Raised Bed vs. In-bed Gardening

SUMMARY KEYWORDS
raised beds, raised, bed, crops, soil, plants, irrigation, growing, ground, vegetables, system, extension, weeds, garden, backyard, question, big, differences, weed management, advantage

SPEAKERS
Speaker 3, Christa Hartsook, Dr. Ajay Nair, Olivia Hanlon

Christa Hartsook 00:15
Hello, and welcome to the small farms podcast, a production of the small farms program at Iowa State University Extension and Outreach. Our podcast covers the opportunities and challenges associated with rural life.

Olivia Hanlon 00:29
In this episode, I visit with RJ Nair, vegetable specialists with Iowa State University Extension and Outreach. Today we are talking about raised bed versus in ground gardening. I'm Olivia Hanlon, farm food and enterprise development education extension specialist and we hope you enjoy the show. RJ Welcome. Glad to have you back on.

Dr. Ajay Nair 00:49
Thank you Olivia, it's always nice to be on this and discuss horticulture

Olivia Hanlon 00:54
course we enjoy having you. So first, let's get started with talking about each method and how you get started. And what's what's easier, what's hard about each method. So could you go ahead and give us a brief overview of what the process of preparing each garden looks like.

Dr. Ajay Nair 01:12
So, you know, as the weather warms up, I know, we all are outside in their backyard and even for in commercial production systems, you already started planting cool season vegetables. But one of the questions which we get a lot is, you know, our listeners and gardeners and acreage
owners, you know, wrestling with the question whether to grow vegetables in soil, or in raised beds. And I think it is an important question, you know, that has direct implications on how your crop will grow and how you will spend time in your garden in your backyard. And there are certain, you know, very significant differences between growing your vegetables or any other plants on raised beds versus, you know, in ground without raised bed production system. So, as you know, we can talk more about, you know, the advantages, disadvantages, but definitely a huge difference between these two systems.

Olivia Hanlon 02:04
Alright, so when we're looking at getting started and planting, what are the differences in the requirements before planting? So do they require different temperatures or fertilizers to get started, and then are there differences in how you can plant both of these systems.

Dr. Ajay Nair 02:21
So, let me just define raised bed first, so that you know, our listeners have an understanding of what raise bed versus in the ground production. So I'll go with the latter first. So in the ground production is just like, you know, you go out to your backyard, you have your level playing ground there, you either you know, tear it up a little bit or mix it up and you plant. So it's right directly planting, you know, on the soil surface, whereas in the case of raised beds, raised beds, as the name suggests, these are freestanding beds that are constructed about the natural terrain, so they're not on the plane ground, but they are about the planting area is raised above the existing soil level and usually it is enclosed, you know, within a structure, you know, it could be you know, a wood, it could be rocks, some people might use some kind of a plastic you know, frame so it could be anything, again, just a structure above the ground about six to eight inches high inside which we fill the type of soil we want to we have to formulate that soil and grow. So that is typically a raised bed, you don't need a structure to raise, you can simply pull some soil from the sides and create a raised bed, that's also a raised bed. So that's the definition of raised beds. And if again, if you're growing it on the plane, you know, the ground the soil surface that will be like an infield or the ground production system. Now last about you know, what are some of the benefits of growing on raised bed, there are several benefits actually, you know, when you're growing on the raised bed, it definitely improved soil drainage, that's the big thing. And for our listeners, if they are stuck in a situation where for example, let's say your soil is compact, or you know, it's an area where the water stands. And it's difficult to grow thing you know, any crop in the ground there, that would be a good place, you know, good situation where one can construct a raised bed and improve drainage and also these raised beds warm up quickly as compared to you know, level ground. So provides you know, provides drainage, it helps to warm up the soil. You know, it's a great resource for people with limited space also because sometimes you know, you don't have much space and the space you have need to grow things you know, and you know, grow well and harvest and enjoy. So they're a perfect fit for that they also help with you know, the issue of bending down, you know, if you're growing things on the level ground, one has to bend down in order to remove the weeds or harvest or tend to the plants with a raised bed you don't have to bend or stoop backwards down so maybe you know, that's something for folks to consider. Another advantage of raised bed is that one can formulate their own growing media because now you're not growing on the soil you are making or mixing your own media. And that gives you a lot of flexibility in making sure you choose you add compost, you can add a topsoil you can add
soilless mix, and gives opens up the opportunity of formulating our next suitable for any any particular crop you're growing. And of course, you know, raised beds, at the end of it, it's all about convenience, it's all about you know, making sure the plants are in a setup where they will grow well, they will produce will yield well, so ultimately, with the fun of gardening, the fun of you know, growing stuff, you know, you you meet that you at the end, you have a good productive crop.

Olivia Hanlon 05:46
Absolutely. So maybe our first question here Rj should have been are there certain crops that grow better in raised beds than in ground probably something that will affect which system here you go with.

Dr. Ajay Nair 05:58
So with respect to you know, planting of crops, it's not much different between those two systems, plane ground or on raised beds, you need to have a loose soil, so you can put your seed in there or put your transplant in there. So not much differences there. But when it comes to crops that are suitable for raised bed versus you know, level ground, most of the crops would benefit by being on the raised bed, again, that's because of proper drainage, you know, a quick warming of the soil as compared to in and less compaction because you know, you have created this respect. So those three things positively, you know, affect any of the crops. So crops such as you know, that have root systems, which go, let's say about, you know, 12 inches, 18 inches, you know, crops such as tomatoes, peppers, eggplants, many of the cucumbers we don't have that have a deep system, watermelon, maybe, but like muskmelons and all these wet vegetables, you know, they are perfectly suited for growing on raised beds, leafy greens, absolutely fine, even carrots they're fine. And many of the cauli crops, cauliflower, cabbage, all are good, certain crops, which are not suitable for raised beds, and those are primarily our perennial crops, you know, think about asparagus, think about rhubarb, you know, asparagus, the rooting depth can go as deep as six to eight feet. So in that case, raised beds, six inches doesn't meet their purpose, because the roots have to go down further into the ground. So you need a better soil, no matter what, you know, five to six feet underneath. So those you know, crop are not well suited for raised bed. But otherwise, many of our vegetables are perfectly suited to be grown on raised beds.

Olivia Hanlon 07:41
Okay, so then when we're looking at what we're growing in these systems, sometimes we look at crop rotation within gardens, is this something that you should use both in ground? And if you've got a raised bed, or what should we consider there?

Dr. Ajay Nair 07:56
So I would say the answer is yes, I would definitely consider rotating crops. And a typical rotation is three years, which means if you planted a crop or vegetable from one family, you should not be planting any other crop in that family for the next three years. That's an ideal
And when I say family, you know, you need to know the crops fall in certain families. We've talked about solanaceous crops in tomatoes, potatoes, peppers, eggplant are in the same family cucumber same family. So yes, the answer is yes. And the advantage of crop rotation is that we tend to see lower amount of diseases, soil borne pests, when we have crop rotation. If we don't, we're going the same family again. And again, there are more chances of your pest being in the soil and affecting your root system and ultimately, the plant health and the growth and finding the heat. So the answer is yes, it will be nice, it's recommended that we rotate our crops even on raised beds.

Olivia Hanlon 08:55
Okay, that makes a lot of sense. Rj. You briefly mentioned size requirements earlier. But do you want to tell us a little bit about how much land we're looking at, or how big of a garden you're looking at for each of these systems?

Dr. Ajay Nair 09:10
Sure, when we talk about raised beds, as you know, there are two categories if you want to look at you know, more distinctively, there is one you can call it the raised ground bed in which you simply you know, pull soil or create a mound, that's, that's a raised bed. And typically these are this mound or this bed or in a row would be about six to eight inches high. So that's one and the other one is more of a supported raised bed. In this case, you are not simply just bringing the soil there's a structure within which you pull the put the soil so that would be more of a supported raised bed. These you know can be made with wood with stone with brick or even plastic. What typically what you see out there are wood, it's a two by six, you know, two inches wide and six inches high, a board which is about six to eight feet long, and you would use that to make like a rectangle with an enclosure, or even a square, and that would be a typical structure of the raised bed. When we use wood, it is advisable to you to use, you know, non treated wood, because you know what any chemicals and all, you know, in there, maybe, you know, could be created using untreated or rot resistant lumber, for example, cedar, that's a great example it adds the cost. But the more durable, the more robust the wood is, the longer the longevity of that respect would be.

Olivia Hanlon 10:31
Yeah, absolutely.

Dr. Ajay Nair 10:32
So the shape and size could vary, depending on how much access you have, you know, what, if you're in an area, which is more rectangular than square, then you make rectangular raised bed. But if it's more square, you can expand you know, one or both ways. So it all depends on what you want to do. And as the name suggests, it's a raised bed, it's just not on the ground surface, but you bring the soil in either in a structure or an open or free ground bed, and you just bring the soil up and create the raised bed.
Olivia Hanlon 11:00
Okay, so for an inground system there RJ, is there a certain size that we would consider a minimum for that.

Dr. Ajay Nair 11:09
So if you if you're growing your vegetables in the ground, you know, it again falls back on, on on what we want to do, you know, there are gardeners who might have just two or three plants, you know, two or three tomatoes, and one or two peppers, maybe one muskmelons plant, and they might have a small row five feet of some leafy greens, so it's all up to us. So there is no limitation in terms of you know, the length, width or the area. Same with the raised bed, with the raised bed one way to look at it, it could be just a single mount, which is to create one mount and on that mount, you might put two musmelons so that's still a raised bed, or you can think of a of a linear raised bed, which is maybe five feet or 10 feet long and six inches high on that you might put tomatoes every 18 inches, or every, every 24 inches. So size and shape doesn't matter. It's all up to us how we want to do it, the space we have, and the resources we have in terms of the let's say the structure, materials, and the soil medium to create our raised beds.

Olivia Hanlon 12:11
Okay, So then when we look at upkeep for these RJ is one method easier than the other, whether it be during the season with weed management, or from year to year to use it again.

Dr. Ajay Nair 12:23
In the case of weeds and, in the case of raised beds, one thing to keep in mind is these are kind of a semi permanent structure, you don't move your raised beds around, you have it in one place. And that is your raised bed for many years four or five years until you see that either the wood is decaying or things are not working or things are you know, or you really want to change because there was shade in that place and you chose the wrong place. So these are semi permanent, so you won't change it around. Whereas in the infield, you can plant anything anywhere. And one of the flexibilities of having that is you can easily rotate your crops. So in this part of the garden, you have tomato next year, you move to the other part of the if it's if it's not raised, but it's very easy to move things around. With the raised beds, you're kind of stuck in this place. But again, if you follow proper rotation, that's still a manageable space. In terms of management. As I said, you don't have to bend that much in raised bed. So that might be something you know, to consider folks who are you know, at a stage where they don't want to bend that much are not able to, raised bed is the way to go weed management in both locations, you have to manage the weeds. You know, most homeowners, we recommend not to apply herbicides, you can easily haul the weeds off, you know, or put plastic mulch, or you can put just like a simple regular straw mulch or you can even use weed fabric and there are many options for our homeowners and backyard gardeners. But even in commercial setup, I'm seeing more and more folks using you know black plastic and weed fabric to manage weeds. So, weed management will be very similar in both watering could be a little different in the raised beds as you know, raised beds are a little higher, they warm up a little early, so they might need a
little bit more frequent watering as compared to on the on the plane level ground. So that is something to consider. Also, because the plants that are growing with raised beds, they are growing on a bit faster pace. So their requirement is more than then what's on the level field. So depending on how the plants grow your irrigation requirements, your watering requirement might go up in the raised beds so make sure we are creating a raised bed where we have access to irrigation, you know something not very far from our house or or from the shed where you have resources. So keeping it, keeping it close by so those would be certain things to consider.

Olivia Hanlon 14:42
Okay, so now I've got a big question for you here. Rj. Do you see a large cost difference between the two methods, whether it be in the startup costs, the input costs, or with your return yield differences?

Dr. Ajay Nair 14:56
Sure. So raised beds would be In terms of water, there might need a little bit more water than the plane level ground. But there is an initial cost of setup, you know, the cost of the building material, the construction and maintenance if something breaks down. So once you bought the initial materials to set it up, that the investment is in your time, so the effort you put in there, so the labor, but as I said, that's only the initial part to bring in the media, mix the media, add the compost, I mean, those things all add up in terms of your time and your effort. And sometimes, you know, people want to do that. So they will see that as an investment said, hey, you know what, I wanted to do this, so, but there is some cost in terms of the materials. But once it is constructed, you know, most homeowners, most gardeners, they love the raised bed, again, due to all the benefits I just mentioned, warming of the soil, better drainage formulation of your own media, better plant growth, better aeration, better root growth, I mean, those are all benefits that outweigh growing with a level level, you know, ground, so level ground, your soil might still be good, I mean, the level ground would still be good. But if everything is equal between level ground, if there is a level ground, which is very good. And if you great respect on it, maybe you'll see a little bit of benefit of having the raised bed, again, because of all those benefits I mentioned earlier. Raised beds, you know, every four to five years, you know, folks need to assess now, how good is the raised bed,that if that structure is still holding properly? Sometimes you might see cracks and things falling apart in that time, you have to do some maintenance work. But you know, otherwise, the initial investment which you put in there and the time that's that's what is different than than a plane on level ground production system.

Olivia Hanlon 16:38
So then Rj, along with that question, do you see any yield differences? I know you guys do a lot of research. So between raised bed and ground?

Dr. Ajay Nair 16:47
Yeah. So yes, we do see differences. When we grow our vegetables on raised beds versus a level field. One of the difference, you will see that the plants that are the raised beds grow
One of the differences you will see is that the plants that are in the raised beds grow quickly and grow faster, so their rate is higher. And they are a little bit bigger in size as compared to going on the raised bed. On the level field because level field, I mean no matter how much tillage you do, there is some level of compaction there to begin with, you don't have that in the raised bed. So there are differences and they those yield differences will definitely pay off. At the end of the season, you might be harvesting more, when you're growing a raised bed versus when you are growing on level field, you might find because the plants are more robust and more bigger the way they are growing on raised beds, they might be able to take the damage caused by insects or diseases a little better, because they're already big. Whereas the ones that are a little smaller, you know, they might circum bit more so that you might see differences there. So there is pay off when you grow on raised bed, just because of the fact that there is better drainage. And when there is better drainage, the roots grow well, there is more aeration. And then the roots grow well, the plant grows well, and so finally pays off. So raised bed would definitely have a leg up when compared to your level field production.

Olivia Hanlon 18:07
Okay, so to wrap up here, do you want to pick one or two of your favorite advantages of raised bed gardening and then one or two of what you think could be the biggest disadvantages?

Dr. Ajay Nair 18:20
Yeah, so I think the advantages we pick, we get to choose where we want to put the race paid and that decision should be based on number one availability of light should have enough light wherever we are creating a raised bed, but proper irrigation. But again, the advantage of starting early, that's a huge advantage of raised bed, because the soil warms up, you can start planting in there maybe three weeks early than then the level field two to three weeks. So that's a plus. You know, the benefit of the advantage of having a better root system in race back the advantage of formulating my own growing mix, so I will I use my topsoil, but I also amend with compost, I am add in some soilless mix, it's a good time for me to add some fertilizers if I want to. So a lot of benefits, you know, because you are managing it. And plants grow bigger, they grow faster. Yes, I need to manage the irrigation better. I don't have to bend that much. You know, especially with tomatoes, when you have to start trellising them, you know, it could become a little challenge. So a little bit of ease of working, no issues of compaction. That's another thing which we see backyards. Oftentimes when we let's say get a big rainfall event or there might be areas in your backyard or your acreage where you know water stagnates or stands so heavy, we know that place obviously you cannot grow there. So there is no other option you cannot grow there. So you try to look for a spot where you know it's better or you can create a raised bed which will help you to mitigate that issue. So those are some of the advantages of growing on raised beds. Some of the disadvantages, I would not call it a disadvantage but some of the consideration is again, the cost of installing it, irrigation one has to be taught on top of irrigation because you know, efficient and timely irrigation have raised beds, you know, as they dry out faster than the native soil. So definitely one has to consider that you cannot grow some of the perennial vegetables like you asparagus and rhubarb, and they need to have a deep taproot system. So that might not work. And then if using, you know, we tried to use the untreated wood, which eventually will rot, and by five to six years, you might have to change it, change it. And sometimes I'm not that most of the time,
but sometimes you get raised bed gardens, that tend to attract and harbor slugs, when there is moisture in those beds on those frames. So sometimes I have heard that, but not that's not something I'm not concerned about. So yeah, those would be my pluses and minuses.

Olivia Hanlon 20:53

So I suppose then you're in ground gardening, or just vice versa. So your disadvantages to your raised bed would be your advantages.

Dr. Ajay Nair 21:02

Correct Yeah. So the on ground on level field, again, there's nothing wrong of doing that. I mean, there's a slight advantage of growing on respect. But if your soil is good, if you have amended your soil with compost, the soil quality is good. If it's not in a low lying area, you can go, you know, pretty much everything on level ground as well. But if you know there are issues, especially with compaction, that's one. And you know that, you know, soil is a bit more heavier in that part, and the roots cannot penetrate, because maybe too much clay in the soil. Those are the factors which I would look into Oh, yeah, I think I'm gonna go with raised bed because my plant growth is going to be effected. And then the benefit, the plane level field won't give you the advantage of that higher temperature and better drainage. There's another thing, you know, which the level ground in ground production system lacks.

Olivia Hanlon 21:50

Is there anything we didn't cover today that you want to add?

Dr. Ajay Nair 21:54

I think we covered most of the thing we talked about the placement, and that is something very important light, the plants need at least, you know, 10 to 12 hours of sunlight to especially vegetables they do they need that line, no shade. So make sure you put your raised bed in a fully lit nice area, we did not talk about in a specific fertility requirements much but it's very much similar plants are more efficient in using the fertilizers and nutrients when they are the raised beds, again, because of the better drainage and aeration. We didn't talk about insects and disease, but that's very similar in both situations, you have to scout you have to manage them. And irrigation, you know, both needs irrigation, there is no difference there, the plants on the raised bed, might need a little bit more irrigation just because you know, there's better drainage and they're using the water more efficiently because the plants are bigger. But otherwise, you know, I would support both systems, it all depends on what your conditions are, you can both are equally good. But you might choose raised beds in certain circumstances where you know, space or the soil quality we talked about could be a hindrance, but otherwise, both systems were great. And I encourage everyone, given the pandemic, we have seen the increase in in everyone kind of starting a garden growing their vegetables in our backyard space. It's not only, you know, good for us because we are growing something which we would consume and share. But it's also therapeutic, you know, being out in the garden working.
Everybody is right now you know, wanting to be out there with the weather getting better. And you Iowa, we don't get that much of a time to grow our vegetables. It's a short growing season. So everybody just get out there and let's get growing.

Olivia Hanlon 23:36
Absolutely. All right. So RJ, if people are looking for more information on either raised bed or in ground gardening, where could they find this? I know we talked earlier about an article that's out there and I'm happy to put those links in there but where would you recommend they go to?

Dr. Ajay Nair 23:52
I would recommend you know checking the ISU Extension store so our horticulture department, the consumer heart group, they have certain publications on raised bed production also about trickle irrigation because that's another question which we get in the backyard how to install trickle irrigation. So look for ISU Extension store and go on that website. Many of these publications are free to download a PDF download. I would also recommend the whole horticulture pest news HHPN which has which is a wonderful resource of all questions, you know, related to any of the crops or horticulture on the consumer level, backyard garden, you know, kind of level but you know, everything is applicable, you know, to larger, you know, field or equities as well. So horticulture and home pest news, the ISU Extension store, those will be good resources. And then for that reason, extension publications from our neighboring universities and institutions. Those are also you know, they provide very important and relevant information. So those are some places to go and check.

Olivia Hanlon 24:52
Perfect. Well thank you very much for joining us today. RJ, it's always good to have you on.

Dr. Ajay Nair 24:57
Thank you very much, Olivia.

Speaker 3 24:58
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