GROW CLIMATE SOLUTIONS

WITH CLIMATE VICTORY GARDENING

Slide: Intro

I'm excited to talk about gardening and the huge potential to create change on so many levels. And, when I say different levels, I mean that quite literally, because we'll cover everything from tiny soil organisms to the climate of our entire planet in the next half hour.

I'll focus a lot on the climate, because 70 percent of Americans are worried about the climate and around half of Americans feel helpless in the face of a climate crisis. But, I love knowing that my garden can move the dial a little bit on this problem that can otherwise feel enormous and overwhelming.

I also want to acknowledge that the corona virus is an enormous and overwhelming issue that's likely at the front of everyone's minds but want to remind folks that gardening has so many health and stress benefits. And, we can take advantage of our ability to provide for ourselves and our community.

I hope you come away from this webinar with some optimism.

Slide: Overview

This webinar will be centered around the idea of Climate Victory Gardening: what it is, why it's important, and how it works. Quick note: there's no such thing as an exact template that's going to work for everyone. We're all gardening in different places, under different conditions. Instead, the goal of this webinar is to give you an understanding of the concept, to inform the hundreds or even thousands of decisions you make in your garden each season. Think of it as a diving board to launch into a new way of thinking about gardening rather than a prescription or exact how to.

Slide: Why Climate Victory Gardening?

We came up with the idea of Climate Victory Gardening because we were so inspired by the Victory Garden campaigns during the World Wars, which were a way for people to contribute to the war, when many farmers became soldiers and when a lot of food was being sent to support troops.

Slide: 1944

By 1944, there were around 20 million Victory Gardens producing 40% of the fresh fruits and vegetables consumed in the US at that time. It's really incredible to think about; that's almost half of our food supply, and it's really different from our food system today.

Victory Gardening was a great example of the huge potential of collective action. Gardens were a force for change then, and we want to make that happen again, this time focused on the climate.

Slide: Why the climate?

So, why are we focusing on the climate? The research is out there and it's pretty scary. Some reports say that we only have 12 years to meaningfully address the climate crisis. It's also said that we may only have around 50 years of agricultural topsoil left to grow food. At the same time, our food system is emitting around 1/3 of the world's greenhouse gases. New research from this month shows that agriculture and land use are as polluting as power plants.

Here's an important point: we know we need to slow the pollution we're emitting into the air, but there's already too much carbon up there in the atmosphere, so we also need a way to pull carbon out of the air if we're going to stop the climate crisis. The good news is that research shows that agriculture is a great way to do both—pull carbon out of the air and slow emissions—and we can do both in our gardens. I'll be talking about reducing emissions and carbon sequestration quite a bit in the rest of the webinar. This intersection of food and climate is a good place to be, and it's a place we can exercise our decision-making power, every time we eat or work in the garden.

Green America is working with large farms and companies to do this as well, but change at the large scale can take time, which is why we're asking gardeners to be trail blazers in their own backyards to get this idea out into the world ahead of the curve, before climate-positive food is something that's widely available at the grocery store.

Slide: 2 Types of Climate Solutions

There's two ways to think about climate solutions in our gardens.

The first is to maximize soil protection within our gardens, because this is where we're going to be capturing carbon: pulling it out of the air and storing it underground. And when I say carbon, I'm talking about the carbon that's in carbon dioxide, which is a powerful greenhouse gas and a big cause of climate change.

The second solution is all about minimizing climate impacts beyond the boundaries of our gardens and making decisions that help reduce emissions. An example might be that if you don't buy chemical fertilizers from a store, you're reducing pollution and emissions that would have come from a truck transporting that fertilizer from the factory to the store. I'll cover a few more examples in the next slides.

Slide: Close the Loop

One way to think about applying both climate solutions is to close the loop in our gardens. That means building healthy soil using what we have on hand, instead of buying chemical fertilizers and pesticides. We're also trying to reduce wastes coming from our gardens, because both have carbon and climate impacts.

The graphic is a good example. We're growing plants, which pull nutrients from the soil. The food passes the nutrients along to us, and we're responsible for returning nutrients to the soil with composting so the process can happen all over again. Carbon has a role in each step of this process.

Or, you might think of a bubble around your property, from the height of your tallest tree down to your deepest roots. Imagine all that happens there and what you can do to support natural processes and soil health using what you have. How can you minimize anything going in or coming out of this loop or this bubble? When we garden in this way that closes in the loop and puts soil health first, we're helping the climate.

Slide: Soil Health

Let's talk more about soils and carbon, and what's actually happening in our gardens. You might have heard that a single teaspoon of healthy soil has billions of microorganisms. These are the workhorses we're harnessing to pull carbon out of the air. I'll use the words microorganisms and microbes interchangeably to talk about life in the soil—including everything from earthworms to beneficial bacteria, fungi, and others.

Today, in industrial agriculture, soil is actually source of carbon emissions because of how badly it's treated. These organisms are being altered and killed by chemical inputs, which releases carbon into the air. But, under good management, soil and these microorganisms can hold huge amounts of carbon; soil is the largest carbon sink on the planet behind oceans. We just have to grow food the right way.

Slide: Plants

How do we get carbon from the air to the soil? The answer is through plants. This is something they do naturally. This is a little technical, but you definitely don't have to be a scientist to be a Climate Victory Gardener. That said, understanding some of this basic science will help you make the best decisions in your garden. Alongside scientific explanations, I'm also going to do my best to connect to something you might have seen or experienced in your garden.

On this slide, we're zoomed in now to talk about how plants actually grab carbon from the air. And after that, we'll zoom back out to talk about the practices we can use in our gardens to encourage plants to do this.

This image might look familiar, but the last time you saw it might have been in grade school. Can you guess the name of this process? This is how plants grow. They use the sun's energy, water, and carbon dioxide to create sugars. Plants are taking carbon dioxide out of the air and creating food or carbohydrates (notice the base word is carbon). They're using this food to grow themselves and feed the soil life that provides the plants with nutrients. The plants release oxygen as a byproduct. This is why humans are able to exist on earth, because plants create fresh oxygen for us. They breathe in carbon dioxide and out oxygen.

Slide: Photosynthesis

The answer is photosynthesis. All gardeners know about this process intuitively: plants need sun, water, air, and healthy soil. It's the carbon that might be new to folks.

Slide: Soil

Carbon is something we often think of as bad, because we associate it with our changing climate. But, it's the basic building block for all life. In the atmosphere as carbon dioxide, carbon creates a greenhouse effect that heats our planet, but plants use carbon to create cells to grow and feed microorganisms in the soil that support them.

It's the carbon that goes into the soil through plants that has the biggest potential for change. Those billions of microorganisms? They represent a quarter of Earth's biodiversity. This is where we want to get the carbon, because it's more likely to stay underground and it helps our gardens grow. Again, you don't have to be a scientist to know this. Many gardeners are well acquainted with carbon in healthy soils, but might recognize it as organic matter, the crumbly texture, or its rich, earthy smell. From this, we learn that, soil health is both integral to addressing the climate crisis and having a successful garden.

Slide: Methods

Now we're going to zoom back out and talk about our role in this process as gardeners.

Slide: Methods Overview

I'm going to cover 10 methods or gardening practices, and I'm going to focus on how they build healthy soils and address climate issues, both within and beyond the boundaries of our gardens. If you're not sure how to do any of these practices, it's best to find localized advice from Master Gardeners or extension agents in your area. Or do some research online.

We don't expect everyone to be able to do all these things; some will be easier to adopt than others, like covering your soils or ditching the chemicals. It depends on where you're gardening. But, chances are, if you're a gardener, you're probably already do some of these things.

Slide: 1 Grow Edible Plants

Let's start simple: grow food. When possible, grow food plants instead of grass or ornamentals. There are climate benefits. When we grow food, plants pull carbon out of the air like we saw in the photosynthesis slides. We're also reducing emission from other parts of the food system like trucks moving food from farms to the grocery store. And we know exactly how this food was grown whether any synthetic pesticides or fertilizers were used.

Slide: 2 Keep Soils Covered

I think this is the most important step in improving soil health. And, when I say keep soils covered, think physically covered. We can do this lots of ways: mulch, plant cover crops, or we can even allow weeds strategically. When you cover the soil, we don't have to water as much because it's not as exposed. This reduces erosion, keeps topsoil, and protects microbes in the soil so they're better able to keep carbon underground. We're also reducing emissions by using yard wastes that otherwise would emit methane gas as they decompose in the landfill. This is a good example of how we can use one method to both slow down emissions and pull carbon down at the same time.

Slide: 3 Compost

Composting is one of our strongest tools in building soil. We're taking organic materials and exposing these to microorganisms to create a strong fertilizer that builds soil communities and can even make the food we grow more nutritional. Again, we're reducing emissions from landfills. And, by not using store-bought fertilizers, we also eliminate the emissions associated with the mining and production of these commercial products. Compost feeds life in the soil for long-term benefit, and happy microorganisms keep carbon underground, stabilize it in the soil and use it to build their own cells for growth just like plants do in photosynthesis.

Slide: 4 Encourage Biodiversity Above and Below Ground

We want to encourage biodiversity above and below ground. Think about building diversity in crops and soil. Diverse plants support diverse soil life and make our gardens beautiful. This helps us diversify our diets, create habitat for pollinators, balance ecosystems, and keeps pest in check. Compost like we just discussed is a good way to increase diversity. Also think about root diversity of the crops you're growing, because we want to feed organisms and store carbon at different levels of the soil. Diverse soil life is more likely to keep soil carbon underground and reduces need for things like pesticides and fertilizers.

Slide: 5 Plant Perennials

Perennials are also a good way to add diversity to our gardens. Perennials include trees, most berries, a lot of herbs, asparagus—what grows as a perennial really depends on where you live. But, with perennials, you plant them once and they grow for many seasons, which is good for you because it's less work, and it's good for your soil because it's not being dug up and

disturbed so often. With less soil disturbance, microbes in the soil can do their job of holding onto carbon better. Perennials also form deep roots, so they may store carbon farther underground. They often require fewer inputs because of their hardiness and ability to access nutrients deeper in the soil.

Slide: 6 Ditch the Chemicals

This refers to synthetic, or chemical-based, store-bought herbicides, pesticides, and fertilizers. These kill beneficial organisms in the soil. And more organisms there are, the more likely the soil is to hold carbon and keep it out of the air. Instead of chemicals, we can fertilize with compost like we saw in the close the loop slide, plant companion crops, and use integrated pest management. The production of chemicals creates emissions at the source, and there's potential for localized pollution and safety hazards that we can avoid by just not using them.

Slide: 7 Integrate Crops and Animals

Animals are a good way to lessen our need for chemical fertilizers and pesticides. Things like chickens and goats can help keep down pests and weeds and the provide natural fertilization. If you can't have animals, consider adding manure to your compost for extra nutrients. Worms and vermiculture can be considered animals, and these might be a good option for more urban places because they can be kept indoors. And, remember that you're still making an impact if you can't use some of these methods in your garden.

Slide: 8 Use People Power, Not Mechanization

Here we're talking about reducing fuel dependency and decreasing emissions. By doing things like hand pulling weeds, digging beds with shovels, and using rakes and push mowers instead of their gas-powered alternatives. It's hard work but when we garden by hand, we're more likely to notice details and protect our soils too. Running a gasoline-powered leaf blower for just an hour is equivalent to driving a new Toyota Camry 1,100 miles, so little efforts can make a big difference.

Slide: 9 Rotate Crops

Crop rotation confuses pests and helps us balance soil nutrients. Plants suck up different nutrients from the soil, and rotating helps ensure we're not depleting soils. For example, tomatoes are what we call heavy feeders because they need a lot of nitrogen, so it's good to grow plants that add nitrogen in the soil before and after we plant tomatoes, things like peas or beans. This means we're not buying chemical fertilizers to balance the soil, and as we know, happy soils hold onto carbon better. To do crop rotation well we need to keep records to make sure we're not planting in the same pattern year after year.

Slide: 10 Get to Know Your Garden

That brings us to our last method: get to know your garden through keeping records and testing your soil. Keep records the way that works best for you; some people prefer photos, sketches, lists, or even apps. This is a quick sketch I did last season to make sure I was giving my plants enough space, but it will be helpful for when I'm planting this season too. When we spend quality time in our gardens, we can address issues more quickly, so we don't have to revert to chemicals. Testing our soils help us better know what they need from us.

Slide: Methods Recap

Maybe you're already doing some of these, maybe there's some you'll never be able to incorporate. The goal is to do what you can now and build from there.

Slide: Main Take way

If you're going to remember just one slide from all these methods and the whole webinar, this is the one. If you want your garden to be part of the climate solution, do what you can to maximize soil protection and minimize store-bought inputs. I read a great quote recently that said: gardeners are supposed to be producers not consumers, which is a good way to think about minimizing our inputs. When making decisions in my garden, I ask myself: is this protecting my soil? How can I harness a natural process to accomplish this task?

Slide: How do you know it's working?

The scientific way to tell is to test the organic carbon in your soil. You can get a test kit from any agricultural extension office and many local garden stores. Again, a quick internet search should help if you're not sure. Now is a great time to test, then use the methods we just talked about for at least one season or because change takes time, maybe wait several seasons before testing again.

There's a free, more intuitive method as well. And that's to just look at the health of your soil. And you can combine these two scientific and intuitive methods. You should see life like insects and earthworms and you might see actual tiny bits of organic matter. The soil should easily clump together and will have a rich color and will absorb water quickly. Your plants should grow vigorously, which shows they're being well fed by the soil.

Slide: How can we amplify our impact?

We talk a lot about growing soils and growing food, and it's important to mention how we can grow community too. The Victory Gardening movement of the 1940s was successful because it was collective action and communities coming together to support one another. Similarly, today with social distancing and the Corona Virus, community is really important.

So, think beyond the boundaries of your own garden and where we might be able to increase the resilience of our communities, both in general and in the face of the climate crisis. Food is an important way to do this, because around 1 in 8 people in the US are food insecure. This means they don't have reliable access to enough food that's affordable and nutritious. It's around 37 million people, so odds are we likely know someone in this situation or are in this situation ourselves. We can play a role in this issue and amplify the potential for good by sharing our bounty and creating and supporting community gardens, school gardens, and gardens that are publicly accessible in underserved areas.

Slide: Current Impact

We're already seeing a lot of community focus in our Climate Victory Gardening Campaign. Today we have registered around 2,300 gardens committed to climate solutions and using the methods we covered in this webinar. These are all over the country and range from tiny gardens in urban areas to huge rural community gardens. These gardens cover around 3,600 acres.

We estimate that over the next 10 years, these gardens will capture carbon at the equivalent of taking over 70,000 cars off the road for a year. So, there's tangible change there. Our goal is to double the number of gardens by the end of the year, and we hope you'll join if you haven't already.

Slide: Q&A

Here's how you join. Follow the link to register your garden, so we can add it to this map. It's free, and it'll just ask for your location and which of the 10 methods you're using. And this is where you can also access other resources about gardening and climate solutions.

You can find Q&A here.