

FGF WHEAT INCUBATOR



Incubator: Payman Sattari
Program: Heirloom Grains

Seed Source: Sustainable Seed Co
Seed Variety: Organic Sonora Wheat
Quantity: 20lbs

Seeding Date: 04/04/15
Harvest Date: 08/01/15 - 08/08/15
Yield: 65lbs seed, 40gal chaff + straw

SUMMARY & OBJECTIVES

Twenty pounds of organic Sonora wheat seed was purchased for this incubator. One parameter for the project was to process a wheat crop without the use of chemicals or machinery. The intention was to determine the feasibility of growing wheat for personal use on a farm or homestead without significant financial investment or need for sophisticated machinery. The Sonoran variety was selected for its nativity to the California climate, drought resistance and its status as an heirloom crop. The following are some objectives I set out at the inception of this project:

1. Become familiar with the whole wheat life cycle from seed to harvest.
2. Determine the feasibility/practicality of farming wheat without the use of machinery including the proper use of hand-tools (scythe and sickle) and hand-processing (threshing and winnowing).
3. Learn about baking with fresh-milled flour (if there is any difference).
4. Improve my bread-making skills.

GROWING

Seeding

All 20lbs was seeded in 2½ rows at the far end (closest to the commercial kitchen) of farm plot 1. Though it may not be essential information, it's interesting to note that seeding coincided with a full lunar eclipse on 04/04/15. Seeding was done by broadcasting by hand with the help of 3 WWOOFers (coincidentally all French) and then covering the seed with a layer of dirt.

Irrigation

The wheat was irrigated with sprinklers that were set up along two of the three rows and connected to the main irrigation pipe for the rest of the plot. The first watering occurred one week after seeding and thereafter on the same schedule as the rest of the crops in plot 1. Irrigation stopped about one month before harvest (when plot 1 was no longer being irrigated).

Weeding

The idea that the wheat would crowd out the weeds (because it grows like a grass) probably would have been true if the seeding was done more effectively (letting the weeds grow, turning the soil, then seeding for example). The 3 weeks I was away were arguably the most crucial in the wheat's growth in that it's when the wheat 'shot up'. The weeds also shot up at the same time so much of the wheat grew 'leaning' on the weeds. This made weeding very difficult and much more time consuming. Weeding took about one month to complete.

HARVESTING & PROCESSING



Harvest

Initially harvest was done by hand with a scythe. Effective use of a scythe requires swinging in an 180 degree arc a few inches above the ground and slicing through the wheat in front of you in a smooth semi-circle. The two issues we came across were that first, we planted in rows so there wasn't enough wheat to cut through in the full 180° arc and second, we planted on raised beds that made it difficult to cut in a level arc above the ground. Consequently the rest of the harvest was more efficiently accomplished with a sickle.

Bunching & Drying

Wheat was bunched pretty much immediately after harvest, tied with hemp rope then placed in small pyramids to dry for 7-10 days. It's interesting to note that one cold night at the compound was enough for the wheat to absorb enough moisture for threshing to become difficult. Leaving the wheat in the sun for an hour or two would dry it out sufficiently to solve the problem.



Threshing

Threshing was done using two 20gal trash cans. Bunches of wheat were threshed into the first can by banging them against the side of the can. This process was repeated until the can was about $\frac{1}{2}$ full. The result was then cleaned to remove straw, stems, deseeded any heads that came off during threshing and just generally clean it up until it was only chaff and seed left. Next I would crush the resulting chaff and seed by putting large amounts between my hands and rubbing them together (to further separate as much husk from the seed as possible). When that was finished and everything looked clean, I would transfer it to the second can to be ready for winnowing.



Winnowing

Winnowing was a simple process of pouring the resulting mix over a fan and into another container. The results were pretty impressive with very little chaff remaining after the winnowing process (though I think this probably had to do with how well the mix was cleaned before winnowing). The seed was winnowed at least twice to be thorough and the resulting chaff was collected and put into containers for chicken bedding. The whole winnowing process was very quick, especially compared to threshing.



ISSUES / LEARNING EXPERIENCES

1. **Non-germination:** The first $\frac{1}{3}$ of the first row had very little germination. I can't say for sure what the reason is though I think it had something to do with the compacting of the soil because in this area even the weeds didn't grow.

2. **Seed spacing:** The wheat was planted too close together. The three rows were all planted at slightly different concentrations of seed. The row with the least concentration grew best. Granted that was also the row that got the best watering but it's clear the concentrations were a factor. Ideally the 20lbs of seed could have filled up closer to 4-5 rows.
3. **Row planting/beds:** The wheat that grew in the furrows was greener, taller and healthier than the wheat on the raised beds. I'm guessing this was due to access to water. Next time I would plant the wheat on even ground (which is also important for scything) and without rows.
4. **Lodging:** There was significant lodging in the areas immediately next to the sprinklers from the water pressure of the sprinkler heads (additionally there's a chance some lodging occurred due to high winds from the delta though I can't confirm this). While most of the lodged wheat continued to grow and produce seed, it significantly impacted the speed of harvest and threshing.
5. **Improper bunching:** When the wheat is bunched with the heads of the wheat not lined up with each other, threshing takes 2-3 times longer. When we bunched initially (not having threshed yet) we didn't know this and so more than half of the harvest was bunched this way. While it did not affect the yield, it significantly affected the speed of processing.

CONCLUSIONS / THINGS I'VE LEARNED

Things I've learned about growing: plant on even ground (no beds), broadcast evenly and without rows (unless machine-seeding), turn the soil and weeds once before seeding, water from the beginning, don't use sprinklers (maybe drip), stay ahead of the weeds (it can get away from you quickly), give your wheat lots of love (it likes it).

Things I've learned about harvesting: bunch no bigger than what you can hold in one hand comfortably, make sure all of the heads are lined up, make sure the wheat is sufficiently dry before threshing (even if that means drying them out again in the sun after a cold or moist night), thorough threshing means an easier time winnowing, seed is best kept in a hard plastic or metal container, seed is still viable for up to 7 years, make flour as you need it (maybe a week's worth) not all at once, chaff can be used for animal bedding, straw can be used for weaving, the golden color of wheat is unique (wheat is beautiful).

Cost/benefit considerations: Initial seed cost was \$1,000 at \$250/5lbs. Harvesting equipment (scythes and sickle) came out to around \$300 and processing equipment (the mill) came out to around \$500. ***Its safe to say that a small wheat field of around half an acre could be grown with about \$2000 out of pocket without the use of machinery and without the need for significant manpower.*** Even with the multitude of mistakes I made in growing (there were many), I still came out with about 65lbs of seed which if we value at what we bought it for (\$250/5lbs) comes out to about \$3250 worth. After milling 6lbs and taking 3.5lbs with me (including some of the milled flour), the farm was left with 55 lbs. To sum up, though the financial benefit was nominal, we came out of the project at least in the positive. Taking into account the learning experience of all involved and having threshed out (intentional wording) some of the infrastructure needed to continue growing, I feel the incubator was a success. :)

What I'm carrying forward from my experience at FGF...

A greater awareness of the importance of agriculture and its direct impact on my life. The importance of the purity of the food I'm eating for the smooth functioning of my body. The importance of eating local as much

as eating organic (active support for the local community is a part of progress). That eating via farmers markets rather than supermarkets is as much about variety in my diet as it is about the healthiness of the actual food.

The basics of seeding, weeding, transplanting and composting. How to make compost tea. More nutritional facts than I ever would have imagined about kale, beets, swiss chard, kohlrabi, radishes, squash and peppers. Some of the basic chemistry of soil composition and plant biology. Some of the basics of woodworking and path-laying. Better cooking and baking skills.

How to balance the relationship I have with myself with the relationship I have with others. A greater sense for how the generations of people younger than me feel about the world. The importance of taking care of my home to feeling grounded, and also that the space I share with others is just as much my “home” as the space I reserve for myself (my personal home). The importance of acting with integrity (finishing the last 5%).

I feel that the objectives I set out with my incubator were met and then some. It's hard to sum up what it is you feel you've learned when so many things become second nature after awhile and you forget that you learned them. I feel fortunate to have spent the time I did at FGF and want to express my gratitude to all involved for taking me in as a part of your family and sharing your space with me. I hope my presence was as much a boon in the life of FGF as FGF was in mine. Thank you. :)

- Payman