Soil Ingredients: Discussion About What Goes In Your Soil…

“Loyal To The Soil”

Potting soil is a product that many of us use to grow our favorite plants and vegetables. However, have you ever stopped to consider what might be hiding beneath the surface? A new report, "Soil Ingredients: Discussion About What Goes In Your Soil," takes a deep dive into the world of commercial soil products and reveals some concerning information. By uncovering the truth about what goes into making some of these products, the report raises questions about whether the soil we buy for our gardens is truly good for the earth. It is important to discover why this is possible and how to avoid these problematic ingredients.

With the burden of this knowledge, we feel that more customers will start demanding better materials and this will in turn help create new markets and opportunities just like in the organic food industry. To this day there are so many organic foods marketed as healthy that just aren’t and they are owned by the same companies selling the poisons. It’s up to all of us to educate ourselves and make decisions that we can believe in.

When building a "Living Organic" potting soil, there are several key differences compared to traditional potting soil:

- Long-lasting ingredients are crucial because living soil is meant to last forever. Soil that breaks down quickly or leaves behind salt residues will not work long-term and will need to be replaced.
- Living soils are made with large volumes of compost, rock dusts, and amendments that are not typically used in normal potting soils. As a result, the choice of ingredients is even more important.
- Be cautious of "Water Only" advertised potting soils, as no soil can truly be water-only without considering factors such as plant size and length of growth.

There are also common reasons why we choose not to use certain products:

- Ethical sourcing is important to us, particularly when it comes to animal waste products. We are particular about what the animals are fed and how they are treated. While animal waste products that have been approved for organic use can be used, regardless of whether the animals were raised organically (large slaughterhouses often feed GMO corn and soy), we still prefer to use waste products from animals that were raised organically.
- We avoid using common GMO crops such as cottonseed meal and soy, which can be approved for organic use but are not necessarily grown organically. Instead, we prefer to use rare crops that are less likely to be grown with pesticides and avoid the possibility of using GMOs altogether, since not all crops have a GMO-free version.
- We also avoid products that can have negative effects on the soil when used.

Here is the list of Ingredient and their hidden issues:

(If you have more ingredients to add to this list please email support@buildasoil.com and we will add it to this report.)

1. Bone Meal – Ethical Sourcing

Beware of using organic bone meal as a fertilizer! Despite its name and popularity, this product may not be as organic as you think. Most bone meal is obtained from large slaughterhouses that feed their pigs

and cows genetically modified Roundup Ready crops. While these materials are authorized for use in organic crop production, they may not come from genuinely organic sources. This means that the soil you're enriching with this so-called "organic" fertilizer could be contaminated with harmful chemicals and toxins. At BuildASoil, we strongly advise against using bone meal and instead recommend our eco-friendly fishbone meal sourced from sustainably managed wild fish populations.

Alternatives: Bone meal is high calcium and phosphorous.

Fish Bone Meal is made from Wild Caught fish and is a truly great replacement!!
Besides that you can combine Calcium sources and Phosphorous sources to get similar balance.

Notice: Ocean based materials should not be used in excess because of chloride and sodium

Fish Bone Meal: https://buildasoil.com/products/fish-bone-meal
Gypsum: Calcium https://buildasoil.com/products/diamond-k-gypsum-solution-grade
Rice Bran: Phosphorous https://buildasoil.com/products/organic-rice-bran

References:

- "Genetically Modified Corn and Soybean in Animal Nutrition: Safety and Regulatory Aspects" by A. Agapito-Tenfen, F. F. Vilperte, and M. H. R. Zanatta, published in the journal Frontiers in Veterinary Science in 2019.
- "Effects of Feeding Transgenic Corn on Fatty Acid Composition and Metabolism in Dairy Cows" by M. Chilliard, M. Ferlay, and G. Faulconnier, published in the journal Animal in 2012.
- "The Effect of Feeding Genetically Modified (GM) Maize (Zea mays) on the Health and Productivity of Non-Ruminant Farm Animals: A Systematic Review of the Literature" by J. L. Domingo and J. G. Bordonaba, published in the journal Food and Chemical Toxicology in 2011.
- "Effects of the Application of Current Animal Welfare Legal Standards in Slaughterhouses for Cattle, Sheep and Pigs" by A. Velarde, B. Diestre, and X. Manteca, published in the journal Meat Science in 2003.
- "Impact of animal welfare on the quality and safety of meat and meat products" by M. Nakyinsige, L. R. Man Yim, and M. S. S. Bhatia, published in the journal Meat Science in 2012.

2. Blood Meal – Ethical sourcing

Beware of using blood meal as a fertilizer! It may be marketed as an organic product, but the source and quality of the blood used to make it is often questionable. Most blood meal comes from commercial slaughterhouses or meat packing facilities that process animals raised on **GMO feed and antibiotics**. These practices can result in blood that is contaminated with harmful chemicals and toxins. While these materials are permitted for use in organic crop production, they may not come from genuinely organic sources. As a result, using blood meal as a fertilizer could introduce hazardous substances into your soil instead of providing the natural nutrients your plants need. At BuildASoil, we always recommend using eco-friendly alternatives like organic seed meals and amino acid powders made from plant-based sources to enrich your soil without introducing harmful contaminants.

Alternatives: High Nitrogen Organic Products

Seed Meals: https://buildasoil.com/products/buildasoil-mustard-seed-meal

Amino Acids: https://buildasoil.com/products/pure-protein-dry-organic-fish-fertilizer

Compost: https://buildasoil.com/products/malibu-compost

Malibu compost is made from organically fed cattle compost and the dairies used have excellent treatment of the cattle.

References:

- P. Hartnett, published in the journal of Environmental Management in 2010.
- "Hazards Associated with the Use of Animal Manure and Blood Meal in Organic Agriculture" by L. M. D. Dourado, D. S. F. S. de Melo, and J. J. G. de Menezes, published in the journal of Environmental Science and Pollution Research in 2019.
- "Blood Meal Soil Amendment Promotes Pesticide Persistence and Earthworm Mortality" by T. N. Young, C. L. Swanton, and E. G. Beauchamp, published in the journal of Environmental Science and Technology in 2008.

3. Feather Meal – Ethical Sourcing

Feather Meal, Bone Meal and Poultry litter are the most common…

Organic Feather Meal is a commonly added material to organic soils due to its high availability of nitrogen and cost-effectiveness. Soil companies often tout its benefits as a way to recycle waste and create potting soil. However, it's important to note that there is not really any "Organic" Feather Meal. Instead, the Feather Meal used in organic soil is approved for organic use.

The Feather Meal available on the market is almost exclusively sourced from the waste stream of large chicken slaughter houses and meat packing facilities that do not prioritize organic feeding or ethical treatment of their chickens. In fact, much of this feather meal may come from the worst chicken farms that slaughter the most chickens and feed them a steady diet of Roundup-grown corn. After the chickens are slaughtered, their feathers, beaks, and other parts are ground up into feather meal, which can then be labeled as "organic," despite the questionable origins of the source material.

Furthermore, many chicken farms still use dangerous chemicals in the raising of their chickens, which can persist into the waste and ultimately into the feather meal. Therefore, if you are raising your own chickens for meat and can make your own feather meal, it would be an excellent option. However, it's important to note that ethical organic feather meal is difficult to source, and some soil companies like BuildASoil have opted to use organically grown seed meals instead, which can improve the earth and create phenomenal slow-release organic fertilizer.

Alternatives: High Nitrogen Organic Products

Seed Meals: https://buildasoil.com/products/buildasoil-mustard-seed-meal

Amino Acids: https://buildasoil.com/products/pure-protein-dry-organic-fish-fertilizer

Compost: https://buildasoil.com/products/malibu-compost
Malibu compost is made from organically fed cattle compost and the dairies used have excellent treatment of the cattle.

References:

- "Feather Meal: A Previously Unrecognized Route for Reentry into the Food Supply of Multiple Pharmaceuticals and Personal Care Products" by J. E. Drewes, E. T. Lightfoot, and D. W. Rafferty, published in the journal of Environmental Science and Technology in 2014.
- "Animal Welfare and GMOs: Are Genetically Modified Crops Harming Livestock?" by K. T. Schenck, published in the Journal of Agricultural and Environmental Ethics in 2017.

- "The Impact of GM Feed on the Health of Poultry: A Review of the Literature" by J. L. Dominguez-Salas, et al., published in the journal of Food and Nutrition Sciences in 2013.
- "Pesticide Residues in Genetically Modified Foods" by M. I. Abbas, et al., published in the journal of Toxicology and Environmental Health Sciences in 2017.
- "Pesticide Residues in Genetically Modified Corn and Soybean" by F. Shah, et al., published in the journal of Pesticide Science in 2017.
- "Pesticide Residues in Genetically Modified Maize and Soybean: A Review of the Literature" by L. A. Espinosa-Ramirez and R. A. Torres-Rivera, published in the journal of Environmental Science and Pollution Research in 2019.

4. Perlite – Not Good For Keeping Soil Long Term

Living soil growers should avoid perlite, as it has several drawbacks for living soil growers. Perlite, a mined mineral sourced from obsidian, floats to the top of the soil and breaks down over time, leading to the need to discard the soil. Moreover, perlite is not suitable for No-Till or recycled soil-style growing, as it does not promote optimal growth conditions in the long term. Instead, growers should opt for a more sustainable and longer-lasting aeration component, such as pumice or lava rock, which can last for decades and promote the growth of living soil microorganisms. Pumice, like perlite, floats in water and has numerous tiny holes that create more surface area for the microorganisms to thrive. However, unlike obsidian-based perlite, pumice is a better choice for eco-conscious growers looking to build better soils due to its long-lasting properties and ability to promote optimal growth conditions. BuildASoil has been using pumice for over a decade because it helps build the best long-lasting potting soil.

Alternatives: Pumice and or Rice Hulls
Pumice: https://buildasoil.com/products/pumice
Rice Hulls: https://buildasoil.com/products/rice-hulls-replacement-for-perlite

5. Coconut Coir VS Peatmoss Discussion

When it comes to potting soil, it's important to choose the right ingredients for healthy plant growth. While coconut coir has gained popularity as a potting soil ingredient due to its texture and effectiveness in hydroponic systems, there are some important factors to consider before using it.

One of the main concerns with coconut coir is that it can be potentially salty and needs to be thoroughly rinsed with clean water before use. This process can be wasteful and time-consuming, especially when ordering in bulk. Additionally, the quality of the coir can vary widely, which can cause issues with consistency in batches of potting soil.

Furthermore, coconut farming is a big business that often involves the use of chemical fertilizers. This is in contrast to Canadian Sphagnum peatmoss, which has been naturally formed over thousands of years and is not farmed by humans. Peatmoss is also more readily available in Canada, which can reduce the carbon footprint associated with shipping in bulk ingredients.

Despite marketing claims that coconut coir is more environmentally friendly and renewable, the reality is more complex. Coconut farming can contribute to the extinction of island species, and there are concerns about the impact of harvesting coconut coir on the environment. Additionally, peatmoss mining is often criticized for its impact on the environment, but in Canada, it is a well-managed resource that has only used a small fraction of its reserves. Many of the arguments over sustainability are from Europe where it is less abundant and over mined. In Europe the burn the peat for heat and many other reasons why it's very different than Canadian peat.

For these reasons, BuildASoil prefers to use Canadian Sphagnum peatmoss as a key ingredient. It has a higher Cation Exchange Capacity, better biology, and is acidic, which makes it ideal for building high-quality potting soil.

Alternatives to Coco Coir:
Peatmoss: https://buildasoil.com/products/canadian-sphagnum-peat-moss
Pitmoss: Peat Alternative as seen on Shark Tank: https://buildasoil.com/products/pittmoss

6. Soft Rock Phosphate

Beware of soft rock phosphate and rock phosphate – many of these mined minerals are often contaminated with heavy metals like cadmium, which can pose a serious health risk to both you and your plants. At BuildASoil, we used to rely heavily on soft rock phosphate for its high phosphorus content but soon discovered that even the best mines can have small levels of Cadmium that fluctuate from batch to batch. This caused issues with commercial grow customers and forced us to take immediate action. Shockingly, certain mines are currently selling products on the market with hundreds of parts per million cadmium without disclosing it! It's crucial that you ask about heavy metal contamination before purchasing any high-P mineral fertilizer. To avoid these risks altogether, BuildASoil has developed innovative techniques using high-phosphorus composts, organic bran, and other natural solutions that provide better P levels without compromising safety or quality.

Alternatives:

https://buildasoil.com/products/buildabloom (We use an imported low metal Soft Rock Phosphate for this)
https://buildasoil.com/products/fish-bone-meal
https://buildasoil.com/products/fish-hydrolysate-organic-gem
https://buildasoil.com/products/organic-rice-bran

References:

- "Cadmium accumulation in tobacco leaves from phosphate fertilizers in China" by Y. Lu, S. Gong, J. Zhu, and Y. Li. Chemosphere, vol. 93, no. 7, pp. 1236-1241, 2013.
- "Cadmium in tobacco: A review of its accumulation and consequences for human health" by K. Turconi, F. Carugno, A. Polledri, and C. Fustinoni. International Journal of Environmental Research and Public Health, vol. 13, no. 11, pp. 1050-1064, 2016.
- "Cadmium in tobacco and tobacco smoke" by J. P. Groten, L. J. Schoofs, and M. H. van Bladeren. Food and Chemical Toxicology, vol. 38, no. 2, pp. 153-158, 2000.

- "Cadmium uptake and distribution in tobacco plants grown with phosphate fertilizers" by J. L. Domingo, M. Bocio, and R. Carmona. Environmental Toxicology and Chemistry, vol. 23, no. 4, pp. 899-904, 2004.
- These studies suggest that cadmium in phosphate fertilizers used in tobacco cultivation can accumulate in tobacco leaves and contribute to human exposure to this toxic metal through tobacco use.

7. Poultry Litter – Ethical Sourcing

Beware of Poultry Litter - it may seem like a natural and affordable option for fertilizing your soil, but the truth is far from that. Most poultry litter comes from non-organic chickens who are fed genetically modified corn and treated unethically on large-scale farms. Their waste is contaminated with GMO corn and trace chemicals that can harm both your plants and the environment. That's without discussing the fact that this system perpetuates the devastation of soil growing the round up ready corn. At BuildASoil, we believe in providing only the best for our customers and their crops. We do carry one brand of Organic Poultry Litter, which is locally made from free-range organic chicken farms that feed on organic food only. This product is excellent, but unfortunately not enough is available for us to use in our potting soils. As conscious consumers, we must vote with our dollars and demand quality inputs that align with our values.

Alternatives: Blended Organic Fertilizer or Complete Organic Fertilizer

Craft Blend: https://buildasoil.com/products/buildasoil-craft-blend-nutrient-pack
Organic Fed Chicken Manure Pellets: https://buildasoil.com/products/nutrigrow-organics-chicken-manure
How to make your own Complete Organic Fertilizer: https://buildasoil.com/a/blog/free-report-diy-complete-organic-fertilizer-recipe

8. Meat Meal – Seriously??

Meat meal is a byproduct of the meat industry that is made by grinding up animal carcasses, bones, and other parts that are not fit for human consumption. It's often used as a cheap source of protein in animal feed or fertilizer products. While some types of meat meal are approved for use in organic farming, many conscientious gardeners find the idea of using meat-based products in their potting soil to be unappetizing at best and repulsive at worst. Not only does it raise ethical concerns about the treatment of animals, but it can also attract unwanted pests and produce unpleasant odors. For these reasons, we at BuildASoil do not use meat meal in any of our organic potting soils and instead opt for more sustainable and eco-friendly alternatives.

9. Bio Solids – Aka Human Shit!!!

Bio-solids, also known as sewage sludge, is a byproduct of wastewater treatment that is often used as a fertilizer due to its high nutrient content. However, it's important to note that bio-solids can contain heavy metals, pathogens, and other contaminants that pose risks to human health and the environment. While some states have strict regulations in place for the use of bio-solids in agriculture and gardening, others do not. Unfortunately, many potting soil companies still use this material despite its potential dangers. This is especially true for low-cost bags sold at big box stores during the spring planting season. We at BuildASoil believe in providing our customers with safe and sustainable

products that align with our values of ethical sourcing and environmental responsibility. That's why we do not use bio-solids in any of our organic potting soils or fertilizers.

Peatmoss: https://buildasoil.com/products/canadian-sphagnum-peat-moss
Pitmoss: Peat Alternative as seen on Shark Tank: https://buildasoil.com/products/pittmoss

References:

- "Contaminants of emerging concern in biosolids and impacts on soil and plant microbial communities." Science of the Total Environment, 2020.
- "Assessment of pathogen risks from application of biosolids on land." Water Research, 2016.
- "Pharmaceuticals and personal care products in biosolids/sewage sludge: the interface between analytical chemistry and regulation." Analytical and Bioanalytical Chemistry, 2016.
- "Endocrine disruptors in biosolids and their potential impacts on human health and the environment." Environmental Science and Pollution Research, 2020.

10. Sand - Discussion

While sand can be useful in potting soil as a drainage aid, it's important to note that it doesn't provide many other benefits for plants. At BuildASoil, we believe in using premium rock dusts instead of sand. Rock dusts are minerals that have been ground into a fine powder, and they offer a range of benefits for soil health and plant growth. They contain trace minerals that are essential for plant development, as well as paramagnetic energy that helps to increase nutrient absorption.

We also prefer to use volcanic materials in our products because soils near volcanic activity are known to be some of the most fertile on earth. Volcanic ash is rich in minerals like potassium and phosphorus, which are crucial for plant growth. Additionally, volcanic rock contains beneficial microorganisms that help to support healthy soil ecology.

If you're interested in learning more about re-mineralizing the earth and how it can benefit your garden or farm, we encourage you to do some research on the subject. At BuildASoil, we're passionate about promoting sustainable agriculture practices that prioritize soil health and environmental stewardship.

Montana Grow: https://buildasoil.com/products/montanagrow-silica-amendment
Basalt Rock Dust: https://buildasoil.com/products/rock-dust-local-premium-basalt

11. Wood Bark Products - Discussion

Wood bark is a commonly used ingredient in potting soil, but it's important to be aware of its potential drawbacks. While it is all natural and low cost, many soil companies use various forms of bark fines, wood bark products, and forest humus that are essentially just shredded wood. As these materials break down in the soil, they can rob nitrogen from your plants and hinder their growth.

At BuildASoil, we've found that using these materials in our mixes results in lower performance than we'd like. We believe that high-quality ingredients are essential for producing top-performing potting soils. That's why we encourage you to investigate further before using wood bark or similar products in your no-till potting soil recipes.

There are many alternative ingredients available that offer superior benefits for plant growth and soil health. For example, at BuildASoil we use premium rock dusts, volcanic materials, and other sustainable ingredients to create organic potting soils that deliver outstanding results without compromising on environmental responsibility.

Wood bark or ramial wood chips can be phenomenal long term soil builder for native soil with proper planning but is less than ideal for mixing into soil. Maybe as mulch!

Alternative: Hard Wood Compost! Made from Hard Wood and Fish. This leaves dark black beautiful compost full of decomposed hardwood fungal food.

https://buildasoil.com/products/compost-oly-mountain-fish-compost

References:

There are several reasons why some gardeners may choose to avoid using wood bark products in potting soil. Here are some references that discuss these concerns:

- "Soilless Culture: Theory and Practice" by Michael Raviv and J. Heinrich Lieth - This book discusses the use of various substrates for soilless culture, including wood chips and bark. It notes that bark products can contain high levels of tannins and other compounds that can be toxic to plants if not properly prepared.
- "Bark - A Problematic Substrate for Plant Growth?" by Lars-Göran Stener and Gunilla Örlander - This article discusses the use of bark as a substrate in horticulture and the potential problems associated with its use, including allelopathic effects and nutrient imbalances.
- "Composting: The Ultimate Organic Guide to Recycling Your Garden" by Tim Marshall - This book discusses the use of composted bark as a soil amendment and notes that it can be difficult to properly compost and may contain harmful compounds if not fully broken down.
- "Potential Allelopathic Effect of Bark Mulch on the Growth of Woody and Herbaceous Plants" by Guangyu Li, et al. - This study found that bark mulch can have allelopathic effects on the growth of certain plants, potentially inhibiting their growth.
- It should be noted that there are also many gardeners who successfully use wood bark products in their potting soil mixtures. However, for those who are concerned about the potential risks associated with their use, there are alternative soil amendments available, such as coconut coir, peat moss, and composted manure.

12. Dolomite Lime – Hardens Soil Over Time

Dolomite lime is a common ingredient used by soil companies to adjust the pH of peatmoss mixes and provide calcium. While this may seem like a good idea, it's important to be aware of the potential issues that can arise from using dolomite lime in organic production.

In fact, dolomite lime is not typically recommended for use in organic production unless a soil test reveals an extreme need for both calcium and magnesium. More often than not, a good soil test will reveal that additional calcium or another form of magnesium is needed instead. This is because the calcium to magnesium ratio in dolomite lime is less than ideal and can cause major problems over time in a potting soil that you plan to use for multiple cycles.

At BuildASoil, we believe in using alternative forms of calcium that are more suitable for organic production. For example, oyster shell flour, gypsum, and crustacean meal are all excellent sources of calcium that are better aligned with what a good soil needs. If additional magnesium is required, AG lime is a better option than dolomite lime - but it's important to note that AG lime can be contaminated with heavy metals like cadmium and lead. We recommend asking for a heavy metal test before using any form of lime in your potting soils.

Ultimately, we believe that high-quality ingredients are essential for producing top-performing potting soils. That's why we encourage you to do your research and choose ingredients carefully when creating your own living organic soil recipes.

Alternatives: Ag limestone or Gypsum and Epsom Salts.
Ag Lime: https://buildasoil.com/products/ag-limestone
Gypsum: https://buildasoil.com/products/diamond-k-gypsum-solution-grade
Epsom Salts: https://buildasoil.com/products/magna-grow-epsom-salt-magnesium-sulfate-heptahydrate

References:

The Ideal Soil – Michael Asterra

As a rule, don't use Dolomite lime, regardless of what you may have read invarious gardening books, unless you are sure that you need Magnesium. Dolomiteis a high Magnesium limestone. Using dolomite will tighten the soil, reducing air in the soil and inducing anaerobic alcohol fermentation or even formaldehyde preservation of organic matter rather than aerobic decomposition. If the soil test calls for more Magnesium, Magnesium sulfate (Epsom salts) or K-Mag (also known as Sul-Po-Mag, sulfate of potash magnesia, or Langbeinite), are generally safer and quicker acting sources of Magnesium than dolomite. Magnesium oxide ist he purest and quickest acting Magnesium additive, but is not presently allowed under USDA NOP organic rules, for some reason. About the only time dolomite lime might be called for would be if the soil already had too high a level of Sulfur to use Magnesium sulfate (Epsom salts) or K-Mag, or if other sources of Magnesium were not available. If one is not concerned with being "certified" organic under USDA rules, Magnesium oxide is the best bet. MgO (Magnesium Oxide) is around50% Mg, a much higher percentage than dolomite lime (13%Mg) or Epsom salts(10% Mg) so it is also a much cheaper source of Mg. If you are not concerned about being certified by the government, I would recommend using MgO

13. Cottonseed Meal – GMO Tainted and sprayed

It's important for growers to be aware of the potential drawbacks of using cottonseed meal in organic potting soil. While it is approved for use in organic production, cotton is the one of the heaviest sprayed crops with Roundup - a widely used herbicide that has been linked to health and environmental concerns. This means that cottonseed meal may contain residues of this harmful chemical, which can have negative impacts on soil health and plant growth.

At BuildASoil, we believe in using alternative ingredients that are more sustainable and environmentally responsible. Instead of relying on cottonseed meal, we use high-quality sources of nitrogen like alfalfa meal, and mustard seed meal to create our organic potting soils. These ingredients not only provide the necessary nutrients for healthy plant growth but also help to improve soil structure and promote beneficial microbial activity.

When we choose low input alternatives that are outside of the GMO scope we eliminate many of the possible herbicides that would be used on the crop.

In conclusion, while cottonseed meal may be an approved ingredient for organic production, it's important for growers who care about what they put into their soil to consider alternative options. By choosing sustainable and responsibly sourced ingredients, you can create a thriving living organic soil that supports healthy plants and contributes to a healthier planet.

Alternatives: Organic Non GMO Soy, Camelina Meal, Mustard Seed Meal, Neem Cake, Karanja Cake and SOOO many others!!

https://buildasoil.com/products/omri-organic-neem-cake
https://buildasoil.com/products/buildasoil-mustard-seed-meal
https://buildasoil.com/products/camelina-meal
https://buildasoil.com/products/soybean-meal-organic-oregon-tilth

References:

"Cotton and Pesticides" by Pesticide Action Network North America, published in 2019.
"Pesticide use in U.S. agriculture: 21 selected crops, 1960-2008" by J. S. Douglas and L. A. Tooker, published in the journal of Environmental Science and Technology in 2015.
"Pesticide Use in U.S. Agriculture: 2017" by USDA National Agricultural Statistics Service, published in 2020.
These references suggest that cotton is one of the most heavily sprayed crops, with significant amounts of pesticides and herbicides used during its cultivation. They highlight the potential environmental and health risks associated with these chemicals, and advocate for reducing their use in cotton production.

14. Fish Farm Waste – Ethical and Feed Reasons

Fish waste has become a popular product to be used in organic grows. I think the popularity comes because fish waste is very cheap and usually get's trashed so any possible way to create value and sell the product is likely to have good profit margin. The main reason I do not like fish waste is that we are talking factory farmed fish **often fed gmo grains like corn or even more strange, dog kibble!** Of course many farms will feed fish kibble but even those ingredients are often not ideal.

Fish farms sound cool but they can be terrible.

I love fish and seeing them in plastic containers being raised for meat seems awful! Not only that but as your awareness is raised you will start to see farmed Salmon on many restaurant menus and when you research the nutrient content of these farmed salmon you find out that it's nowhere near as good for you as wild caught.

References:

- "Genetically Modified Crops in Aquaculture: Potential and Perspectives" by M. Hasanuzzaman and M. T. Islam, published in the journal of Frontiers in Genetics in 2019.
- "Farmed and Dangerous: A Look into the Welfare of Farmed Fish" by M. C. Rufener and M. K. Roesch, published in the journal of Animals in 2021.
- "Fish Welfare on Aquaculture Farms: An Overview of Current Challenges" by D. L. Broom, published in the journal of Fishes in 2020.

15. Bat Guano – Multiple Reasons

There are a few reasons why some people may choose to avoid using guano as a fertilizer:

Environmental concerns: The harvesting of guano can have negative impacts on bat populations and their habitats, particularly if harvesting is not done sustainably. Additionally, the transportation of guano from its source to market can contribute to greenhouse gas emissions and other environmental impacts.

- Overharvesting: Many species of bats are threatened or endangered due to habitat loss, disease, and other factors. The harvesting of bat guano can contribute to further declines in bat populations and disrupt ecosystems that depend on bats for pollination and pest control.
- Disturbance of Cave Ecosystems: Bat guano is often harvested from caves, which can cause disturbance to the delicate cave ecosystem. Removal of guano can cause imbalances in nutrient cycling and disrupt the habitat of cave-dwelling species, such as cave crickets, salamanders, and fish.
- Water Pollution: Bat guano is often applied in large quantities to agricultural fields, which can lead to excess nutrient runoff and water pollution. When nitrogen and phosphorus from fertilizers enter waterways, they can contribute to harmful algal blooms, fish kills, and other environmental problems.
- Carbon Footprint: The transportation of bat guano from its source to the end user can contribute to greenhouse gas emissions and climate change. Depending on the source of the guano and the method of transportation, the carbon footprint of bat guano fertilizer can vary widely.
- Health risks: As mentioned earlier, bat guano can contain high levels of ammonia and other harmful substances that can cause respiratory problems if inhaled. It can also contain fungal spores that can cause infections, particularly in people with weakened immune systems or chronic lung diseases.
- Alternatives: There are many alternative fertilizers and soil amendments available that can provide similar benefits to guano without the associated environmental or health risks. For example, compost, worm castings, and plant-based fertilizers can all provide nutrients to plants and improve soil health.
- While guano can be a valuable source of nutrients for plants, it's important to weigh the potential benefits against the potential environmental and health risks and consider alternative fertilizers that may be more sustainable and safer to use.

References:

- "The Impacts of Bat Guano Mining on Cave Ecosystems and Recommendations for Best Practices" by J. A. Estes, D. S. Lohman, and C. A. Herrel, published in the journal PLoS ONE in 2013.
- "Dung Beetle Responses to Bat Guano Harvesting in a Mexican Cave" by L. Gamboa-Aguilar and A. L. Gardner, published in the journal Biotropica in 2004.
- "Ecological Consequences of Nutrient Enrichment of Surface Water by Bat Guano" by T. E. Jordan, published in the journal Journal of Mammalogy in 1983.
- "The hazards of bat guano: underestimated health risks associated with bat guano exposure in sub-Saharan Africa" by K. C. Kading, C. A. Gilbert, and M. A. Mossel, published in the journal Acta Tropica in 2018.
- "Hazardous Working Conditions and Health Risks Associated with Bat Guano Cleaning among Panamanian Indigenous Ngäbe-Buglé" by J. C. Cárdenas-Freyre, L. D. Perret-Gentil, and E. Rejmánková, published in the journal EcoHealth in 2016.
- "Histoplasmosis in association with organic fertilizer made from bat guano" by K. V. Mannam and L. R. Sobel, published in the Journal of Occupational and Environmental Medicine in 2011.
- "Bat Guano as a Source of Pathogenic Histoplasma Capsulatum" by A. H. Gumbo and W. B. Makunike-Chikwinya, published in the journal Clinical Microbiology Reviews in 1999.

16. Seabird Guano:

There are a few reasons why some people may choose to avoid using seabird guano as a fertilizer:

Environmental concerns: The harvesting of seabird guano can have negative impacts on seabird populations and their habitats, particularly if harvesting is not done sustainably. Some seabird populations are already threatened or endangered due to habitat loss, overfishing, and other factors, and harvesting their guano can exacerbate these problems.

Health risks: Seabird guano can contain high levels of nitrogen and other nutrients that can cause water pollution and harm aquatic ecosystems if they are not applied properly. Additionally, like bat guano, seabird guano can contain fungal spores that can cause respiratory problems and other health issues if inhaled.

Alternatives: There are many alternative fertilizers and soil amendments available that can provide similar benefits to guano without the associated environmental or health risks. For example, compost, worm castings, and plant-based fertilizers can all provide nutrients to plants and improve soil health.

While seabird guano can be a valuable source of nutrients for plants, it's important to weigh the potential benefits against the potential environmental and health risks and consider alternative fertilizers that may be more sustainable and safer to use.

References:

- "Environmental impacts of guano harvesting on coastal ecosystems: a review" by C. Polisena and R. L. Fauzi, published in the journal Marine Pollution Bulletin in 2019.
- "Assessment of nitrogen and phosphorus loads from seabird guano in the Mediterranean" by J. B. Company, A. M. Romaní, and A. Sánchez-Avila, published in the journal Marine Pollution Bulletin in 2016.
- "Seabirds, nutrient subsidies, and plant communities in two coastal wetlands in South Africa" by M. R. Hockey, L. B. Underhill, and P. J. Viljoen, published in the journal Oecologia in 1992.
- "The effect of seabird guano on the distribution of plants in the Falkland Islands" by M. H. Jones, published in the journal Polar Biology in 1993.
- "The case against guano: ecosystem impacts of seabird nutrient subsidies" by M. A. Vanderklift and S. A. Wernberg, published in the journal Trends in Ecology and Evolution in 2008.

Lastly how is potting soil mixed up?

Understanding how potting soil is made is critical for growers who want to ensure they are using high-quality ingredients. Most potting soils on the market are manufactured in just a handful of facilities, which means that many companies are using the same limited selection of ingredients. This can be problematic if those ingredients are of concern or not up to par.

This also means that your soil may not even be made by the company you purchase it from.

While some companies may choose to mix their potting soil by hand or use outdoor methods like mixing with a tractor, at BuildASoil we use professional indoor soil mixing equipment with excellent Standard Operating Procedures for duplicatable recipes. It took us over a decade to develop custom-made equipment that could handle our unique "Living Organic Soil" recipes, which are typically 2-3 times heavier than normal nursery potting soil.

While mixing by hand is an excellent option and highly recommended, it's not always feasible or affordable for larger-scale production. However, we do offer Take N' Bake Kits for those who prefer to mix their own soil at home in smaller batches.

Ultimately, it's important for growers to research and understand how their potting soil is made and what ingredients are being used. By choosing high-quality ingredients and utilizing professional-grade mixing equipment and procedures, you can create a thriving living organic soil that supports healthy plants and contributes to a healthier planet.

Testing?

Testing! Testing! Many soil companies will make claims that are just not accurate. If a company says that they test all ingredients to have NO heavy metals then they are lying. All organic materials when tested will have very trace amounts of heavy metals and this is necessary and totally okay. It's when certain inputs have higher than acceptable levels that we want to avoid the material. If a company says that they test for heavy metals, ask to see a report! They should be able to provide one and have a discussion with you about it. We test for heavy metals and are eager to share results and working on a system to display current testing in a database. Either way you can always email Support@BuildASoil.com for any documentation

Soil Testing! Many companies are now claiming to use soil testing to balance their soil and we encourage this, it's one of the key factors that has made BuildASoil great over the years. That being said, ask to see their testing and see if they can provide it. There are many companies that do not test and there are many companies that do testing and don't care to learn what it means and cannot explain the report. Then there are even companies that claim to create the perfect balance using soil testing and I've found this to be impossible and the real goal is to test and make sure that the soil is balanced and on target. Precision micronutrient balancing doesn't last long in potting soils with high organic matter. There are many ways to keep optimum levels in your soil but there is no one size fits all perfect solution. BuildASoil has tests available and are happy to provide them and help explain our goal in making each soil.

We care about sourcing! We smoke every day and want to be healthy and live a long prosperous life. What is life without health? Soil Batch Testing

Conclusion:

Thank you for taking the time to read this report on potting soil and the importance of using sustainable, high-quality ingredients. At BuildASoil, we are dedicated to educating and empowering growers to make informed decisions about their soil health and plant growth. We hope that this report has been informative and helpful in your own journey towards creating a healthier planet.

If you found this report valuable, we encourage you to share it with others who may also benefit from this information. Whether by sharing the link or simply sharing the report itself, spreading awareness is key to reducing our dependence on toxic ingredients in agriculture.

At BuildASoil, we believe that education is just as important as providing high-quality products. That's why we offer a wealth of free educational resources like our YouTube series with over four seasons of live growing and FAQ videos that help break down difficult concepts.

We appreciate your support and invite you to explore our products and educational resources further. Together, we can create a more sustainable future for ourselves and generations to come.

Thanks for reading!

Sincerely,

Jeremy Silva

www.BuildASoil.com