



HOME GROWN

Food Summit

Straw Bale Gardening

Joel Karsten – StrawBaleGardens.com

Marjory Wildcraft: Hello, and welcome to The Home Grown Food Summit. This is Marjory Wildcraft, your host and guide through this amazing series of journeys we're going to go on together this week. Today, right up for you here, very beginning, first day Monday out, is we're going to have Joel Karsten speaking with you. Joel's a farm boy who grew up tending a soil garden like, you know, other gardeners have for centuries. Joel shook up the gardening world with his first book describing his breakthrough called the straw bale gardening concept. The New York Times has called straw bale gardening a revolutionary gardening method, and his ideas have been enthusiastically embraced globally, making his books best-sellers in many, many languages. Joel earned a BS in horticulture from the University of Minnesota, and he spends his summers tending his vegetable garden and doing research and experimenting with new ideas and methods that he can pass along.

He's a popular speaker and he makes appearances around the world at events that celebrate innovation, gardening enthusiasts and healthful lifestyles. Karsten has inspired tens of thousands of first-time gardeners and a legion of seasoned growers who found a new and better way to pursue their passion, as well as enabled retired gardeners to begin gardening again, since his method eliminates some of the physical challenges that are in traditional soil gardening. You can discover more about Joel and his revolutionary method at strawbalegardens.com. But watch this presentation that Joel has made. I think you'll be pleased, and you'll learn a lot about straw bale gardens and whether they're going to work for you.

Joel Karsten: What I want to talk about is, what is straw bale gardening? Well, when you really break straw bale gardening down to its fundamentals, what we're talking about is a container garden. A straw bale gardening is a, specifically speaking, it's a container garden. I want you to think about the bales as being both the container and the media that you normally would fill up your container with. The outside edges of the bale, they're exposed to the sun and the wind, so as soon as that bale gets wet, the first part to dry out is the outside of that bale. That's what I call the crust. Along with the crust, the strings and the crust work together to sort of form a container throughout the season, your vessel. The inside of the bale does not dry out quickly. It stays moist once that bale gets saturated.

What tends to happen inside of a bale is what would happen, mother nature would do this naturally. If you let that bale lay up against the barn, six months from now bacteria would build up inside the bale, it would start to decompose, and the inside of that bale would literally turn into compost or soil. We're going to aggressively feed those bacteria, and the

bacteria are going to not take six months or a year, they're going to take only a couple of weeks in order to colonize the inside of that bale. They're literally going to turn that straw into compost or early-stage soil inside the bale. This is really important. We're making new soil out of this straw. The big misnomer, the big misconception about straw bale gardening is that we're putting plants, roots, into straw. We're really not. It starts as straw, but it very quickly becomes compost, which is broken down organic material, or what many of us would refer to as soil.

This is a relatively inexpensive garden. If you build a raised bed, if you've ever done that in your gardening career, you know that's expensive to do. Then you have to fill it up, so you're either going to use potting mix or you're going to make your own compost or buy compost to fill it up. You're certainly not going to use the soil that's already there, because you would have planted your garden in that soil if it was such wonderful stuff. You're probably going to have to get soil, and that's going to be expensive. A \$5 bale of straw, sort of average price, \$5, depending on where you live, that's going to hold about 14 cubic feet on average by volume. 14 cubic feet, that's like equivalent to 7 of those 2-cubic-foot bags of potting mix that you buy at the garden center. It really is a relatively inexpensive way to have a raised bed style garden or a container garden without all the expense that you normally would incur.

Straw bales are raised up off the ground. It's a raised height garden. This is really important if you have back or leg or knee problems, can't get down on the ground, if you're a seasoned gardener, if you've been doing this for a few years and getting down on the ground and digging in the soil's not as easy as it once was. Or, as my Grandma Josephine used to say, "You know, kids, getting down on the ground, that's the easy part. It's getting back up, that's where I have trouble." Straw bale gardening allows you to just bend over to that 18 to 20 inch level and do your planting and your harvesting from that level. It definitely makes it more accessible for somebody who's a little older or if you happen to be someone who uses a wheelchair to get around or you know someone who does. This is a very convenient, easy way for them to be able to garden out of their chair without much difficulty at all, and without the expense of having to build raised beds, and the permanency of raised beds as well.

Why would we want to grow in straw bales instead of just planting in the soil? Well, there's a lot of reasons, but the number one reason, and most vegetable gardeners will have this one thing in common, you hate to pull weeds. Straw bale gardens are relatively weed-free. Now, I slipped that word "relatively" weed-free in there because, depending on the bales

you get, the bales could already have some seeds in them. Keep in mind that during the conditioning period when we're going to pre-feed these bales and the bacteria in these bales, these bales are going to get really warm during that two-week period of time. They're going to get hot, and that heat will very often sterilize all of the viable seeds that are down inside the core of that bale.

But if the farmer that harvested the wheat or the oats didn't have equipment that took all of the seeds off of the stalks, sometimes there will be some seeds left over inside the bales. You need to deal with those little spouts that come out. But believe me, it's nothing like traditional weeding in a garden. My first little book I wrote, I put a paragraph in there that if you give yourself 30 seconds per summer per bale, that would take care of all your weeding. I've gotten letters back from people that say, "You know what? That was more time than I needed. I had 35 bales and I pulled 3 weeds the whole summer." It really is a pretty weed-free way to garden when you compare it to traditional gardening for sure. That's one of the biggest advantages of this method, is that there's not a lot of weeding.

Straw holds moisture incredibly well. We know it works really well because farmers have used straw as bedding material for livestock for literally thousands of years. But have you ever thought about why? It really has to do with physics, fundamental physics. If you look at the stalks of oats or wheat [inaudible 00:07:07] the small grains and cereal grains, you notice the stalks are long, narrow, hollow tubes. They're straws. There's two principles of physics, cohesion and adhesion, and they say essentially that water droplets are charged, and when they touch another charged surface, they tend to be attracted to that surface. It also says that water droplets are charged and they're attracted to each other. What happens is a water droplet touches this long, narrow tube, and it gets sucked up inside the tube because of that attraction. Once it's inside the tube, it's now next to a whole bunch of other water molecules, and when you tip the tube up and try to shake the water out, you won't get it to come out.

You might get one drip off the bottom. The next drip will just cling and hang there. That's its inability to break away from the other water droplets. It gives straw this amazing capacity to hold moisture, and you to be able to, if you're a farmer, throw it in with your pigs or your cows and for a couple of weeks it absorbs any moisture. Then, of course, you send your son in there with a pitchfork to put all that wet straw into the manure spreader and haul it out to field. It's a transport device for our livestock, as a diaper. It works for us because we love to have all kinds of

moisture present in the root zone inside this bale. You see once that bale gets completely saturated and soaked, it does a great job. A completely saturated bale will hold between 4 and 6 gallons of moisture inside that bale at any time. It has an amazing ability. The outside edge will dry out quickly, but the interior of that bale will stay nice and moist.

While it holds lots of water, you can't flood it. If you let your water run over night, your soaker hose over on top of your bales, and you have 4 inches of rain also, it doesn't matter, because if there's too much water, it just drains out the bottom of the bales. That's a big advantage. When your neighbors are telling you that, "I can't plant my garden this spring because it's raining every other day and I can't get out there to till my garden," you can say, "Well, I've already had mine planted for a couple weeks. I got muddy feet, but that's my only problem," because you'll never have to worry about whether or not you can plant your garden because you don't have to deal with the wetness of soil. You'll never have a flooded garden.

There are lots of air spaces down inside of a straw. You can look a straw, you can see air spaces in there. Air spaces are really fundamental. They're essentially to root production. When that plant gets put in that bale, it needs to have lots of air space so the roots can get deep down into that bale quickly. If you plant into soil that has some kind of compaction, people walked over the garden or for whatever reason your soil got compacted, you're going to see that your vegetables don't do very well. Nobody's ever going to walk on top of our straw bales. There's lots of air spaces down inside that bale, and you'll see the roots grow rapidly all the way to the edges and to the bottom of that bale, which gives you a good reservoir of roots later in the season when that plant calls for moisture and when that plant calls for nutrients as well.

There are lots of nutrients as the straw breaks down. Sometimes your neighbor will see you put straw bales out in your yard, and your neighbor's going to say, "Well, what are you doing?" You're going to say, "Well, I'm going to plant a garden." Your neighbors are going to say, "Well, I'm a gardener for years, and you can't grow vegetables in straw bales, you have to have soil, because the only place there are nutrients is in soil." Then, you're going to sit them down and you're going to explain that what's happening inside of your bales is bacteria and fungi and worms and insects and mold are all working together to decompose that wheat and oats and turn it into brand-new soil, so you are going to be gardening in soil, it's just that you're going to be gardening in brand-new soil that's just being manufactured by mother nature.

She has her toolkit of those five things she uses, insects and worms, bacteria, fungi and mold. Bacteria happen to be the heavy lifters of decomposition. Anything that's ever been alive eventually becomes soil. It dies, decomposes and becomes soil once again. There's lots of nutrients in that bale, because whatever nutrients it took to grow oats or wheat, nitrogen, phosphorous and potassium, the 3 main building blocks of all plant life on earth, and then there's a whole bunch of micronutrients like iron and calcium and molybdenum, zinc, in trace amounts, it took all those elements to build the oats in the wheat. All we're going to do is deconstruct what mother nature built last summer and make all those molecules again available in this brand-new soil for our new plants to be able to reabsorb.

Straw bales are light weight. You can put them up on your roof if you wanted to. There's lots of people in buildings in larger cities that are gardening now on their rooftops. Straw bales gives you that kind of ability. A 14 cubic foot planting container like a straw bale, if you compare a 35 to 45 pound bale of straw, if you had the same volume of soil, it would weigh well over 400 pounds. Soil weighs between 40 and 60 pounds per cubic foot. You'd have a lot heavier rooftop if you did it all with soil than if you used straw bales for sure. You're going to see straw bales give you lots of flexibility. They're literally movable. You can see in the picture on the left, this is just a wooden box container. If you wanted to put this somewhere it would be real nice looking if you wanted to do flowers or something like that in it.

The one with the pallets on the right hand side, this is a concept a gentleman sent me to do strawberries. He puts his bales up on top of 6 or 7 pallets and then as he conditions them and puts strawberries in there, by the next season he has this waist-high and above little strawberry patch up on top of these pallets. If you couldn't bend over at all, this would be a great option for you as well to be able to raise the height a little bit. If you happen to be a renter and you might need to move halfway through the gardening season, you could build your garden on pallets and literally pick the pallets up and take your garden with you when you move. It gives you that kind of flexibility that you would never have with a traditional garden.

There's no soil required to grow a straw bale garden. I tell people, "If you have sun and you have a source of water and you can get some straw bales, you can have a vegetable garden." It doesn't take soil at all. It certainly doesn't take good soil. As a matter of fact, I'm going to discourage you from ever taking a scoop or a shovelful of your own soil and putting it on top of your straw bales. We want to avoid that. When

we have virgin soil that we're making inside these bales, there's no carryover of disease and insect problems, and there's no weed seeds. But if you take a shovel of soil from your garden and put it on top of your straw bales, you're now soil gardening on top of bales, and you're going to bring in disease and insect problems, weed seeds, and you're going to introduce those into your straw bales. We want to avoid that if at all possible.

No more crop rotation needed. If you've been a vegetable gardener for a while, you know that a fundamental principle of vegetable gardening is you need to rotate crops. You can't plant the same thing in the same soil year after year, because if you do that, you get a build up of disease or insect problems and eventually your crop's going to fail. We don't worry about that, because we're starting with new bales every year or every two years at the most. If you get great big heavy double-compressed bales, the ones that are real heavy to carry home, sometimes you can easily get two seasons out of those, but if you get the lighter ones, you're probably going to have to buy new ones every year. That means you're starting with new soil every year.

If you were going to use a bale twice, that was your objective, the first year I would recommend you plant things in it that you harvest from outside the bale, like tomatoes and peppers, and then cut those vines off at the end of the seasons, leave the roots in the bale, because if you pull the roots out half the bale comes with it, then the next season use that same bale for all your root crops, things like potatoes and carrots and beets, anything that you would need to pull the inside of the bale out to get your crop out. Of course, once you do that, once you cut the strings to get your potatoes out, the bale is no longer a bale. If you did that to a first-year bale, you wouldn't have a second year with that same bale.

There's a lot better airflow around our plants in this mechanism of gardening. You'll notice the trellis in the picture. Believe it or not, there are straw bales underneath all those plants. These trellises are something that we recommend you build. It gets all of your foliage more vertical in your garden. This is something that you're going to put a fence post at the end of each row and stretch wires back and forth. We show you details on how to do this in the book, but it's pretty easy to do. Then, all your tomatoes, your peas and beans of course, you can now hang your cucumbers up on this wire. You could put your squash, your acorn squash could climb up there. This gives you a lot better air flow or air circulation around the foliage of the plants. Air circulation is really important in a vegetable garden. It keeps the leaves and the foliage dry. Wet foliage will

spread disease very quickly in a vegetable garden. Keeping the foliage dry is really important and tends to help you avoid the spread of disease.

Less disease also because of how you water. We're going to use a soaker hose down the middle of the bales. A soaker hose, about \$15 for 50 feet of soaker hose. Or, you could upgrade like the bottom picture and do a dripper irrigation system. This will apply a specific amount of water per hour, gallons per hour, depending on the little emitter you put at the end of the tube. You can adjust these tubes, you can add more or delete tubes, whatever you want to do. Puts a specific amount of water on each plant. This is wonderful because it doesn't get the foliage wet up above. Applies exactly the amount of water we need. If you're using a soaker hose, the whole bale gets the same amount of water as every other bale does, so it's hard to distinguish between your tomatoes and your potatoes and that you give them both the same amount. Certainly, tomatoes during the production season need much more moisture than a potato ever would down inside the bale. Less disease if you use that soaker hose. Change how you water you, you'll see a lot better performance in your vegetable garden.

With a straw bale garden it's much easier to see problems going on in your garden. What do I mean by that? Because things are raised up in the air, you're going to notice if you've got Septoria on your tomatoes like the picture shows. If you see an infestation of potato bugs, you can physically remove them, put them in a baggy and carry them away. If you see an infected leaf on one of your plants that has a fungal growth, take your pruning shears, snip it out, put it in your baggy, and get rid of it, dispose of it. If you leave it in the garden long enough, a little thrip or an aphid's going to come, he's going to dunk his hairy feet in those fungal spores, and then he's going to jump from plant to plant to plant and he's going to spread that disease for you. By eliminating any infected leaves you see or getting rid of any insects you see early on, you can certainly avoid major problems later in the season. I haven't used insecticides at all for insect control in my garden for a long time, many, many, many years. You just don't need them. You're going to see a lot better results with your straw bale garden.

One of the most underestimated advantages of gardening using this method is the fact that these bales heat up. This is really important. During the conditioning period, the bales can get very warm. If it's a 40 degree day outside when you're conditioning the bales, they might only get to 45 or 50 inside the bale. Don't expect a lot. It's kind of like I tell people, if you leave your leftovers laying on the counter, your going to grow bacteria in a hurry. But if you put them in the refrigerator, leftovers

will be good for a couple days. If you put them in the freezer, you might be able to eat that a month from now and it's still fine. If you put a straw bale in a freezer outside, it's going to be hard to grow bacteria in that bale. The warmer it gets, the faster the bacteria will produce. When your air temperature gets to 75 or 70 degrees, you might see the inside of that bale get to 130 or 140. This is going to promote much quicker root production.

We're not going to plant when it's that warm, but after the conditioning period, the bales are going to cool off just a little bit. Now we're going to plant. On the day you plant your tomatoes, the soil right next to the bales could be 45, maybe 50 degrees. Inside your bale could be 80 to 100 degrees. That makes a world of difference. That difference shows in much faster early season root production. You're going to get earlier blossoms, earlier fruit set, and you're going to be the first one on the block with ripe tomatoes, which means, of course, you've won. Everybody knows the first one with ripe tomatoes wins. I always joke that nobody wants your tomatoes in September. You're going to be going to church looking for unlocked doors in the parking lot to throw in bags of tomatoes. It's really the first tomatoes that matter, and you're going to have the first tomatoes because of this warmth coming out of your bales.

Leftover straw. At the end of the season, or at the end of your second season if you're using the bales twice, you have this amazing opportunity, this compost that you've created out of these decomposed straw bales. This is wonderful stuff, so certainly don't throw it away. Don't put it in a recycling bin. This is something you can use as mulch around your perennials. This enhances your other garden soils. It's really great stuff. Certainly don't dispose of it by any means. If you can't get rid of it any other way, ask a neighbor who gardens if they're interested. They're going to come and take a handful of it and they're going to see how lovely it is. They're going to run home and get their wheelbarrow very quickly because it really is some amazing stuff. I use it to fill some pots that I put my annual flowers in. You can use this for your window boxes, because it has all those characteristic that a \$12 bag of planting mix has that you would bring home from the garden center, and you made it yourself out of your leftover straw bales.

A common question I get, and specifically this comes from more urban gardeners, is, "I can't find straw bales. Where can I get straw bales?" Or, the other problem is, "Straw bales are expensive. I can't afford to do this because straw bales cost too much." As the book went more international, I started to get a lot more feedback from Europeans as well, and some of them have this problem as well. It's difficult to find

bales of straw. Another issue for many urban gardeners is, "You know, I love straw bale gardening, but at the end of the season, I have a lot of compost left over, and I can't find any place to go with it. What can I do with all this leftover compost?" A couple of years ago, I started working on some research to help solve both of these problems. This is the solution I've come up with. Make your own bales. Literally making your own bales is a great way to solve both of these problems, and some other common problems around the yard as well. I'm going to show you how I've designed a mechanism to be able to do this, to manufacture your own bales. But keep in mind that to make bales takes pressure. You need to create lots of pressure on the organic material, compression, squeeze it together, in order to get it to decompose quickly enough to perform for our methods.

This is what the bale's going to look like when you're done making it. You'll notice if you look carefully at this bale, there's lots of layers in there. There's some leftover straw from last year's bales. There's some grass clippings. There's some leaves. There's some expired tulip blooms after they're done blooming. There's a few sticks and twigs I tossed in there. If you trim your lilac bushes when they're done blooming, you can throw those in there. All your valentines flowers that have drooped over, you can throw those in there. You can put your kitchen scraps from the kitchen, all your vegetable peelings. Anything that you normally would compost in your compost pile can go into your bales that you're going to manufacture.

Here's what we start with. About a 40-quart tub, something like a Rubbermaid tub or whatever brand tub you have. It could be anywhere from 25 to 50 quarts. The bigger it is, the heavier it's going to be. Trust me, when you get this full and really compressed, they get very heavy. If you're a smaller person, use a little smaller bin. Your bales don't have to be that big. Notice the string in the bottom. I used a little tape to hold it in place. It's just a little trick. Put these strings in in advance and it helps you tie up the bale when you get it prepared. You're going to make your own little mechanism. This takes 5 2x6s to make this one, just regular 2x6s that you buy at the lumber store. This is a self-contained unit. It takes a little bit longer to make and it's a little more in-depth. If you have a tree or a post or an old clotheslines post or a basketball hoop or something you can just drill a hole through, you're not going to hurt it at all, even if it's a tree, it won't hurt it at all to drill a hole through it like that, one in the back of your yard somewhere.

You're going to create this long lever, is really what you're doing. See the little stomper that comes down? That's just 1-inch dowel that goes

through there. If you're mechanically inclined, you can probably see how this is made very easily and you can reproduce it very simply. It's not difficult to make. It takes about 20 minutes to screw this together, and if you get the pressure treated lumber it'll last forever outside so you don't even need to worry about it. We're going to load this bucket up with all kinds of decomposable material, organic material. Then we're going to squish it down really nice and tight. When we get it completely compressed, we're going to tie those strings up that we had laid in the bottom already. These don't need to be super tight, just snug is all you need just to hold that bale in shape until you get it dumped out. You're going to drag it over where you want it to be, and then you're going to dump it out.

If we were to leave it like this, that bale's going to fall apart very quickly, because there's lots of short strands of fiber in there. There's grass clippings and leaves. That bale would crumble very quickly, so we can't leave it like this. You have to wrap it with chicken wire. Get a roll chicken wire. You're going to cut the chicken wire, wrap it around your bale so it overlaps a little bit. Then you're going to take that 2x2 that's laying there and the stapler, you're going to staple both ends of that chicken wire onto that 2x2. But leave the pointy end, leave that stick out the bottom about 3 or 4 inches below your wire. Now you're going to twist it. Twist that 2x2 when you get it stapled on. You can do this with a pipe wrench or an old pliers, whatever you've got handy. You can even do it by hand. You can get it pretty tight just by turning it by hand. When you get it real tight, pound that end that had sticking out into the ground, and it'll stay just like that. Hopefully, you have it in a spot where you want to grow your garden next year.

You'll notice this shot, if you look real carefully, you'll see these are bales that I manufactured myself out of a little bit of this and a little bit of that from around the yard. Over the last couple years that I've been doing research on this, I've found absolutely stunning, amazing results, about 20% to 25% better production from these bales that I made myself than even from my straw bales, which I thought were very productive to begin with. But it's that mixture of organic material that really gets these bales going. That chicken wire and the 2x2 that you stapled onto it, you can just undo those in the fall and you can reuse them again next year after you make some more bales. You're going to have a lot less compost, because this compost is going to have disintegrated down and really turned into soil after this season of gardening. It really breaks down almost completely into soil, so you can spread it out and continue to garden right on top of it. That's how you make your own bales, folks. It's an

exciting thing, and I'm excited to be able to introduce it to you. Hopefully, you got some ideas from that.

Let's talk a little bit more. We need to condition these bales before we plant in them. Whether you made your own bales or whether you bought straw bales, you have to prep them before you plant in them. I get emails in the spring of the year. I have lots of followers on Facebook. I get literally thousands and thousands of questions every week. A common email I get is, "Mr. Karsten, I tried straw bale gardening. Last week I bought two straw bales and I planted tomatoes in them, and now they're all dead. It doesn't work." I write them a note back and I say, "Can you tell me, how'd you prep your bales? How did you condition them before you planted?" They'll say, "Well, I tried this or I tried that or I watered them or whatever. I don't really know what you mean by 'conditioning.'" Then I say, "Well, you missed a fundamental step." You have to prep these bales before you plant in them or mother nature will kill whatever you put in the bales. It's a natural phenomenon.

This takes 10 to 12 days if you're using conventional fertilizer. If you're using organic sources of nitrogen like blood meal or feather meal, it's going to take a little longer, it's going to take you about 18 days to prep. What we're really doing during this time is we're starting the nitrogen sink reversal inside the bale. We're building up bacteria. Bacteria are hungry. What do they like to eat? They like to eat nitrogen. We're going to give them some nitrogen, which will start a little party inside that bale. If you've ever seen bacteria under a microscope, it takes a pretty good microscope to see them because they're really tiny, you'll notice how they grow, how they replicate, is they expand, they expand, they expand, and then they divide in half. When they go to divide in half, they vibrate.

It's that vibration that creates friction that causes your bales to heat up. It's friction from these microscopic bacteria, believe it or not. As the bale fills with bacteria, it's going to warm up. We're going to know that it's working, you can't see it, but you'll know it's working because of that warmth. We begin this whole process by adding their food source and water. That food source is nitrogen. It could be blood meal or feather meal if your organic, or it could be lawn fertilizer if you're a traditional gardener. Just make sure you don't buy anything with herbicide in it. No Weed and Feed in your garden, no pre-emergent crabgrass killer on your vegetable garden. Those are herbicides and they're not good for a vegetable garden.

Bacteria are microorganisms. They're tiny, you can't see them. On planting day, when you go to dig a hole inside your bale, you look down

inside there, you're going to think, "Hey, this guy who told us to do this, he's nuts. This bale looks exactly like it did 2 weeks ago when I started this whole conditioning process." You need to trust me at this point. If you had a microscope and you could look inside that bale, you'd see that everything has changed. If you followed the recipe that I give you in the book about getting your bales prepared, you're going to have bales that are ready to plant by day 12, day 18 if you're doing it organically. But you do need to trust me at that point. You need to measure the temperature of the bales. As long as they're under 105 degrees, you can go ahead and plant.

Bales are going to peak between 130 and 145. They usually never get warmer than 145. That's on a warm day. If it's 75 degrees outside, those bales will get nice and warm inside. If it's 45 degrees outside, don't expect them to get much over 50 or 55 inside the bales. Keep in mind that every time you water, you're going to bring the temperature down a little bit because you're using cold water. I tell people to use warm water, which is really just water you put in a bucket today, tomorrow that's warm water, or it's at least warmed up to air temperature rather than coming out of your spigot at a typical 50 degrees. You're going to see worms love the inside of your bales. You'll get a build up of worms and worm castings, of course, which is wonderful. This is broken down organic material that now has made the molecular structure of nitrogen, phosphorous, potassium, molybdenum, zinc, calcium, iron, all available for new plants to be able to reabsorb. We love the worms.

Mushrooms are going to bloom. I get these emails, too. "Oh, I just came in from my garden, the whole thing's ruined. It's covered in mushrooms." I write them back as quickly as I can and I explain that this is a good thing when you see mushrooms bloom. It's a sign that your bales are decomposing. It's a natural thing. These mushrooms are harmless. The plants you put in them, the seeds you put in the bales, are not going to be affected at all by these mushrooms. If the mushrooms try to push them out, just push the roots back into the bale. You don't need to get rid of the mushrooms, but certainly don't eat them. You don't know for sure what they are. Don't eat them. They're probably [inktoppers 00:31:12], that's what they usually are, but I would recommend to people don't eat mushrooms if you don't know what they are. At least try them on somebody you don't like before you eat them, because you never know.

The results of this process of conditioning is you'll create a beautiful nitrogen-rich media inside the bales. This media has all the characteristics of wonderful potting mix. It's well-drained, it holds moisture really well, it has lots of air spaces, it's nutrient-rich, it's just a wonderful media. It has

a neutral PH, about slightly acidic, 6.9 or so on the PH scale, and is very conducive for root production of almost any vegetable that you can think of. Let's talk about what to plant. This is a very common question also. What can I plant in my straw bale gardening? Anything. You can really plant anything. There's very few things that don't do well. Let's talk about those. Don't plant sweet corn. Sweet corn grows well, but you're only going to get about 4 stalks of corn out of a bale. Roots on sweet corn get huge and they get tall and lanky and they tip over easily. It's just not very conducive for straw bale gardening. It's not economical by all means.

Rhubarb and asparagus are perennial type vegetables. They come back year after year from the same rootstock. Your bales are going to disappear. Whether that's 1 year or 2 years down the road, there's not going to be a bale left. In 3 years, you would have just a little lump of soil left in your garden. If you wanted to use a bale to establish rhubarb or asparagus, you could do that. Just bury a little bit of the bale in the ground, about a third of the bale in the ground, and then plant your rhubarb or asparagus. In 3 years, come back when it's ready to harvest. You're going to have a nice little plot established in that location in your garden with rhubarb or asparagus, or any other perennial.

We're talking about vegetables. All the soup to nuts vegetables that you and I have grown for years in a soil garden. Spinach, onion, beans, radish, lettuce, root crops, all do really well. If you like cucurbits, if you like cabbage, if you like leafy greens, spinach and kale and chard, you're going to love straw bale gardening. It really produces the leafy greens and cucurbits really well. Root crops do amazingly well. Potatoes, carrots, beets. It's amazing, when you grow potatoes in a straw bale garden, I tell people you'll never go back to your old way of growing potatoes because it's so easy. You literally punch, you can do up to 3 potatoes in a bale if you do small ones or 2 if you do bigger varieties, punch a hole almost at the bottom of the bale, and then drop your potato cutting down the hole and leave the hole open.

The potato's going to sprout, it's going to grow 15 inches up out of that hole that you made in the bale. When it gets to the top, it'll make a green leaf, and you're going to push the bale down around that stem you created down inside the bale. All your potatoes are chits, they're going to grow off of, they're tubers, they're going to grow off of chits along that stem. You're going to have a bale filled with potatoes at the end of the year. They come out nice and clean, they don't have dirt chunks all over them, and they taste just the same as they do if they were grown in the ground. Absolutely delicious. They store really well. Because you don't

have to wash off that dirt coating that's on the outside, they tend to store really well, also.

Vine-crops do well. You'll see all your squash and pumpkins and tomatoes in particular, which tend to be very disease sensitive, they like the straw bale environment because of that warmth early in the season and get their roots started earlier. It also eliminates the spread of disease. As long as you never introduce any of your soil to the top of these bales, there's no way for the Verticillium Wilt from last year's garden, or the Septoria leaf spot that got on your tomatoes and cause the blight in your tomatoes, that harbors in your soil. Just don't ever touch that tomato to the soil, don't ever touch a pruning shears to the soil and then touch your tomato plant with that pruning shears. You'll eliminate ever spreading any spores to your tomato plants and you'll have nice, healthy, beautiful tomatoes. One of the most successful crops you're going to grow in a straw bale garden is a tomato. All of the squashes and pumpkins and watermelons all do really well.

Herbs. I like to put the herbs in the sides of my bales, and I leave the top surface for things I'm going to do from seed. If you're planting from seeds, you need to make a little layer of sterile planting mix on top of the bales. Don't ever use your soil. You can plant seeds on the tops of the bales, peas and beans and carrots, et cetera. If you're doing herbs, put them right in the sides of the bales. That's what I like to do. Bale does amazingly well. You're going to see chives do really well. You'll get great production. Flowers. If you like to make vases during the summer and you hate to go to your perennial garden and steal all your blooms from there, put a couple of bales out there and fill them up with flowers. The midget sunflowers do really well. Dahlias, gladiolas, some of the summer bulbs will grow like crazy. You'll see zinnias and cosmos do really well. You can plant those from seed. You'll have a whole plethora of flowers, and as soon as they start blooming you can start cutting them. You can get a lot of flowers stocked in on top of 1 bale, so don't be afraid to really pack them in there and seed it full.

Why you're going to love your straw bale garden. Because there's no weeding, that's the big selling point. I know you're going to hear from people, "Oh, I've used straw in my garden before and there was all kinds of weed seeds that sprout." That's because they broke the bale open. The bale never got hot, it never got a chance to sterilize the inside of that straw bale, so that will happen. If you get a hay bale, that's baled grass, that's livestock food, so they bale all the seeds right inside of the hay bale. If it's too late in the season when they bale that grass, you could have a bale of hay that's filled with seeds, viable seeds. I tell people, "You

get a bale of hay, it's like a box of chocolates, you never know what you're going to get." You might get sprouts, you might not. If you get lots of sprouts, just turn to the little recipe I give you in the book about a vinegar herbicide you can wipe on your bales and it gets rid of any of those sprouts that are coming out real quickly, kills them in about 24 hours. Kind of makes your garden smell like salad for a day, but it gets rid of them and there's no lingering effect of it.

There's no heavy work in a straw bale garden. You don't have to rototill. It's never too wet or too dry. You can get your garden in on time every year, and you don't have to worry about it ever raining too much that your plants end up underwater. That'll never happen in a straw bale garden. They have amazing capacity to hold moisture. I can't talk about that enough. A common question I get from people is, "What about mice in a straw bale garden? Aren't mice and rats going to come to my straw bale garden?" No, because your bales are saturated. They're soaking wet. A mouse is not interested in a wet bale. I have had people who don't keep their bales wet, and then they have mice that come to their garden. That could be a problem, but as long as you water on a daily basis, use the soaker hose or the dripper style system, keep those bales nice and moist, you will never have a problem with rodents in your garden. One quick note. If you do have gophers or moles or voles, a great way to prevent those is put down some chicken wire. Put your bales right down the middle of the chicken wire and then fold the edges up around your bales, and you'll see they won't come in from the bottom, which is what they like to do. You can prevent gophers, and little chipmunks sometimes will do that as well.

It's never too wet or too dry. There's no crop rotation required, because we're starting with new bales every spring. That's a great selling point of this method. We prevent bugs because we get better air circulation around our plants. That trellis is a really important part of a straw bale garden, so don't forget to build your trellis. Deter the spread of disease because of how we water. Again, we're using soaker hose and we're not getting the leaves wet every time we water. If you use an old "chu chu chu chu chu" style sprinkler on your vegetable garden, you are spreading disease in your garden. Every time a droplet of water flies through the air 40 feet and hits a diseased infected leaf, it splashes spores in all directions, so it mechanically distributes that disease in your garden. Switch to soaker hoses. You'll have a lot less issues with disease. Less possibilities of frost. We have a little poly tent we can make and pull over top of our bales. There's a section in the book that talks about the straw bale greenhouse. It's very simple. It's a layer of poly that we pull

over top of the bales to protect the plants if you get a late season spring frost. You don't have to run out there in your pajamas with your milk jugs like you did in your old garden, you just put your little poly tents over the top and uncover them the next morning when it warms up a little bit.

Straw bale gardening is going to lower your cost. How can I say that? You're number 1 input cost, no matter what, is always your labor. It's not your seeds or your plants or your fertilizer or whatever, it's your time. It's the only thing we can't get more of, folks, is more time. Straw bale gardening will eliminate much of your labor. If you don't have to water on a regular basis because you've got a little digital timer hooked up to your soaker hose, so that turns your water on and off once or twice a day, and if there aren't any weeds so you don't have to pull weeds, you don't have to weed, you don't have to water, that's what you spend most of your summer doing in a vegetable garden. Now you can condition the bales and plant and then harvest. When you harvest, I want you to replant, because that's what makes your garden productive. That's the next item. Straw bale gardening is productive because we get can get started earlier and we succession plant those bales. Every time you take something out, you put some more seeds in.

With that extended season and being able to succession plant, remember we're planting the top surface of the bales, we're planting the sides of the bales as well, you can get a lot of production out of even one straw bale. I tell people in general that for every person in your household, if you want to just eat out of your garden and not have to go to the store during the season, plant 5 bales per person. If you want to have enough that you can eat all year long out of your garden, you're going to need 10 bales per person in your household in order to produce enough, and that's if you really stock those bales full. I also say that if you look out at your garden on July 4th and you can still see straw in your straw bale garden, you don't have enough stuff planted in there. You need to get out there and put something else in. You shouldn't be able to see straw at all, because it's just that container down inside there. Your bale should be covered with vegetables and other plants, and if you need to fill in some space, put some flowers in there. You could put impatiens or something on the side of your bales to make it look nice as well. But make it productive, that's definitely important.

I've got a bunch of pictures here at the end I'm going to flip through and show you some examples of different straw bale gardens. This is sort of an ornamental look. It's got some sweet potato vines planted in straw bales, and certainly this is something if you're into the ornamentals, you could do that. This is a production garden. We see some strawberries on

that first bale, the second row, the first bale, and you see some impatiens planted in the sides of these bales as well. These are those plastic covers I talked about. Those are pulled off of the bales and wrapped around the post. If it gets chilly at night, you just pull them down along that wire and cover your bales up. It's a community garden. Everybody who's been part of a community garden knows on planting day, on planning day, there's lots of volunteers. But on weeding day, you can't get anybody to answer their phone. Straw bale gardening is really the answer for a lot of community gardens.

It also means, if the community's going to give you an area, a plot of land, and you get the land tested and it happens to have a high lead concentrations or other heavy metals, it's going to be very difficult for that community garden to buy insurance. That's an important aspect of a community garden, is almost always you have to buy private insurance, unless you can get the city to insure you. That can be a deal breaker. You can put down landscape fabric, buy the big 30-foot wide industrial landscape fabric, put straw bales on top, and you could have a beautiful community garden even on top of contaminated soil. This is a close-up of what the trellis looks like. We give you details on how to build this in the book. I'm not going to talk about too much detail here. This is again the covers pulled off of the garden in uncovered position. This is a little later in the season.

You can see a before and after the exact same angle of this garden with about 90 days difference between the beginning and the end. Another shot of a community garden. This one happens to be out in Kearny, New Jersey. A couple of happy gardeners in the Kearny community garden. This is a great story. They started about 4 years ago with just a few members in their community garden on top of contaminated soil, and now they've got all kinds of people involved and they're big proponent of straw bale gardening. One thing about straw bale gardening, it's going to attract attention. You're going to get people that want to know what in the world you're doing, and you're going to become a teacher. When you put bales in your yard, it's unavoidable. You will become a teacher.

I tell people, first you become a teacher, and after a couple years you get so convinced that this really works, now you become a preacher and you start to tell other people about this method of gardening and how wonderful it is. It happens to most people who try straw bale gardening, so be prepared for that. You'll see the school kids will come and visit, your neighbors will come and visit. It's a very productive way to grow a garden. Here's another example of a garden. This happens to be in California, I believe. A real simple design. Just 4 or 5 bales in a row, very

neat. They've got a boxed-in bottom. A very simple, very neat looking vegetable garden, and extremely productive.

A little bit bigger garden. This is multiple rows of 4 or 5 bales in each row, with the trellises built. It's real early in the season, as well. This is an interesting shot. A woman from up in Michigan found these wooden benches or old church pews and had her husband design a trellis around these half decomposing bales on top of these benches so that she didn't have to bend over at all. She had back surgery and all kinds of back problems, and literally did not want to have to bend over at all to get to her straw bales, so she raised the height of the entire garden. She made the papers, believe it or not. Don't be surprised if you make the papers.

We have a program now called our certified straw bale gardening structures program. It was really a neat program for people who have gardened for a couple years in straw bales, even one season in straw bales, and are excited about it. We don't really have a testing process, we just require that you have some experience and that you've read a copy of the book, and then you can sign up for our program. We'll put you on a directory, which is a worldwide directory on our website, and anybody locally near you who's interested in having someone come and speak to them and teach them about straw bale gardening can reach out to you, the local expert on straw bale gardening. We give you a PowerPoint presentation and all kinds of other support as well to help you.

Here's an interesting illustration. This is a submission that was done by a French landscape architect who had submitted multiple times to the International Garden Festival at Chaumont in the Loire Valley in France, where every year they host a garden festival where they make 24 gardens that people can come and visit for about a 6 month period of time every year. This person had submitted many, many times and had always been denied, because they get thousands of applicants for these 24 gardens. But this illustration came to life. The architect was selected and the garden was built. You'll see there's lots of contours to it and all kinds of meaning behind the garden. As you look through this frame in front you see these different elevations. It was appetizer, entrée, dessert, and cheese and wine was the whole theme.

Each of those different arcs has different vegetables and fruits that would serve those courses in a standard meal. Another shot of the interior of that garden. I got the opportunity to visit the garden in France and we spoke with the directress of the garden. She'd been there for 17 years. She said in her 17 years, 24 gardens every year, she said, "We have never had more interest in any garden than we had in the straw bale garden."

She said, "People were fascinated by it." It was so productive they left all the squash and pumpkins and everything that had grown over the season, anything that wouldn't really decompose quickly they left laying in the garden so people could see how productive it was.

Here's a shot of a before and an after. Very simple garden, but extremely productive. Then another shot of that same garden. Beautiful heads of cabbage. You don't have to have the trellises. If what you're planting is not going to need a trellis, you certainly don't need to do that. I just encourage people to do it because it's a cheap way to get tomatoes. Instead of buying individual tomato cages and then having to support that cage with a post next to each tomato, you just put your trellises in and it seems to work really well for a lot of plants. Here's your individual tomato cages. This gentleman has to put a post next to each one, so it's a little more time consuming and costs a little bit more, I would think, to do this. But tomatoes work wonderfully in straw bales. This fellow actually emailed me and he said, "The sheriff stopped by to make sure I was really growing tomatoes because he'd never seen tomatoes that big before." Number one vegetable crop in the country for sure is tomatoes. People love their tomatoes, and this is a great way to do it.

This is a garden in California. I like this picture because it shows how she has her irrigation system set up, just soaker hoses running down the tops of the bales, and they're all linked together to a master feeder garden hose. You can make different zones if you needed to in order to maintain the pressure. But you don't need to run these for very long, 5 to 7 minutes so you get a gallon or so of water on each bale, and then when the heat of the summer comes you might want to water a couple times a day. The important thing about straw bale gardening is it doesn't take any more water than a traditional garden, it just takes sometimes more frequent watering. I like to tell people, a gallon a day is going to do a pretty good job on a bale. If you're really in the season and your tomatoes are juicing and they're going to use a couple gallons out of that bale every day, you're going to want to make sure you replenish that once or twice a day to stay ahead of those heating tomatoes.

This is a shot from Alaska. It showed what I thought was deer fencing, and I contacted the fellow and I said, "Can I show your slide to show what deer fencing looks like?" He said, "That's not deer fencing. You ought to see how much damage one moose can do in a straw bale garden in one night." He said, "That's a moose fence." Another example of those leafy greens. Chard just does unbelievable, as does your cucurbits, cabbages. Here's a series of 4 slides that a woman sent me who attended one of my

seminars. I used to tell people all the time that you can't really stack bales up, it's just difficult.

If you put one bale right on top of another one, they kind of slump over half way through the season and it doesn't really work. She sent me slides and she showed me how she did it. Essentially, she turned two bales sideways, and then put in a bale across the top of those two and made sort of a little shelf so she could plant different things on different levels of the shelf. Amazingly productive garden. Probably not planted as thick as I would plant, as many plants in there, but she had a nice productive garden. I was kidding her that she's going to need a stepladder to pick those tomatillos off the top of that garden pretty quick, because it's going to get pretty tall. Again, more tomatoes. Number one crop in the world.

Don't be surprised when you put your bales out in your front yard or your back yard and you start watering those bales that your neighbors might come over and think your cheese has slipped off your cracker. It's very common that that happens. It's important that you stick to your guns. Explain, teach them what you're doing. Because they're going to panic, they're going to think you're going to get mice and they're going to think the straw's going to blow all over the neighborhood. It really doesn't. Later in the season they'll understand what your concept was. Believe it or not, you might get some of them to garden right along with you the following year. This is an example, sort of an extreme example, but it's a front yard garden. This is in North Hollywood, California.

She has all kinds of wonderful things going on there. I noticed the sunflowers way in back. You'll be amazed at how productive sunflowers are in the straw bale garden mechanism as well. All kinds of flowers mixed with vegetables. Just something very nice. You can see this is a shot from her house out towards the street. This is not a run-down type neighborhood. This is a beautiful neighborhood. I was asking her, did she have any problems with the city, the city coming around and giving her the business about this garden in her front yard? She said yes, she did have a guy stop by. He had his little book out and he's flipping through the pages, and he said, "You know what? I'm pretty sure you can't do this in your front yard." He said, "You're going to have to remove this vegetable garden." She said, "Well, if Michelle Obama can grow vegetables in her front yard, then why can't I grow them in mine?" She sent him on his way, and never heard from him the rest of the season.

It might be a little bit of a talking point in the neighborhood, but you need to stick to your guns, because it's important that everybody grow

something. Grow a few vegetables. You can teach your kids, your grandkids. You can learn yourself if you've never done it before how to grow vegetables. It really makes you appreciate a vegetable garden, appreciate those fresh vegetables as well. It can really change your lifestyle, change how you think about food, changes how you think about eating vegetables on a regular basis, as well.

I want to thank everybody for joining us today, and I'll let you know that you can always visit my website, strawbalegardens.com. If you have questions, I would first suggest you visit my blog, strawbalegardens.com and then look for the blog tab at the top, because I answer lots of questions there. If you ask me a question that's already on the blog, I'm just going to reply back to you, "See the blog," and I'm going to give you a link. Check the blog first. If the answer's not on the blog, then email me and I'll make sure it goes on the blog, the answer to your question. Thanks for joining me, I really appreciate it.

Marjory Wildcraft: That was a really wonderful overview of what straw bale gardening is all about. If you'd like to get in touch with Joel, pick up a copy of his book or even visit his website, just click on that button over to the right. I think you'll be pleased. It's an excellently, really well-written book, and Joel is very dedicated to getting more homegrown food on every table, which is certainly in alignment with our vision. If you're interested in different gardening types, this whole week every day of the week we have a different gardening method or two up for you. Tomorrow is going to be The Secret Garden of Survival. On Wednesday is going to be mulch gardening. On Thursday is the Mittleider gardening. Friday is Grow Biointensive gardening, and Saturday is going to be all about school gardens. Please definitely be checking back in with us all week. This is Marjory Wildcraft, and you're with The Home Grown Food Summit.