, Central America, and South America.

Along with each leading family generation, the employees have been recognized as not only the lifeblood of Berger, but also the torchbearers of the company's legacy and continued success.

The Past Drives the Future

Berger's roots harken back to 1949 in Saint-Fabien, where Louis-Philippe Théberge developed a veritable passion for amassing peat moss. Théberge was able to transmit the love of his profession to his daughter Huguette, who in turn laid the foundations of the Berger company we know today. And it was only later that her husband Alcide joined her. Today, Berger is recognized throughout the world for the quality and consistency of its products, which are now distributed under the Berger brand directly to professional growers. Berger employs more than 800 people all across America. Since its creation, Berger has continued its rise thanks to a common dream: to develop unique knowledge and cultivate real relationships with partners and employees.

OUR STORY

Berger: A Local and International Player

For 60 years, Berger has played a leading role in the economy of the Rivière du-Loup (Quebec) area. Born out of a dream, the company today enjoys international fame in the horticultural industry for the selection of the best growing mixes. Thousands of growers from over 20 countries rely on Berger's products and services.

The company has been able to grow in large part thanks to the eagerness to innovate shown by every member of its team. In addition to developing value-added products, which today are prized for their quality and consistency, the company has also revolutionized the industry by creating its Skyscraper, the most widely used packaging format today.

Berger has extended its network of peat bogs and factories throughout North America, from New Brunswick to Manitoba in Canada, to Texas and California in the U.S. In addition, Berger has developed expertise in the selection and treatment of raw materials. Thanks to its deep commitment and its focus on performance, the company has been able to perfect its techniques and to continually innovate, thus ensuring it delivers the highest quality products to its customers.

Three Generations

Since its creation in 1963 by Huguette Théberge and her husband Alcide Berger, the company has continued to grow, thanks to great visionaries who were driven to action. This is how the second generation, led by brothers Claudin Berger and Régis Berger, was able to attain an international reputation for the organization and raise it to the position that it occupies today. The third generation has kept the wind in its sails. The arrival of Valérie Berger and Mélissa Berger, Claudin's daughters, has brought with it a clear and inspiring vision that allows Berger to build on its momentum, while still maintaining the foundations of the company.

Growth Is Ongoing

For the last several years, Berger has continued to grow at lightning speed. This expansion can especially be seen in major investments.

New plants have been established on the North Coast, Rivière-Pentecôte, Quebec, in 2016, and at Oakbank, Manitoba, in 2021. In addition, Berger made many acquisitions over time, including: Specialties Robert Legault and then Tourbières Théberge. In 2017, Berger announced a significant investment, spread out over a period of three years, to continue the company's growth. The investment helped increase production capacity and research and development efforts.

CONSTANT COMMITMENT

For Berger, Sustainability Will Always be About Striving to Reach the Next Level

As a family-owned business, it's part of Berger's DNA to constantly seek innovative processes and solutions that allow it to continue to responsibly select and process raw materials. Improving the environmental and socio-economic footprint for the sake of present and future generations has always been a guiding principle for the company.

Berger's Resource department has developed and implemented the best practices to ensure that the company meets its customers' demands for peat. Its role is to work with stakeholders to ensure the resource perennity.

Pierre-Olivier Sauvageau, an expert in natural resource management and environmental impact assessment, considers Berger a leader and pioneer in responsible peat management practices. For instance, the resource counselor at Berger says Berger holds itself to a high degree of commitment and accountability when restoring a harvested peat bog – a multi-year process involving growth of various vegetation communities – to its original ecosystem so it can re-establish itself naturally and continue to regenerate peat.

"My job is to make sure we manage the resources carefully." Sauvageau says.

For several decades, Berger has been involved in a number of research projects aimed at peatland restoration. The company has contributed with its resources and knowledge to improve peatland rehabilitation techniques, Sauvageau says. Berger has detailed restoration plans for its harvest sites, including the re-establishment of wetland ecosystems that accumulate peat and store atmospheric carbon dioxide (CO_2).

Chuck Buffington, Berger's Vice President of Sales, says Sauvageau's assessment is vital so Berger can assure its customers of future supplies.

"We have a responsibility to our customers to ensure we have availability of the resource well into the future since it's a major part of growers' operations and their success," says Buffington, who also stresses the importance of educating Berger's customers about its sustainable restoration efforts. "We not only owe that to the environment, we also owe it to our customers to let them know the products we're selling them come from responsibly managed resources."

Not only that, but the products are also of the utmost quality, Buffington adds. He says every industry company has a strategy to maximize its value and differentiate itself, and Berger's is to sell peat as a value-added substrate product.

"We're not typically selling peat as a commodity," he adds. **"We create a value added product used by growers for the majority of almost everything we harvest from our fields."**

THE ENVIRONMENT

A Work in Progress

To improve peat management and practices, including new techniques for harvesting peat that are more efficient and have less impact on the environment. "We need to be well-connected to gather the information needed to make good decisions," he adds.

Sauvageau sees Berger as a prominent industry leader that has been at the forefront of advocating for the peat industry's responsible development. The company's efforts are geared towards striking a balance between economic growth, environmental stewardship, and social responsibility.

Berger is certified by Veriflora®, an eco-labeling program for responsibly managed peatlands. Veriflora, known as the gold standard of third-party certification programs in the floriculture and horticulture industries, recognizes companies for their efforts to protect the environment as well as their commitment to their employees, communities, business partners, and other stakeholders.

"It's a lot of commitment and effort," Sauvageau says of the designation. **"It's a badge of honor to know we are [certified by Veriflora] in our peatland management."**

Veriflora requires an ongoing commitment to sustainability and environmental responsibility. That said, it takes time and effort to fulfill year in and year out, Sauvageau says. "But we firmly believe that the challenge is worth it, because it makes us do what we need to do, to be environmentally responsible," he adds. Buffington says Berger's customers desire products that are Veriflora-certified.

CERTIFIED veriflora® SUSTAINABLY GROWN www.veriflora.com

"Our growers want to know the products they're using as inputs come from a reputable source and that the products are responsibly sourced, managed, and shipped," he adds. "In our case, it's about the peatlands being responsibly managed. It's also about the company having fair labor practices and all the other things that encompass the Veriflora certification."

For Berger, sustainability will always be a work in progress. Berger will always be striving to take it to another level, Buffington says.

"The company is committed to using processes and strategies that support environmental, social and economic well-being wherever we operate.," he stresses. "We are going in a direction the ownership is passionate about."

RESPONSIBLE PEATLAND MANAGEMENT

Responsible management is the commitment to making ethical business decisions that will have the least negative impact on the environment and the most positive impact on our communities.

Did you know?

Peatlands account for 2.8% of the surface worldwide, and are therefore an extremely important ecosystem.

- Only 0.03% (35,000 hectares) of Canadian peatlands have been harvested by the industry;
- NONE of the peat moss harvested in Canada is used as an energy source;The total amount of peat moss harvested by all peat producers each year is smaller than the total volume of new peat moss growth in Canada for the same time period.

For complete details on the Canadian Peat Moss industry, visit https://peatmoss.com/

BERGER TOOLBOX

YOUR COMPREHENSIVE RESOURCE FOR TECHNICAL AND AGRONOMIC EXCELLENCE

We are thrilled to unveil the Berger Toolbox, a curated collection of invaluable technical and agronomic information designed exclusively for you, esteemed professional growers. This cutting-edge document library serves as your go-to resource, centralizing a wealth of knowledge and insights to enhance your day-to-day operations.

With a commitment to your success, we have meticulously compiled a wide range of resources in the Berger Toolbox. From expert guides and best practices to innovative techniques and industry trends, this comprehensive toolkit empowers you to make informed decisions, optimize your greenhouse practices, and achieve exceptional results.

Navigate through the pages of the Berger Toolbox to unlock a treasure trove of technical know-how, unrivaled expertise, and practical solutions tailored to your specific needs. As your trusted partner, we understand the challenges you face and are dedicated to providing the support you require to thrive in the ever-evolving world of greenhouse cultivation.

We invite you to explore the Berger Toolbox and leverage this powerful resource to elevate your greenhouse operations to new heights. Together, let us cultivate success and drive the future of professional greenhouse growing.

Berger, a unique know-how powered by a dedicated team of experts

Recognized as such in the whole industry, Berger's experts are devoted to offering innovative solutions to maximize yield, improve crop quality, and increase operational efficiency of any type of professional growers.

Experience the Berger difference today:

1-888-771-4462
or customerservice@berger.ca

BEST POTTING PRACTICES

Storage

Rotate you inventory (1st in - 1st out).

Ideally, bales/bags should be stored in a cool area out of direct sunlight.

Prevents degradation of the wetting agent.

To facilitate handling, skids should be placed on 2X4s to preserve the wooden pallets.

Prevents them from sinking in the mud or freezing on the ground.

Maintain some space between the skids to allow air movement.

For frozen product, it will accelerate the thawing process. You still need to bring skids inside several days/weeks before processing.

During the summer, it will help keep the product cool.

Handling

Avoid damaging the components.

Select your equipment carefully.

Damage to the product will decrease the particle size which directly impacts the porosity and water retention.

Adjust the moisture content prior to potting or tray-filling. Because our compressed products are delivered with a lower humidity than recommended for optimal use, here is an indicative table of the approximate quantity of water to add to our products before potting.

Add approximately ½ gallon of water per cubic foot of mix (67L of water per cubic meter of mix).

Benefits of proper handling methods

- ✓ Increases the useable volume (yield).
- ✓ High-quality sphagnum peat moss swells when rehydrated. Reduces the presence of dust.
- ✓ Fine particles will cluster together, which creates a cleaner environment for workers.
- ✓ Increases porosity.
- ✓ Expanded peat moss will lock in the porous structure.
- ✓ Improves water distribution.
- ✓ Potting equipment and process shouldn't cause excessive compaction.
- ✓ Avoid compaction.
- ✓ Reduces the surface tension of peat moss, improves the wettability and prevents water channeling.
- ✓ Compressed mixes allow less oxygen back into the mix, hold more water and dry-down slower.
- ✓ Stacked pre-filled containers and trays should not be nested into each other.
- ✓ Promote "uniform" practices.
- ✓ Standard operating practices (SOP) should be established for all potting activities to ensure uniform, consistent and predictable results.

FORMAT	NUMBER OF LITERS OF WATER TO ADD (per unit)	NUMBER OF GALLONS OF WATER TO ADD (per unit)
3.0 ft³ loose*	3 L	0.75 gal
3.8 ft³ compressed**	15 L	4 gal
75 ft³ loose*	75 L	19 gal
Skyscraper compressed**	424 L	112 gal

*Could be used as is, but adjusting moisture content is preferable.
**Since the volume per format depends on the components of our products, the values in the table are an overall average. If you need more information, please contact your sales representative.

GUIDE TO IDENTIFYING THE SYMPTOMS OR CONSEQUENCES OF NUTRIENTS DEFICIENCY OR EXCESS

We have all been told at one time or another that proactivity must prevail over reactivity. This is even more true when you have the responsibility of working with living material. Because a bad diagnosis can be just as damaging to your crops as it is to your budget, this guide should help you get started with your diagnosis.

CLASSIFICATION	ELEMENTS
Macronutrients - Major	N, P, K
Macronutrients - Minors	Ca, Mg, S
Micronutrients - Essentials	Fe, Mn, Zn, Cu, B, Mo, Cl, Ni
Micronutrients - Beneficials	Na, Si, Co, Se

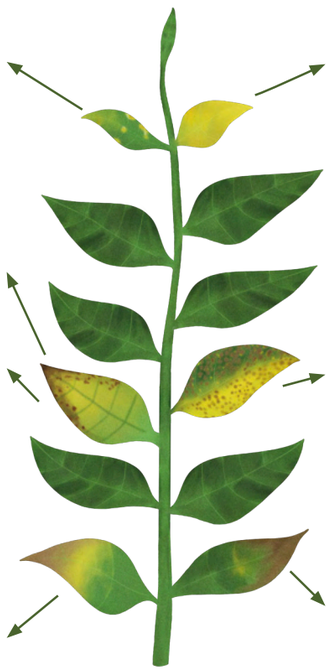
A first step in diagnosing a fertilizer deficiency or excess is usually to locate where the symptoms are on the plant: on the upper, youngest parts, or on the lower, oldest parts. This characteristic depends on the mobility of the elements within the plant (and not within the substrate!).

Except for some cases, when an element is **mobile in the plant, deficiency symptoms will appear on the upper parts, and excess symptoms on the lower part**. You can imagine that it is exactly the opposite when an element is immobile.

As we will not be detailing all the elements in this guide, the following table only reports the mobility of those we have selected.

ELEMENTS	MOBILITY	ELEMENTS	MOBILITY	ELEMENTS	MOBILITY	ELEMENTS	MOBILITY
N	Mobile	Fe	Immobile	Mg	Mobile	Cl^-	Mobile
P	Mobile	Mn	Immobile	S	Immobile		
K	Mobile	Zn	Immobile	B	Immobile		
Ca	Immobile	Cu	Immobile	Mo	Mobile		

Excess Symptoms



Sulfur (S)
Very uncommon, but most crops are sensitive to sulfur dioxide gas when close to a pollution area. The usual symptom is dry, white, and well-defined necrotic spots, mainly on the underside of the leaves. Can also lead to boron and molybdenum deficiencies.

Copper (Cu)
Lead often to iron deficiency and poor lateral root growth.

Manganese (Mn)
Brown spots surrounded by chlorotic tissue, or blackish/purplish spotting on older leaves. Marginal or interveinal chlorosis, and marginal or spots necrosis on new leaves. Induces iron deficiency.

Iron (Fe)
Results in a bronzing of the leaves, followed by tiny brown/black spots.

Magnesium (Mg)
Does not usually cause toxicity, but rather calcium, potassium and sometimes manganese deficiencies.

Phosphorus (P)
Growth slow down mainly by limiting the absorption of zinc, iron, and copper.

Chloride (Cl-)
Leaf spotting, chlorosis, and necrosis of the leaf margins of older leaves. High chloride levels in the substrate can lowers nitrate uptake and vice versa.

Zinc (Zn)
Most crops are tolerant to excesses. However, high concentrations can result in uniform chlorosis of the leaves. Induces iron, manganese, or phosphorus deficiencies.

Calcium (Ca)
Does not generally lead to any toxicity but can prevent seed germination. Mostly lead to magnesium or potassium deficiencies.

Molybdenum (Mo)
So rare that only a few symptoms are known. Most crops can tolerate more than 1000ppm (on a dry basis).

Boron (B)
Chlorosis and subsequent reddish-brown necrosis first of the tips and margins, then of the whole leaf.

Potassium (K)
Induces calcium and magnesium deficiencies, especially when these two elements are present in their minimum required amount.

Nitrogen (N)
Generally due to excess of ammonium. May inhibit calcium, potassium, and magnesium absorption. Wilting and marginal leaf necrosis in older leaves, epinasty, stem lesions, and root tips necrosis (orange-brown).

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Deficiency Symptoms

Boron (B)
Transpiration reduction and high pH lead to boron deficiency. Deformed, wrinkled, thicker and darker colored leaves. Leaves and stems may become brittle. Necrosis of leaves and other parts of the plant. Vein splitting. The roots are slimy, thick, and bumpy, and the tips are necrotic.

Sulfur (S)
Overall chlorosis, more uniform than nitrogen deficiency symptoms. Veins and petiole can show a reddish color on the underside of the leaves.

Manganese (Mn)
Interveinal chlorosis of young leaves, sometimes followed by brown specks in the chlorotic areas.

Zinc (Zn)
Interveinal chlorosis (first pale green, then yellow, and even white) and then necrotic spots. Internodes reduction giving the appearance of a rosette.

Magnesium (Mg)
Interveinal chlorosis, the veins remaining green. A severe deficiency leads to tissue death (indistinguishable from potassium deficiency).

Phosphorus (P)
Often caused by low temperatures. Darker green, then purplish coloration of the leaves (extremities first) which extends into the stems. Slower root growth.

Calcium (Ca)
More often physiological than visual and resulting from a decrease in transpiration. Could still result in deformation, poor root growth, chlorosis, or leaf edge necrosis. Too many nitrates can reduce the calcium content of plants.

Chloride (Cl-)
Interveinal chlorosis young leaves (yes, even if chloride is mobile in the plant!). Severe deficiency can result in curling, wilting and necrosis of the margins of the youngest leaves.

Iron (Fe)
Interveinal chlorosis of the youngest leaves, then global chlorosis ending with a bleached leaf.

Copper (Cu)
Most often interveinal chlorosis but the tips and lobes stay green. Symptoms are reduced growth with distortion of young leaves and necrosis of the apical meristem.

Molybdenum (Mo)
Mottled (as nitrogen) or uniform chlorosis (as sulfur) of central leaves first. May show leaf margin curling then necrosis. Induces nitrogen deficiency.

Potassium (K)
Leaf edge turn light green or yellow while veins stay green. Severe deficiency causes leaf edge burns and then total necrosis.

Nitrogen (N)
Slow growth, chlorosis from light green to yellow, old leaves fall prematurely, and in severe cases, leaf necrosis. High chloride levels lower nitrate uptake.

Essential roles of the main elements

Nitrogen
Helps plants grow by forming important components like amino acids, vitamins, and proteins. It also aids in the formation of new cells, which is necessary for overall plant growth.

Phosphorus
Plays a vital role in the energy transfer and storage within the plant, as well as root and seed growth. It also helps to increase the hardiness of plants and make them more drought resistant.

Potassium
Helps plants use water more efficiently (controls stomata opening) and aids in the production of fruits. It also promotes winter hardiness and helps plants resist disease.

Calcium
Essential for cell formation and division, which is necessary for root growth and overall plant development. It also helps with nitrogen metabolism and fruit set.

Magnesium
Necessary for chlorophyll production (no substitute possible!), which is necessary for photosynthesis. It also helps with the utilization of other nutrients like phosphorus and iron, and it aids in fruit maturation.

Sulfur
Helps to form amino acids, in plant defense mechanisms, and aids in the formation of vitamins and enzymes. It is also important for seed production, legume nodule formation, and for the characteristic smell synthesis of onions and brassicas.

Iron
Necessary for chlorophyll formation and in oxidation-reduction states changes. It also aids in the transportation of oxygen within the plant and promotes cell growth and division.

Molybdenum
Helps to form nitrate reductase and nitrogenase, which is important for nitrogen metabolism and fixation. It also helps to convert inorganic phosphates to organic forms that can be used by plants.

Manganese
Helps with enzyme systems and chlorophyll synthesis. It also makes phosphorus and calcium more available to plants.

Zinc
Important for the formation of hormones and enzymes, as well as the production of chlorophyll. It aids in carbohydrate, starch, and seed formation. Zinc is important for water absorption and utilization by plants.

Copper
Acts as a metabolic catalyst and aids in photosynthesis and reproduction. It also intensifies plant color and flavor and increases sugar production.

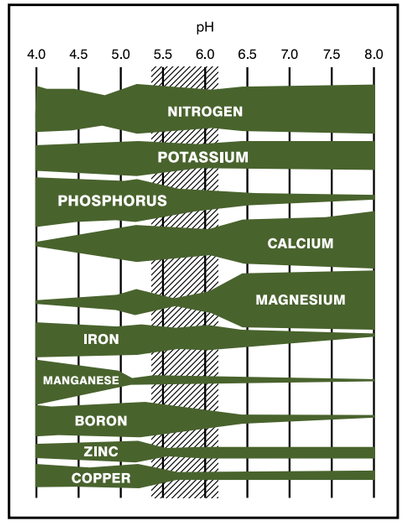
Boron
Necessary for the growth of pollen tube. It also aids in cell wall formation, sugar translocation and promotes maturity in plants. Boron also has an indirect control on germination.

Chloride
Its role in plant growth is not yet fully understood, but it may play a role in plant metabolism and osmoregulation.

NUTRIENT AVAILABILITY IN GROWING MEDIA IS INFLUENCED BY MEDIA PH

This figure is valid for organic soils such as those based on sphagnum peat moss, bark, compost, perlite, vermiculite, etc. As the strip gets thicker, the availability of the element to the plant increases. Be careful, an element that is too available can be toxic for some crops, it is therefore important to respect the recommended pH for each of them. The pH range recommended for most greenhouse crops is highlighted in black.

Adapted from: Peterson, J. C. 1982. Effects of pH upon nutrient availability in a commercial soilless root medium utilized for floral crop production. Ohio Agr. Res. And Devel. Center, Res. Cir. 268, pp. 16-19.



INTERPRETATION OF THE ELECTRICAL CONDUCTIVITY VALUES ACCORDING TO THE EXTRACTION METHOD

1:2	SME	POURTHRU	EC	INDICATION
0 - 0.25	0 - 0.75	0 - 1.0	Very Low.	Nutrient levels may not be sufficient.
0.26 - 0.75	0.76 - 2.0	1.0 - 2.6	Low.	Suitable for seedlings, bedding plants and salt sensitive plants.
0.76 - 1.25	2.0 - 3.5	2.6 - 4.6	Normal.	Standard root zone range for most established plants. Upper range for salt sensitive plants.
1.26 - 1.75	3.5 - 5.0	4.6 - 6.5	High.	Reduced vigor and growth may occur, particularly during hot weather.
1.76 - 2.25	5.0 - 6.0	6.6 - 7.8	Very High.	May result in salt injury due to reduced water uptake. Reduced growth rates are likely.
>2.25	>6.0	>7.8	Extreme.	Most crops will suffer salt injury at these levels. Immediate leaching required.

Adapted from: Cavins, T. J., Whipker, B. E., & Fonteno, W. C. (2005, September). Pourthru: A method for monitoring nutrition in the greenhouse. In International Symposium on Growing Media 779 (pp. 289-298).

Most laboratories use the SME extraction method. However, many growers use the PourThru method because it is much simpler and faster to set up. Here are two formulas that allow you to go from an EC value measured by SME to an estimated PourThru value, and vice versa.

$$SME\ EC\ value^{*} = 0.74 \times PourThru\ EC\ value - 0.05$$

$$PourThru\ EC\ value^{*} = \frac{SME\ EC\ value + 0.05}{0.74}$$

*Source: Cavins, T. J., Whipker, B. E., Fonteno, W. C., Harden, B., McCall, I., & Gibson, J. L. (2000). Monitoring and managing pH and EC using the PourThru extraction method. Horticulture Information Leaflet, 590(1), 1-17.

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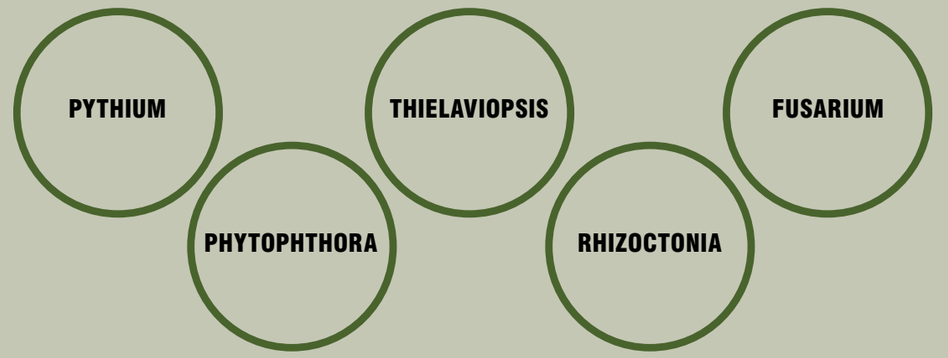
5 COMMON SOIL-BORNE PATHOGENS

The production of high value-added crops pushes growers to maintain more precise control over their environments, which is even more relevant in a context where the aim is to combine local production with increased productivity per unit of area. Today's technologies allow us to produce more on a smaller area, but the downside is that when a problem arises, it can have a major impact much greater than on more extensive production. The goal of this guide is to provide you with some tools to better prevent the emergence of soil diseases.



6 FACTORS INFLUENCING THE DEVELOPMENT OF DISEASES

Fertilization, Ph, salinity of the substrate and water quality

The concentration of soluble salts and pH are the two chemical parameters that you must absolutely monitor since they allow you to detect possible anomalies related to the fertilizers or the water source used.

Lighting

Because of weather variations and climate changes (seasonal or one-time events), it is essential to adjust the amount of light reaching the plants.

Temperature and humidity

Temperature and humidity are two other climatic factors that you need to control in order to achieve optimal plant development.

Irrigation practices

Your irrigation practices can have a big influence on the spread of disease in your greenhouse. The volume, frequency and timing of irrigation are also important and greatly influence the occurrence of soil diseases.

Cultivars

When choosing your cultivars, it is important to identify their susceptibilities to different diseases.

Cleaning and disinfection

Whether it is during the purchase or production of your seeds, cuttings or plants, it is imperative to take all necessary measures to reduce the risk of contamination.

CONTROL YOUR INPUTS: REDUCE RISK THROUGH GROWING MIX SELECTION

by: Stacey Rocklin, grower advisor

With change and uncertainty the theme of the year, how can we prepare for the unexpected? Knowing your inputs and their supply chain can help you make decisions quickly when faced with unforeseen challenges. When choosing a growing media, consider looking for a versatile mix that performs well under various conditions, thus improving your adaptability.

Biological inputs and fertilizer decisions

Knowing more about growing media components and other additions to growing mixes can help you make informed decisions. Consider these two common mix additives: biological inputs and controlled release fertilizers (CRF), which both affect growing media shelf-life. The options include adding these additives directly to the crop during planting or adding them to the growing media. Two key reasons growers prefer to have these blended into their mix are labor shortages to apply them and consistency concerns.

Biological inputs, specifically mycorrhizae, work best when introduced directly to plant roots and are most beneficial to plants with lengthy crop times. They may also interact with the naturally occurring, non-pathogenic microflora of peat moss during storage and transit before first use. However, our industry needs more research on how this impacts their efficacy.

CRFs added as a topdressing at or just after planting fertilize for the entire duration of their expected cycle. Whereas incorporation into the moist environment of a peat mix during storage and shipping risks early nutrient release into the mix, causing a higher starting EC. Even if the incorporated CRF does not release early, roots in individual pots receive nutrients more uniformly when adding CRF as a top dressing. Adding these additives at or shortly after potting results in better growth and cost savings if equipment and labor are available to do the added work (Donald J. Merhaut, 2013).

Understanding the peat characteristics

Peat moss has numerous characteristics that makes it ideal as the main ingredient for growing substrates.

Sphagnum peat fibers have the characteristics of a sponge. **They can absorb up to 20 times their dry weight in water and nutrients**, and release it over time, making it the preferred component of professional growing media. Berger's peat is always consistent thanks to a balanced ratio of different peat sources from multiple bogs as well as a meticulous handling process.

However, not all peat moss is the same. Berger recognizes this and takes extra steps to optimize its production and enhance these characteristics, making sure its products are always uniform and of the highest quality.

Explore solutions with berger experts

Knowing your crop needs and choosing backup mixes as needed to control costs are key abilities growers must continue developing in this market. Working with your knowledgeable Berger Sales Representative and Grower Advisor adds excellent experience and expertise. Back this with growing media research from Berger's R&D team, and you are in an outstanding position to tackle the challenges that come your way.

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Ref: https://www.berger.ca/en/grower-resources/hints-and-tips/control-your-inputs-reduce-risk-through-growing-mix-selection/

GROWING TOGETHER

Berger's Commitment to R&D Grounded in its Customers' Present and Future Needs

The 2019 opening of a state-of-the-art research greenhouse at Berger's headquarters in Saint- Modeste, Quebec, to facilitate product development is just one example of the company's commitment to remain a leader in innovation and quality for the benefit of its customers.

The research greenhouse, which allows for the latest controlled environment horticulture techniques and a plethora of growing systems, is part of a long-term project to strengthen Berger's research and development capacity. The company's investment was a clear statement that Berger, which celebrates its 60th anniversary this year, was "not only committed to the growth of the company, but also to the present and future of its customers," says Chuck Buffington, Berger's Vice President of Sales. "It's about where we're going as a company," he adds.

"For Berger, R&D is critical to its future," says Marc Charland, the company's Director of Research and Development, who adds that **"the facility has allowed Berger to simulate different environments that are closer to the reality of its customers in terms of their production conditions."**

"Ultimately, [the facility] allows us to better understand how our products perform in different environments and tailor them to our customers' needs," adds Pierre-Marc de Champlain, Berger's Director of Product Management and Technical Services. For example, irrigation and fertilization systems include traditional sprinkler or drip irrigation, or nutrient film technique, as well as deep water culture, "a variety commonly found in our customers' facilities," de Champlain adds.

Yanick Coutié, Berger's Vice President of Marketing and Communications, says the company continues to pave the path of research and development it began charting more than 60 years ago, which is closely tied to its vision"To be recognized by the greatest horticultural professionals as THE partner they should work with." According to Coutié, Berger strives to be at the forefront of industry trends, even creating them, by providing uniform, consistent and reliable growing substrates, as well as personalized service and technical expertise.

"We are constantly working on efficiency, consistency, and quality of our products," he says. "Our reputation is based on that." With the company's focus on R&D, coupled with the agronomic and laboratory expertise of other departments, Buffington says his sales team is always equipped with the knowledge to help customers use its products to get the best experience possible.

EXPLORATION

The Elements of Its R&D

"Developing a product involves many steps, the main ones being part of the R&D process," De Champlain explains. First, whatever product is developed must be useful to customers while creating value that is distinctive from the competition, he adds.

Over the years, Berger has introduced many innovations to the industry, some of which are revolutionary. Berger was the first company to offer natural wood fiber products to professional growers in North America. In 1993, Berger introduced the Skyscraper – a now common 110-cubic-foot compressed packaging format, reducing handling labor and cutting packaging waste by nearly 80%.

Berger's R&D team is also conscious of not becoming stagnant. De Champlain says the company maintains the intensity of its R&D activities by also seeking input from employees in other departments, including sales, marketing, technical services, and product management. "Our employees give us an additional perspective on our customers' needs," he adds. R&D also plays an important role in responsible management, and Berger has embraced the concept's three pillars: environmental protection, economic capability, and social equity, Buffington adds. "Reducing our environmental footprint is becoming increasingly important at Berger," he says. "We are using our R&D to help us optimize our current peat resources to ensure the future of the industry. We're also looking at all aspects of social responsibility. "That is why we are committed to using processes and strategies that support environmental, social and economic well-being wherever we operate." De Champlain adds: "Berger makes it a priority to hire locally and reduce its environmental footprint through concrete action. The integration of wood fiber in its products and operations is a prime example of Berger's commitment to ensuring industry's future peat supplies.

Learning From Others

Berger also seeks assistance from other organizations to help make its R&D activities more responsible. For example, the company is Veriflora® certified, an ecolabeling program that assesses responsible peatland management practices that cover peatland opening, harvesting, and restoration or rehabilitation activities that take place after the peatland is closed. Berger has also held ISO 9001 certification since 1996, which ensures the company's operations and processes meet rigorous quality assurance and risk management standards.

Berger attaches great importance to respect for the environment. According to Coutié, the company's participation in various industry alliances is an integral part of research and development because of the shared knowledge such collaboration offers.

Charland agrees, noting that Berger is contributing to the industry development along with researchers and scientists from various colleges and universities. From its top-notch research greenhouse to its skilled employees to its multidisciplinary relationships with outside entities, Berger plans to continue pushing the boundaries of R&D. After all, it's an essential part of the company's lifeblood.

CONTINUED EVOLUTION

Berger looks forward to growing with its current and future customers

While Berger is celebrating its 60th anniversary this year as a family-owned business, company leaders are commemorating the past, but they are looking forward to the future. Executive Vice President Marc Bourgoin, who has been with Berger for 25 years, says the company is laser-focused on continuing to provide its customers with the best growing media with unmatched return on investment, in addition to being a dedicated business partner.

Chuck Buffington, Berger's Vice President of Sales, says the company is focused on its continued evolution. "The customer base we had 60 years ago is different from the base we have today," he adds. "They are much more automated and innovative. They have evolved, and we must evolve with them."That progression has everything to do with being more engaged in the markets it serves, from agriculture to controlled environment agriculture (CEA) to horticulture to floriculture, Buffington says, adding that the company continues to explore new markets.

Yanick Coutié, Berger's Vice President of Marketing and Communications, says the company will continue to put its customers first so it can better understand their needs. Berger customers don't just want quality products, they want the quality service and advice that goes with using those products, Coutié says. "We are evolving as a company, but we're not doing it alone. We're doing it with our customers and our suppliers," he adds.

THE FUTURE

Throughout its 60 years, Bourgoin says Berger has emphasized learning about its customers and the markets it serves to become a better company. "It's in our DNA to improve. We've learned a lot by listening to our customers and establishing relationships with them," he adds. "If they're successful, we're successful." Coutié says Berger employees do not work in silos, which is vital to better understanding customers' needs. "It's not the sales team. It's not the marketing team. It's not the IT team. We're a group," he adds. "We might have different objectives, but we are working together with one focus – the customer."

Customer service isn't just about providing premium and quality products, it's about providing for the whole experience, Buffington says. "It's about being by our customers' side every step of the way. To make sure they have access to all the expertise that comes with every bag of growing media." he adds.

Regular internal communication is a crucial component to adapting to challenging conditions that could impact customers, Coutié stresses. All Berger employees are regularly consulted for feedback and are updated about what's happening inside the company and within the industry, he adds. "It's about making sure everybody is on the same level and understands why they are doing their jobs," Coutié says. "Our employees understand why they go to work every morning, and they appreciate that." If employees understand their roles and the importance of serving the company's customers and creating value for them, the company is in a win-win situation, Bourgoin says. "Over the last 60 years, that has been a key element in our success," he adds.

The evolution and transformation of the industry creates new opportunities where Buffington believes Berger's products can help growers. But it's not just about chasing new opportunities, Buffington says. It's also about embracing the opportunity for continuous improvement. "It's about learning how we can make life better for our current customer base," he adds. "We want to constantly innovate for our current customers to provide continuous improvement of products to them." Coutié says Berger will also continue to be involved with the small communities it serves.

The company currently operates 18 peat moss bogs and nine plants in North America. Berger prioritizes participating in the economy of every community it does business with by supporting its regional suppliers and getting involved in different local initiatives through sponsorships and corporate donations. "We want to be a responsible member of society and continue to extend our local community footprint," Coutié adds.

Berger 60
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THANK YOU FOR YOUR CONTINUOUS TRUST

Our unique world-renowned expertise combined with your desire for a more productive and greener world has allowed us to grow and to make a real difference in what we do together.

HERE'S TO 60 MORE YEARS OF GROWTH!

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