Transcript: STOP WASTING TIME using fertilizers & plant THESE Nitrogen Fixing Trees instead!

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**[00:00:01]** Take a deep breath. What are you breathing? It's   
oxygen, but it's mostly nitrogen, and the same

**[00:00:10]** applies to plants, the soil, and even water. So,   
is nitrogen fertilizer a crazy ingredient to use

**[00:00:19]** for agriculture or gardening? Air is 78% nitrogen,   
about 21% oxygen, so manufacturing nitrogen...

**[00:00:30]** with what? It's mostly made with natural   
gas today. What's the consequences of using

**[00:00:36]** synthetic nitrogen? Yes, let's be honest, it gives   
a bump in yield, especially in the early years of

**[00:00:43]** use while you still have organic matter in the   
soil. With time, adding more doesn't give you

**[00:00:49]** a corresponding rise in yield; it burns up your   
organic matter because soil wants to maintain a

**[00:00:56]** carbon-to-nitrogen ratio. It also ends up mining   
your soil. Why? You're just stealing from future

**[00:01:03]** generations instead of regenerating the soil.   
Unless you use nitrogen fertilizer in smaller,

**[00:01:11]** more frequent doses, it leaches into the water or   
runs off during a rain. It emits nitrous oxide,

**[00:01:19]** which is a greenhouse gas 256 times   
more potent than CO2. If it's so bad,

**[00:01:28]** why is nitrogen fertilizer still   
used? Well, follow the money.

**[00:01:33]** I'm getting to the trees that will save you   
from this fertilizer and from ever having to

**[00:01:38]** use nitrogen fertilizer again. What did plants   
do before the advent of synthetic nitrogen?

**[00:01:46]** Organic agriculture doesn't use synthetic   
nitrogen, and it still produces... yeah,

**[00:01:52]** it uses manure, composts, cover crops, and   
even some organic sources of nitrogen. Did I

**[00:02:00]** discover this? No, it's been well known for   
field crops and lawns. How did I first hear

**[00:02:07]** about this? I discovered it with permaculture,   
and permaculture really introduced me to the idea

**[00:02:15]** of nitrogen-fixing plants in the form of trees   
and shrubs. Yes, I knew about it for perennials;

**[00:02:25]** yes, I knew about it for some annual   
vegetables—beans, peas—but trees and shrubs,

**[00:02:30]** that was the discovery. Now, I use the idea   
of putting trees and shrubs extensively in the

**[00:02:37]** permaculture orchard where I haven't had to add   
fertilizer for the last 15 years since I planted.

**[00:02:44]** What trees and shrubs do I use in the permaculture   
orchard? Stick around; I'll give you my top one

**[00:02:50]** coming up, but one of the ones I use the most   
in the permaculture orchard is Honey Locust,

**[00:02:57]** and not just any honey locust; I use thornless   
honey locust, 'cause thorns are a thorny issue.

**[00:03:04]** It's no fun dealing with spikes and thorns,   
so get the thornless one. It's not the best

**[00:03:12]** nitrogen fixer, granted, but you know what? It's   
a great support species, and supports in more than

**[00:03:20]** just the way of supporting the trees around in   
the orchard; it also supports grape and kiwi. So,

**[00:03:27]** now, this tree becomes a fruitful tree,   
not just a fertilizing tree. It also is a

**[00:03:35]** tree that fertilizes and produces fruit.   
That's a plus. Don't underestimate it.

**[00:03:42]** One of my favorite nitrogen   
fixers, or at least potentially,

**[00:03:46]** this is a controversy—does it fix, does   
it or doesn't it? Check the comments;

**[00:03:51]** I'm sure you'll see the controversy—but this   
is Eastern Redbud. I say, even if you don't get

**[00:04:00]** much nitrogen fertilization from this tree,   
just the beauty of it in flower is worth the

**[00:04:06]** 10 days of the year that that happens, but it's   
another choice, it's another option that you

**[00:04:13]** could use with your fruit trees, with your   
lawn, with your garden, and it's beautiful.

**[00:04:19]** Get that, I said trees and shrubs.   
Here's a shrub right now in full bloom:

**[00:04:27]** Autumn Olive. And I know people hate   
on this plant; it's an invasive,

**[00:04:32]** it's taking over, but look, nitrogen-fixing trees  
It's like nitrogen-fixing trees and shrubs are

**[00:04:39]** Earth's restorers, Earth's repairers. They're   
there to bring the soil back up to fertility,

**[00:04:47]** so that if it was a forested area, and it   
should be, 'cause if you're able to grow trees,

**[00:04:52]** it was probably forested at one point, so that   
the forest that is best suited for that area can

**[00:04:59]** grow really well. Too bad you can't smell this,   
'cause the smell, the fragrance of nitrogen-fixing

**[00:05:07]** trees and shrubs, is really important for your   
health, but also to attract a wide variety of

**[00:05:17]** pollinators and beneficial insects. A lot of   
times, the flowers can be quite small or quite

**[00:05:24]** big, but you can just hear the bumblebees buzzing   
around in here. These trees or this shrub is

**[00:05:33]** fast-growing. How well is it fixed? Look, they're   
on a scale; some are way better than others,

**[00:05:41]** but you know what? They're all trying to make the   
site better. I did say fragrance, and boy, this is

**[00:05:49]** almost, almost peak bloom. Buffalo Berry, another   
nitrogen-fixing shrub, hardy. This is able to grow

**[00:05:58]** in the prairies. This is a tough plant. It doesn't   
grow very large. Maybe you have a small yard,

**[00:06:05]** a small garden, and you can't put a tree, then   
think of some of the smaller shrubs that will fill

**[00:06:12]** this void. Certainly fixes nitrogen, certainly   
attracts beneficial insects and pollinators,

**[00:06:20]** but this one also will give you some fruit,   
not great, not as good as Autumn Olive,

**[00:06:26]** and not as good as some of the other ones,   
but it's really the ability of these plants

**[00:06:33]** to replace nitrogen fertilizer that is their   
strong point. These plants make your soil better.

**[00:06:41]** Another nitrogen-fixing shrub, Caragana. This   
shrub loves a lot heavier soil, more clay. We're

**[00:06:51]** in extreme sand, and it just has never thrived   
here, but wherever you are, there is a whole range

**[00:06:59]** of trees and shrubs. Look up a nitrogen-fixing   
tree or nitrogen-fixing shrub for your area. We're

**[00:07:07]** at the northern end or the coldest end of what is   
possible. I would be quite certain that there is a

**[00:07:15]** lot more that you could use than what I could use.   
It's another one; it's a possibility, not for me.

**[00:07:24]** Back to trees, I said shrubs. Trees,   
here's one, a bit controversial as well:

**[00:07:31]** Kentucky Coffee Tree. Not a fast grower by any   
stretch, and how good is it at nitrogen fixing?

**[00:07:41]** I'm not sure. You know what? I said it's a   
continuum. I look at how well it's doing,

**[00:07:48]** and the better the tree grows, the more it's able   
to capture sunlight and put the fertility into the

**[00:07:57]** soil. This one is so-so. It's a possibility,   
but certainly not if you're in a hurry.

**[00:08:04]** One of the best for its ability to fix   
nitrogen—well, certainly one of the ones that

**[00:08:10]** grow the fastest, at least on our site—is black   
locust. These were seeded from a little seed,

**[00:08:18]** and the seeds are tiny, 13 years ago, and they've   
become the largest trees in our permaculture

**[00:08:24]** orchard. They're a great nitrogen fixer, one of   
the top, and you know what? They're thorny. That

**[00:08:35]** is something to consider if you've got a smaller   
property; you really don't want to contend with

**[00:08:42]** thorns. So, I'd say avoid thorny in preference;   
you have a choice. There are options, and thorny

**[00:08:50]** is not a trait that you want to be dealing with   
when you're pruning or just going through the yard

**[00:08:58]** and risk getting impaled, 'cause some of these can   
be quite large in the thorns. But the growth and

**[00:09:07]** the ability to capture some atmospheric nitrogen   
and replace fertilizer is really quite important.

**[00:09:16]** Another controversial, in this case, tree   
is Russian olive. I know some people,

**[00:09:23]** in some climates, this becomes weedy, and I like   
to say you want to grow an orchard of weeds;

**[00:09:32]** weeds in that you put trees that grow extremely   
easily. If this is growing really easy in your

**[00:09:40]** site, then grow it because there's nothing better   
than easy. If all you have to do is keep cutting

**[00:09:47]** it down, then you've got material to really   
improve your soil quicker because, in the end,

**[00:09:54]** that's what these trees and shrubs are trying   
to do: improve your soil, whatever your climate,

**[00:10:01]** whatever the water you get, whatever your   
moisture regime is. So, these Russian olive,

**[00:10:09]** one of the things I like about all the   
nitrogen-fixing trees and shrubs, is that they

**[00:10:16]** flower after my fruit trees are done. What does   
that do? Boy, in the years when maybe the fruit

**[00:10:24]** trees didn't flower as much, or they did, and then   
the nitrogen-fixing trees and shrubs flower a lot

**[00:10:32]** as well—wow, the bees, the native bees, not   
honey bees for me; I don't want honey bees;

**[00:10:38]** we've got too many native bees as is—so the bees   
get such a great store of pollen and nectar. So,

**[00:10:48]** these help really increase and extend my flower   
succession, and just for that, they would be

**[00:10:57]** really important and valuable as an addition   
to the orchard. But they do far more than that.

**[00:11:03]** This is a beach here; this is an old beach,   
and that these trees are growing when a whole

**[00:11:09]** bunch of other trees and shrubs just   
won't grow 'cause it's too poor. They

**[00:11:14]** are the first stage in getting this site back   
into shape after years and years of neglect.

**[00:11:22]** Maybe you're starting in a tough place; maybe   
your soil has been neglected. Getting some of

**[00:11:28]** these trees and shrubs to work and reverse   
that degradation is really, really helpful.

**[00:11:35]** One tree I don't have, that's one of the best   
nitrogen fixers, is Alder, and there are Alders

**[00:11:42]** for pretty well every climate in the temperate   
climate. They certainly will grow way farther

**[00:11:49]** north or colder from where we are. I just never   
got any and tried them out. They're really a big

**[00:11:59]** shrub, not so much a tree, although the European   
Alder is. But Alders, from what I've seen,

**[00:12:06]** are some of the very best at improving the soil.   
If you're not sure how the soil is getting,

**[00:12:13]** then dig at the base of your nitrogen-fixing tree   
or shrub. Check it out every once in a while;

**[00:12:19]** see how much it's darkening your   
soil, improving it. See how the

**[00:12:24]** plants around it are growing. No tree,   
no shrub—pretty weak growth in this area.

**[00:12:34]** My second-favorite shrub for fixing nitrogen   
is this Goumi. How good it works, not certain,

**[00:12:44]** but I say second from the top because it fruits,   
which is a real bonus when you figure it's

**[00:12:52]** nitrogen-fixing and it produces fruit. That's   
a twofer. We have it next to our apple here,

**[00:12:59]** here, but that's part of our trio system, so it is   
meant to fertilize the fruit trees on either side,

**[00:13:06]** or the nut shrubs, whatever is in our trios.   
But the ability to stay smaller—you may say,

**[00:13:14]** "Well, it's in my climate, it grows   
bigger," and probably does—in our climate,

**[00:13:19]** it actually winter kills some years, so it   
has to regrow from everything that was above

**[00:13:25]** the snow to regrow. But, you know what, this   
year it's flowering, and it will produce fruit,

**[00:13:31]** hopefully, and I'll get to try it, and   
then it might move to my number one spot.

**[00:13:36]** Number one nitrogen-fixing shrub is seabuckthorn.   
Why? Because it produces fruit, it fixes nitrogen,

**[00:13:46]** it suckers, so it gives you more plants; can be   
a pain if it suckers too much. You need male and

**[00:13:52]** female shrubs to produce fruit, and normally from   
seedling, these can be thorny, but these Russian

**[00:14:00]** or Ukrainian cultivars are thornless, a great   
trait. And these, yes, the fruit is amazing. I did

**[00:14:08]** say they fruit, yeah, and it's great fruit, either   
eaten fresh or transformed. If you plant these,

**[00:14:17]** you'll get fruit. If you plant some of the   
other nitrogen-fixing trees, especially,

**[00:14:22]** or shrubs, and they don't produce fruit, then   
check out this next video, and you'll get fruit.

# Full Text (without timestamps)

Take a deep breath. What are you breathing? It's   
oxygen, but it's mostly nitrogen, and the same   applies to plants, the soil, and even water. So,   
is nitrogen fertilizer a crazy ingredient to use   for agriculture or gardening? Air is 78% nitrogen,   
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then it might move to my number one spot. Number one nitrogen-fixing shrub is seabuckthorn.   
Why? Because it produces fruit, it fixes nitrogen,   it suckers, so it gives you more plants; can be   
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