Welcome to our farming guide, where the philosophy of 'Feed the soil to feed the plant' is the driving force. At Botnia Skincare, we hold firm to the belief that the soil is the living heart of our farming efforts. It's a complex, vibrant ecosystem that deserves the utmost care and respect. We believe in fostering the soil's health by enriching it with organic matter. This not only makes nutrients more accessible but also improves soil structure, balances pH, boosts water retention, and mitigates erosion. Our approach is gentle, patient, and mindful, reflecting our respect for nature and our dedication to supporting and nourishing it

Feed the soil to feed the plant”

We believe that the soil is the most important piece of farming. It really is a living ecosystem and therefore we need to treat it as such. It’s imperative to build healthy soil by feeding it organic matter – the partially decomposed fraction of the soil – as this will make nutrients more available, improve soil structure, neutralize pH, increase water capacity, and mitigate erosion. Examples of organic matter applications are compost, manure, green manure, earthworms/earth castings, lawn clippings and other green waste, sawdust, and more.

Composting

While conventional farmers rely on synthetic fertilizers, organic farmers turn to inputs like compost and manure. Composting transforms raw organic materials into a humus-like substance courtesy of our soil microorganisms. The beauty of mature compost is that it stores well, is free of odor, is stable, and is much easier to handle than other fertilizers. We love to use compost as a soil amendment, seed starter, and fertilizer and we use it throughout the year. The process of composting utilizes byproducts of farming (straw, leaves, grass clippings, produce scraps, unused animal feed, etc.) so it’s a form of recycling which is a core value of ours. Other benefits of composting:

- Improves plant growth and health
- Provides organic matter
- Provides plant nutrients in a stable organic form
- Improves soil tilth
- Beneficial microorganisms to improve soil health
- Sequesters carbon
- Increases plant rooting depth
- Improves physical, biological, and chemical soil properties
- Reduces erosion
- Increases water holding capacity and reduces runoff
- Conserves water

No Harsh Chemicals

We do not use any chemical fertilizers or pesticides in our farming. Only a few synthetic insecticides are used as foliar applications, such as soap for controlling soft-bodied

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insects (like aphids) and elemental sulfur for disease and mite control. Clays such as kaolinite and diatomaceous earth can be used as well as botanicals like neem and garlic.

Acceptable chemicals:

- Ethanol and isopropyl alcohols
- Chlorine compounds
- Copper sulfate
- Peracetic acid
- Soap-based herbicides
- Ammonium carbonate
- Boric acid
- Sulfur – such as elemental sulfur and lime sulfur
- Sodium carbonate peroxyhydrate
- Magnesium sulfate
- Sulfates
- Humic acids
- Other micronutrients such as boron, cobalt, copper, iron, magnesium, manganese, selenium zinc, to amend soil based on test results
- Other copper compounds such as copper oxide, copper hydroxide, and copper oxychloride can be used to control plant disease as long as copper accumulation in the soil is minimal
- Potassium bicarbonate
- Hydrogen peroxide
- Lignin sulfonate
- Sodium silicate

Weed Control

Many organic farmers consider weeds to be their single greatest production hindrance. Crop rotation, mulching, and planting competitive varieties are the most successful methods of weed control without the use of herbicides. The practice of crop rotation entails planting different crops on the same plot of land sequentially. Rotating crops improves soil nutrient levels and breaks pest cycles alongside helping with weed pressure. Using straw, leaves, trimmings, or other organic matter like mulch can be successful in smothering weeds and keeping weed seeds from germinating. If livestock are available on larger farm operations, they can also be wonderful weed managers!

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Organic and Heirloom Seeds

We don’t get too hung up on the term “organic” in our farming practices and, rather, favor a regenerative, biodynamic approach. Therefore, we don’t require that all seeds are organic, but whenever possible, we opt for organic seeds. The next layer is heirloom seeds, which we consider the gold standard. Heirloom seeds cannot be altered in a lab or cross pollinated. Rather, they are open-pollinated which means that the plants are pollinated by wind, birds, bees, or other naturally occurring ways. Heirloom seeds have been saved, passed down, and planted through generations for 50 years or more. Because the heirloom seeds produce true-to-type flowers, fruits, and vegetables, you can save the seeds to plant them the following year and still yield the same beautiful result. This way, you won’t need to buy seeds until you decide to plant something different. Therefore we choose to source heirloom seeds for our yearly seed buying; some of our favorite places to source heirloom seeds are:

Baker Creek Heirloom Seeds
True Leaf Market
Seed Savers Exchange
Johnny’s Selected Seeds
Annie’s Heirloom Seeds

Organic no till or limited till

While tilling has been a mainstay in production farming, intensive soil tillage can contribute to soil erosion, nutrient runoff into waterways, and the release of greenhouse gasses into the atmosphere. Reducing how often or how intensely land is tilled allows the soil to retain more organic matter, leaving it less susceptible to erosion and helping it sequester carbon. Generally, less disturbance of soil leads to more organic matter and lower potential for soil erosion and compaction. There is quite a spectrum with tilling as no-till is obviously the least intensive form while conventional tilling is the most intensive. A relatively new method is the organic no-till option, which combines the best aspects of no-till while satisfying the requirements of the USDA organic regulations. It tends to include some tillage in rotation, mainly to help establish the cover crops, but once the cash crops are planted in the spring no further tillage or cultivation is needed. Botnia doesn’t require that our farm partners use the no-till method, but minimal tilling is certainly encouraged.

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Post-Harvest Processing

Once the botanicals are harvested, it is essential that we capture both the constituents and the spirit of each plant as best as we can. Over the years we created a protocol at our microfarm that has worked beautifully for us and ensures that we aren't bringing pests of any kind into our lab (and therefore skincare products) or harboring mold or mildew. While each plant is unique and the drying process can be slightly different for each, we generally dry all of our herbs in hanging or flat racks. For dense flowers like calendula, it is vital to spread them out in a flat layer with good airflow. If possible, setting up the drying racks/hangers in a dark room is ideal, as it prevents the sun from bleaching out the pigments in the plants and/or overdrying them. Before moving onto the bagging of herbs, check that the plants are all dry to the touch and inspect for any mold, particularly in the centers of asters like calendula and chamomile. Next, run through brief organoleptic testing – smell the botanicals, taste them if applicable, and notice if they are bleached or brown. Remove any batches of dried herb that have lost their fragrance (or taste in some cases), are moldy, bleached, or brown and dispose of them appropriately (compost!). Package up the dried herbs in sealed envelopes, jars, or plastic bags and annotate the name of the botanical, date, and the name of the farm on the front of the bag. Once the dried herbs are delivered to Botnia, we will freeze them for a week to ensure that no pests, bacteria, or fungus make it into our lab's herb storage room. Of course, if the plant being delivered to Botnia is fresh, to be used for a hydrosol, please disregard the drying protocol and simply package the fresh herb in a bag or a box for delivery as soon after harvesting as possible.

Thank you for taking the time to explore our approach to farming. We hope that it has provided you with a deep understanding of the principles we hold dear at Botnia Skincare. Our farming methods may be laborious, but the rewards are plentiful - for the soil, for the plants, and ultimately for the skincare products we are proud to create. We strive to work harmoniously with nature, using methods that are sustainable and responsible. This guide is more than a manual; it's a testament to our commitment to nurturing the soil, the plants, and the environment as a whole. By feeding the soil, we feed the plants, and in turn, we nourish ourselves