FROM BALE TO BOWL

Hayly and Alison's Strawbale Project

Why grow in straw?

The benefits of strawbale gardening include

- Bales make gardens more accessible, less bending required
- No digging, soil is created, mobile, inexpensive
- Highly ornamental
- Low-maintenance
- Organic and compostable
- Good for growing in low square-footage areas

Week 1 - January 17

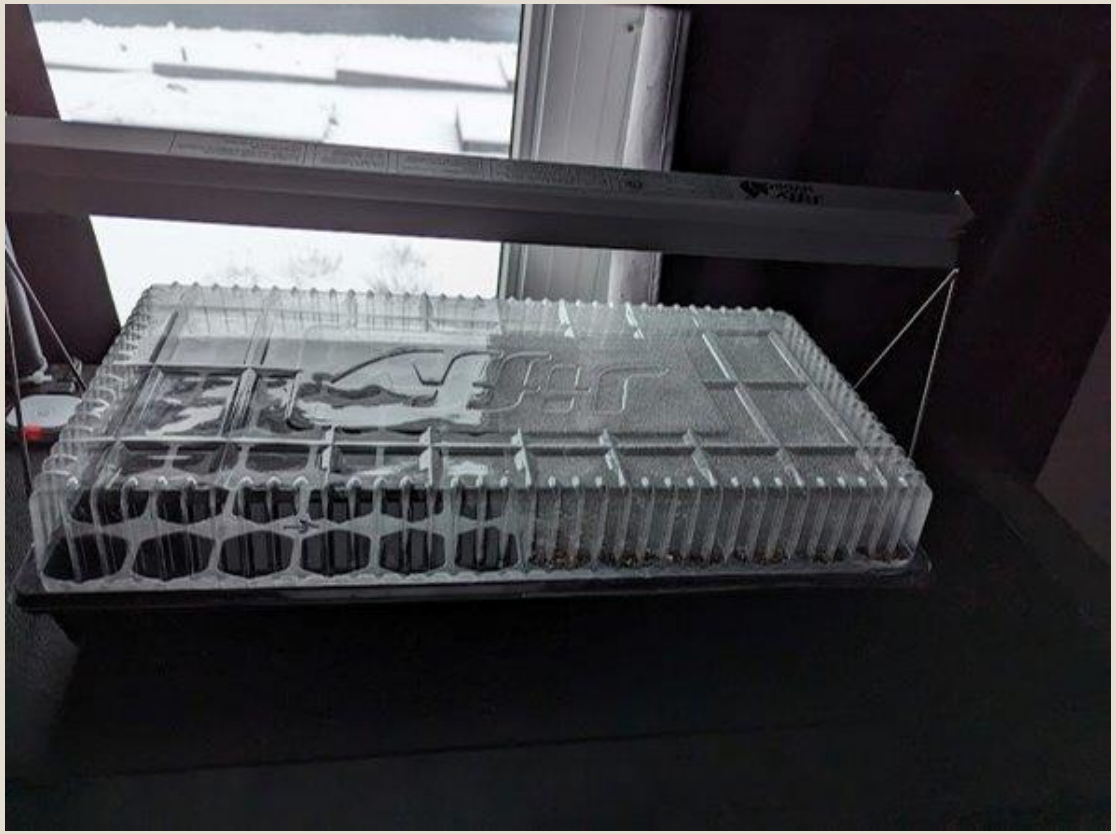
- Start process – dug out straw, mixed 1:1 with compost, put mixture back in and watered well
  - Did this to the top of the bale and to a few small pockets on the sides of the bale
- ¼ c of urea, high N fertilizer added to start breakdown
- Covered with a heavy black pastic tarp to trap in moisture and heat to accelerate decomposition

Week 2 & 3 – January 24 - 31

- Bale was periodically watered and covered with tarp, tried to keep warm to encourage decomposition
- Could feel warmth as decomp started, compost would have helped adding microbe population
- Seeds were started indoors to get a head start on our bale-to-bowl idea

Seed Starting

- Our goal was to only plant edible plants, in the end creating a strawbale the looked good and tasted good as well.
- The problem with this being that lots of good-for-a-salad-bowl plants have a long seed to harvest time
- Chose plants that were 65 days or less, with exception of the Blue-Podded Shelling Pea which will provide lots of blooms long before the peas are ready to harvest
- Started excessive amount of seeds due to seed age



Initial Plant List

- Gold Nugget Tomato - Solanum lycopersicum 'Gold Nugget'
- Tess's Land Race Currant Tomato - Solanum lycopersicum
- Straight Eight Cucumber - Cucumis sativus
- Boothby's Blonde Cucumber - Cucumis sativus
- Piccolino Basil - Ocimum Basilicum
- Baby Corn – Zea mays
- Ukrainian Dill - Anethum graveolens
- Red Spike Amaranth - Amaranthus blitum
- Rainbow Swiss Chard - Beta vulgaris 'Rainbow'
- Blue-Podded Shelling Pea - Pisum sativum
- Marigolds - Tagetes erecta

Week 4 – Feb 7

- Planted the seedlings that we had started (previous slide) and added a few more seedlings and seeds (next slide
- Planted many, probably overcrowded a bit, with the expectation that many might not survive or germinate due to seed age
- Expected things like colourful greens to fill the filler/thriller category, vining plants to be spillers, and some edible flowers and peas to be floral thrillers

Secondary Plant List

- Grape Tomato (from NSCC) - Solanum lycopersicum
- Oregano (from NSCC) - Origanum vulgare
- Arugula - Eruca sativa
- Tanya's Pink Pod Beans - Phaseolus vulgaris
- Blue Curled Scotch Kale - Brassica napus ssp. pabularia
- Red Russian Kale - Brassica napus ssp. pabularia
- Ruby Leaf Lettuce - Lactuca sativa
- Tango Leaf Lettuce - Lactuca sativa
- Tango Red Leaf Lettuce - Lactuca sativa
- Bloomsdale Long Standing Spinach - Spinacia oleracea
- Lakeside Spinach - Spinacia oleracea
- Nasturtiums - Tropaeolum majus
- Calendula - Calendula officinalis
- Beets - Beta vulgaris subsp. vulgaris 'Conditiva Group'
- **NOTE: it was difficult to find any specific variety names for most of the plant lists**

Week 5 – February 14

- Germination!
- Continued watering, had at least one Steinernema feltiae watering for fungus gnat control

Week 6 – February 21

- Plants keep growing, **many** mushrooms developed
- The mushrooms were **NOT** part of our bale-to-bowl plans, they are just a natural part of decomposition. We would be careful to let anyone know viewing or consuming our bale-to-bowl project to not consume the mushrooms or any other wild mushrooms without talking to an expert first.

WEEK 7 – FEBRUARY 28

Peas doing well, lettuce not taking off yet.

Week 8 – March 6

- Ongoing growth, added a handful of slow release fertilizer around this week
- We noticed yellowing on the leaves of the heavy feeders (cukes, tomatos), indicating they likely needed some more nutrients and added some more fertilizer
- As material in the soil is freshly decomposing it can make Nitrogen hard for plants to access, leading to chlorosis

Week 9 – March 13

- March Break, bales watered by Bonnie, and we were thankfully able to return and water them the week after.
- There was beginning to be more sun during the day and it was becoming warmer in the greenhouse, so some of the plant growth finally took off.
- It had been very gloomy and cold, and even though the plants were inside the lack of sun impacted the growth rate.
- Our bale also sat next to the outdoor vents and appeared to dry out faster, however the side of the bale that sat next to the neighboring bale (little airflow or sunlight there) remained almost constantly moist.

Soil Microbes and the Food Web

Nutrient Cycling

- Beneficial microorganisms (bacteria and fungi) harvest nutrients from soil, organic matter, and from the rocks, sand, silt, and clay in the soil
- The by-product nutrients are then absorbed by plants through their root systems
- Plants put back 30-40% of the sugars they make in photosynthesis into the soil to feed the microorganisms that in return send them the previously mentioned essential nutrients
- https://www.soilfoodweb.com/how-it-works/

Nutrient Cycling Imbalances

- When there is too much material that is yet to be composted in a soil (such as straw, uncomposted manure, etc.) then that can lead to nutrient imbalances
- Anaerobic Decomposition can take place by the microorganisms and actually decrease the availability of nitrogen to the surrounding plants
- We believe we noticed this issue (minorly) with our strawbales and added Nitrogen fertilizer to combat it
- https://aggie-horticulture.tamu.edu/earthkind/landscape/dont-bag-it/chapter-1-the-decomposition-process/

Week 10 – March 20

- Added in strawberries (Fragaria x ananassa ‘Pineberry’), lettuces take off, more weird mushrooms are growing

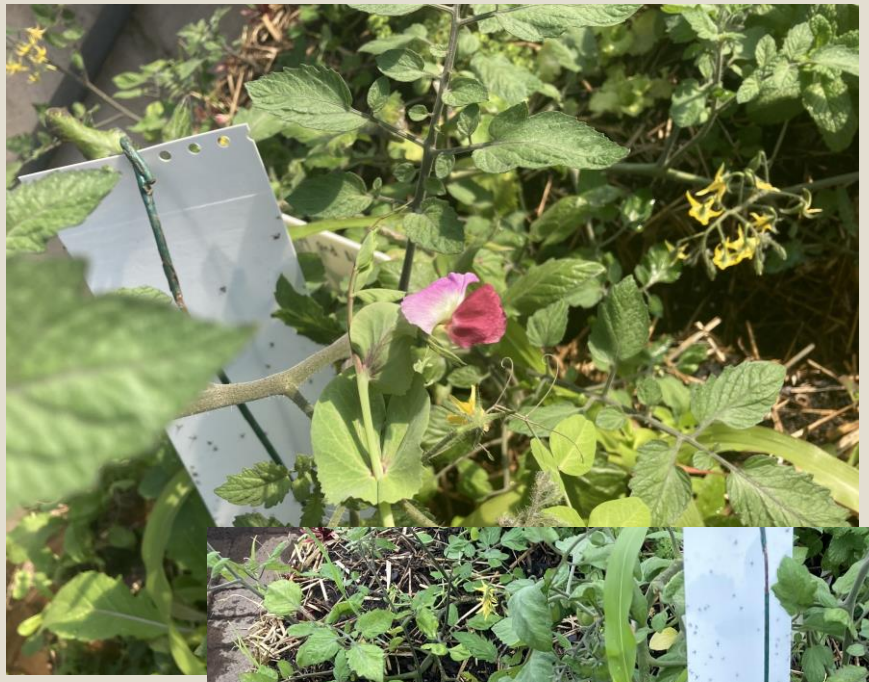
Lots of mushrooms

Week 11 – March 28

- Big changes, lots of growth
- Can see that peas on facing size not as large or growing as well as ones on the ends, perhaps because they are drying out

Week 12 – April 3

- Lots of great growth, flowers on peas and strawberries, lots on tomatoes
- All the bales experienced issues with fungus gnats, but we observed (after being highlighted by Michelle) the problem was heaviest on bales that did not plant any peas or beans



Conclusions

- Strawbales easy but not fool proof, requires some knowledge of plant nutrition and the impacts of decomposition on nutrient uptake
- Some plants (basil) didn't do well, as might have been too wet, not warm enough yet, or perhaps just too much competition
- The tomato seedlings we planted might have failed to thrive as no consistent moisture and they did not have as strong a root system as the larger tomato transplant from NSCC
- Have to watch for fungus gnats, definitely would want this project outdoors if growing at home
- The straw can get grass and weeds seeds, so some weeding was required
- Fertilizing is vital as decomposition process will use the available Nitrogen
- But overall, fun, easy and convenient