

A-03 Special Case – Growing Potatoes Vertically

Experience – We tried this for four years before giving it a rest, but we remained intrigued—many were touting almost outrageous production that never happened. There were also many proponents of stacked wooden boxes so that’s what we tried. The results were less than field production and the same as shown in a *Mother Earth News* article. You can see the stack of idle potato boxes in a Chapter Two photo.

Meanwhile, an early experiment with growing sweet potatoes vertically in a fence-wire circular tower was moderately successful but the tubers lagged seriously behind. What we ascertained was a lack detailed information on *how* it gets done with what type and consistency of “mulch.” No details were provided.

So, we went back to the traditional method of growing potatoes horizontally in garden beds from which we gained a lot of experience in managing these tubers while leaving the concept of vertical growing. After about four years and when cleaning up the garden storage area, we decided to research this one more time before dismantling the old potato boxes.

Through one particular website, we were returned to the success we once had with the sweet potatoes. Here seems to be the answer to our furtive pleas for details with realistic expectations on production. Detailed below is what we are experimenting with in 2024—the results will follow.

Best Known Resources

Fine Gardening Project Guides – [www.finegardening.com/project-guides/fruits and vegetables](http://www.finegardening.com/project-guides/fruits-and-vegetables)

You may have difficulty finding this article. Google: *growing potatoes vertically* to find the web page.

How to Grow Potatoes in a Tower – Good explanation with a particularly useful diagram showing how to assemble a vertical growing tower for potatoes with the right kind of growing medium, not some vague description of a mulch. The author also shows real results, not some make-believe hype.

Strategy

Forget Wood Boxes – These do not work. Yes, the plants eventually grew out the top but the production inside the boxes was substandard to field growing. The tubers were small with almost none in the lower regions. We added layers to the boxes as the plants grew and as recommended, but this had no major effect. For watering, we installed four olla pots in each box. This also had no major effect. The layers were 5½ inches tall x 30 inches square built with cedar fence pickets.

Tower Fencing – Use 2x4-inch goat-wire fencing. This will hold the mulch in place and keep other critters out, like rabbits, opossums, and racoons. The openings should be large enough for planting the starter tubers in a circle around the circumference and the plants will grow out the sides through the fencing. Use full 48-inch high fencing. The recommended 10-foot length creates about a 24-inch diameter.

Vole Protection – The bottom of the vertical container must be sealed against vole intrusion. One-inch steel mesh keeps them out. For the bottom of towers, cut a suitable square to the diameter dimension and attach to the vertical fencing with wire ties. The bottom will be separated from the tower during harvest. Add 12 inches of the mesh around the bottom of the wire tower. Overall, no gaps for voles.

Hint – Steel mesh comes in 24-inch width so build the tower with a 24-inch diameter.

Mulch – As not detailed in other sources, this is your standard garden soil mix—the same as in your horizontal garden beds.

Mulch Containment – Without some sort of barrier, the garden soil mix will leach out of the fencing. Straw is much better than hay. It holds its shape, holds less water, and does not deteriorate.

Hint – If you’re growing strawberries, they get uncovered from their winter straw mulch right when it’s time to assemble potato towers. Two uses from the same straw.

Irrigation – Potatoes need water about every two-three days. Use a hose to deep soak on all sides. As each layer is assembled, deep soak the planting soil and starter potatoes.

Harvesting – When the plants die off, harvest these to your compost and keep up with the irrigation for about two additional weeks. Release the tower from the rebar and push it over. If not already in a garden bed, do so over a tarp and harvest the tower soil to another bed. For storage, use the same procedures as with field potatoes. Expect about 20 pounds of tubers per tower.

Materials and Tools – 24-inch Diameter Tower

Fencing – 10 feet	Mesh – 7 feet	Rebar – 6 feet
Plastic Wire Ties – 11 inch / UV	Fencing Wire – 19 gauge	Straw – Half Bale
Hammer	Wire Cutter	Fencing Pliers

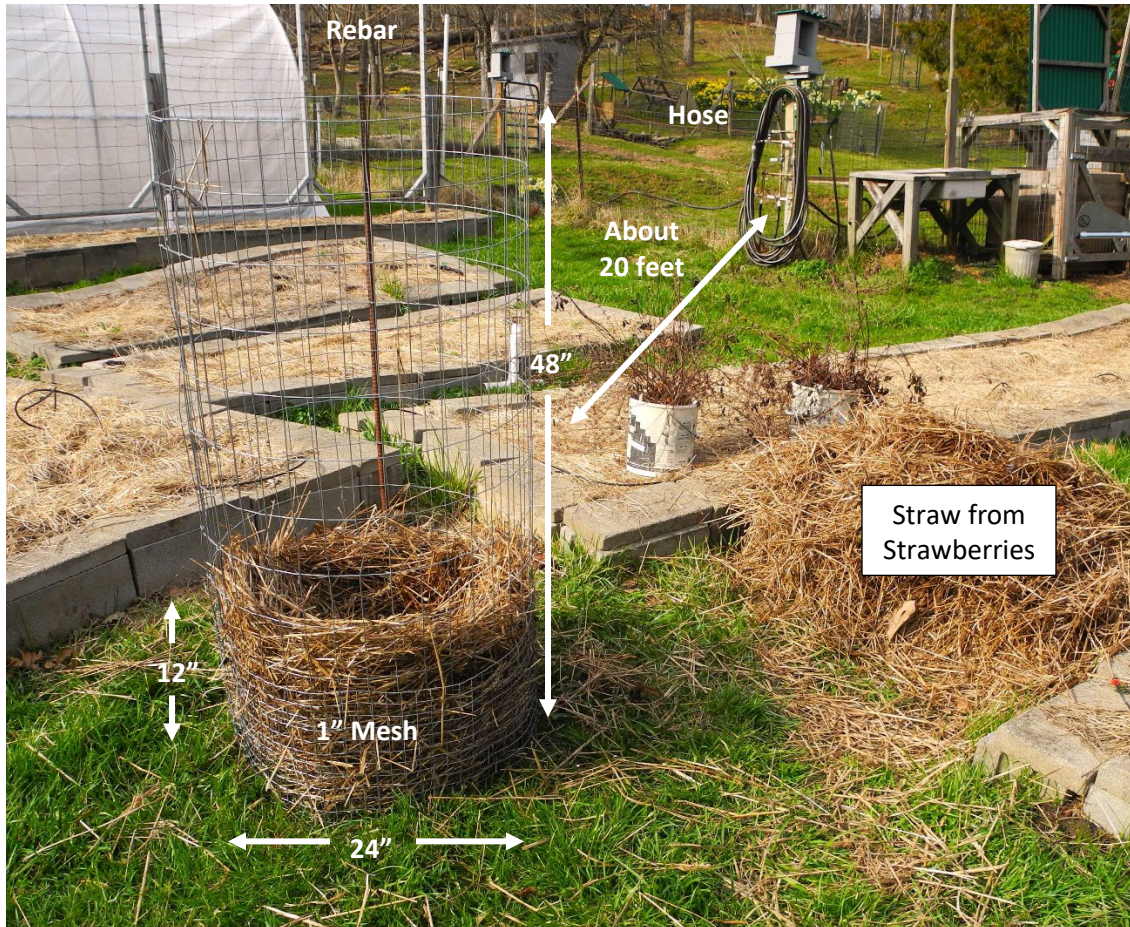
Assembling the Tower

Step 1	Roll out and cut the fencing. Bend back all tabs. Keep the curl.
Step 2	Carry fencing, rebar, and tools to installation site.
Step 3	Stand up the fencing and overlap about four inches. Secure with fencing wire.
Step 4	Situate the tower and pound the rebar about two feet deep on the outside.
Step 5	Secure the tower to the rebar with plastic wire ties.
Step 6	Cut a 24-inch square 1x1-inch mesh. Bend back all tabs. Place under the tower.
Step 7	Cut about 5 feet of 24-inch wide mesh. Trim to 12-inch width. Bend back all tabs.
Step 8	Secure the mesh to the tower and the bottom barrier mesh with plastic wire ties.

Preps for Planting

Step 1	Obtain starter potatoes and expose to sunlight to initiate budding.
Step 2	Obtain straw or harvest from other winter mulching.
Step 3	Drop enough straw in the tower for a 6-inch bottom bed.
Step 4	Add enough straw to build up about a 12-inch high by 3-inch thick outer wall.

Step 5	Add your normal compost garden soil mix to fill the bowl.
Step 6	Add starter potatoes in a circle about 4-inches from the tower fencing. Place potato pieces about 6-inches apart, cover with soil, and eyes facing out.
Step 7	Build another bowl and repeat until reaching the top of the tower.
Step 8	Cover the top bowl with soil and evenly space starters. Cover with soil and straw.



Vertical Tower Set-Up. All of the straw was used—about one full bale.

Select a site within easy reach of a hose and with full sunlight on all sides.



Bottom Tier Bowl. Sides about 10-12 inches tall.



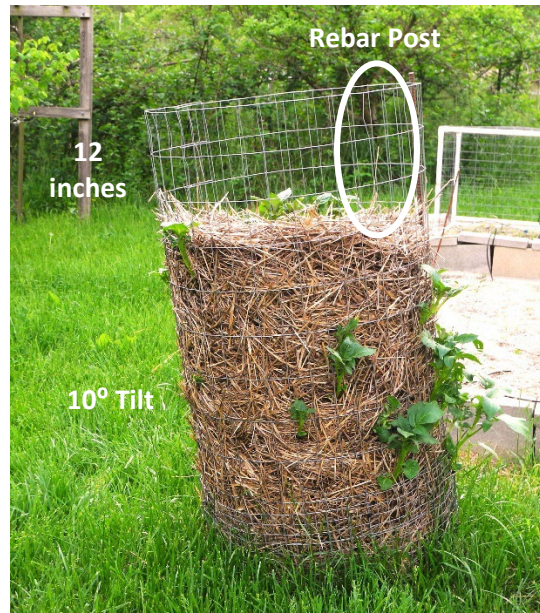
Bottom Tier Planted. Eyes are pointed to the outside.

March 14, 2024

May 3, 2024



Completed Tower. Four layers plus the top layer.



Soil and straw compressed by 12 inches.

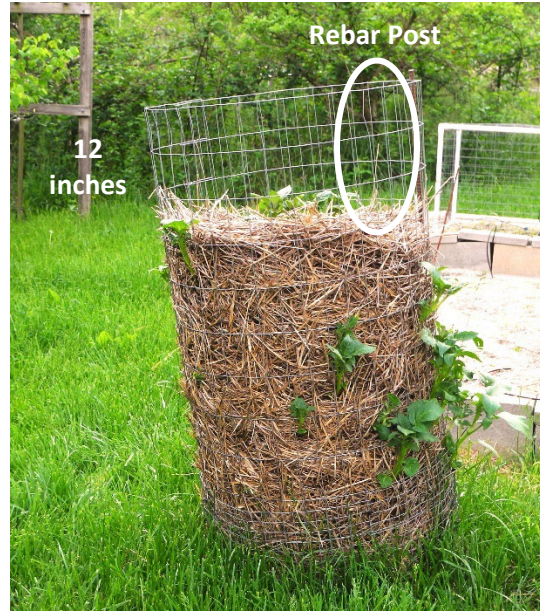
Recommend at least two and likely three rebar posts to keep the wet and heavy tower vertical.

March 14, 2024



Completed Tower. Four layers plus the top layer.

May 3, 2024



Soil and straw compressed by 12 inches.

May 25, 2024



Plants Growing Out. On the sunny side. Half as much growth on opposite side.

May 25, 2024



Comparison to Field Potatoes. Planted at the same time as the vertical tower. Early on the left and storage on the right.

Starting in early June, the 2024 la Nina heat condition negatively affected all potato growth with the plants dying off one month early.

Early Potato Yield:	Mid-June	Normal Temp and Rain	25 lbs in 4 x 10 ft area
Storage Potato Yield:	Mid-July	High Heat and No Rain	26 lbs in 4 x 20 ft area

July 24, 2024



Pre-Harvest. About 40% contraction in the tower.

July 24, 2024



Harvest Yield. 10 lbs with the largest found at the bottom of the tower nearest the soil.

There was little decomposition of the straw and the garden soil was the same as when installed. There was no compaction of the soil.

Findings

Plant Growth	Uneven	Not possible to get full sun on north and south sides of the tower. Better growth on east and west sides
Tuber Size	Uneven	Tubers found toward the top of the tower were half the size of those on the bottom next to the soil. It appears that soil nutrients could not mature and migrate up the tower to those in upper tiers. This is the same as when attempting vertical growing in square boxes with the largest found at the bottom.
Tuber Yield	Poor	10 lbs of tubers with many smaller than expected. If tubers had matured the yield would have reached the expected 25 lbs.
Weather	Poor	Excessive heat may have been a factor which would affected water retention and evaporation. This was coupled with six weeks of mostly no rain.

Tower Integrity	Unexpected	The original article did not show nor mention that the combination of straw and garden soil would contract. By harvest time it was half the original height. When the surrounding fence was removed, the tower retained it's shape. It did not need to be tipped over. During the growing season, the tower leaned toward the downhill side on the marginal slope. Additional support was not needed.
Vole Intrusion	None	One-inch steel mesh underneath and surrounding the bottom 12 inches of the tower stopped all intrusion. There was no vole damage to the tubers.
Watering / Irrigation	Marginal	No matter the amount of water applied around the outside of the tower, it still flowed downhill. Gravity pulled it to the bottom where the best tubers grew.
Soil Integrity	Marginal	The soil retained its friability as loose and loamy in the same condition as at the start. There was no worm and very little other insect presence. It is likely that microbe, bacterial, and fungal activity was minimal.
Soil Salvage	Marginal	When breaking down the tower, there was such a mixture of straw and garden soil that the soil could not be salvaged for elsewhere in the gardens. It was all added to the compost for rejuvenation.

Conclusions

Vertical growing of potatoes remains an unsolved gardening prospect. There is much better controlled growth and yield from horizontal growing over vertical growing.

Contraction of the soil in the tower was not expected. Perhaps yield could have been increased with the addition of garden soil to the top of the structure, but this is where the soil retained the least water. It is unlikely that this would have resulted in any substantial increase in yield.

For those with limited garden space, vertical growing with this technique has the potential for adequate yield but this would require adaptations on this technique for particular situations. High yields should not be expected without further adaptations to this technique.

In comparison to horizontal planting, issues with water and gravity are minimized. Water retention and evaporation are greatly assisted in horizontal gardens with hay mulch instead of straw as in the tower.