

# sunroot gardens

## STAPLE FOODS REPORT 2008/09

- I. Introduction
- II. Financial & organizational model
- III. The Plots
- IV. Methodologies & Yields by Crop, 2008
- V. Methodologies & Yields by Crop, 2009
- VI. Conclusions
- VII. Notes
- VIII. Photos

### I. Introduction

Sunroot Gardens is an urban agricultural effort based in the Southeast quadrant of the City of Roses, Cascadia, under the gaze of Wy'east. Sunroot Gardens has operated as a CSA (Community Supported Agriculture) enterprise since 2007, utilizing back/front/side-yards, empty lots, and public rights-of-way for growing vegetables, fruits, and medicinal herbs. Famously<sup>1</sup>, this network of gardens was discovered and developed by bicycle, and bikes have remained at the heart of travel and transport for Sunroot.

In 2008 and 2009, Sunroot attempted to grow various grains, pulses and oilseeds under the auspices of “the Staple Foods Project”. While the goal in both seasons was to grow enough food to feed some number of people for some portion of the year, it ended up functioning merely as a research project. Yields were consistently lower than hoped for, and the logistics of harvesting and processing proved more difficult than suspected. Over \$15,000 was spent, much of it out-of-pocket for the farmers.

The Project has been extended into a third year, 2010. We have included our projections and plans for 2010, which has entirely different logistics and circumstances, in the “Conclusions” section of this report.

This report from the Staple Foods Project is intended to give an unvarnished, unsentimental, just-the-facts-ma'am view of our experiences over the last two seasons. **The Staple Foods Project is not intended as a “model”.** There are no “models” -- there is just life, in front of us, and there is nothing to do but live it, whether we'd like to admit this or not. We are not interested in entertaining the intellectual and emotional illusions that permeate the whole of the “Sustainability” movement, so herein we offer these facts, figures, and observations only as a record of what we saw in front of us.

### II. Financial & organizational model

Sunroot Gardens was founded by Farmer K in 2007 as a CSA farm, an arrangement in which people pay \$ to the farm up-front, and receive produce throughout the following season. Recognizing that produce – as in vegetables and fruit -- comprises less than a quarter of the typical contemporaneous human diet, and that the majority is made up of grains, pulses, and oilseeds/nuts (with the addition of animal protein for many people), Farmer K saw a need to expand Sunroot's efforts. Thus the formation

of the Staple Foods Project was announced in 2008. A budget was created:

<b>LINE ITEM</b>	<b>AMT, US\$</b>
Land-lease (\$100/acre/year)	200.00
Soil Test	33.00
Seeds	493.61
Cover Crop Seed	280.56
Amendments	600.00
Tools / Equipment for Planting / Cultivating	397.60
Harvest / Processing	544.95
Incidentals, including fuel and LIWHWYMOP (Life Is What Happens When You're Making Other Plans) aka unforeseen costs	350.00
<b>TOTAL:</b>	<b>2549.72</b>

Ten shares, at the cost of \$250.00 each (~10% of the total), were made available. All were sold within two months of the Project's announcement.

Recognizing that labor is as important as \$ with an agricultural project, the final harvests for 2008 were divided as such:

- 40% to the \$-shares (with each share receiving 10% of that 1/3)
- 40% to the helpers (divided in proportion to number of hours worked)
- 20% to the farm (for the farmers' tables, and for seed for the following year)

Actual costs exceeded the total by over \$5000, due mostly to the purchase of a tractor:

Tractor (1958 35hp Massey-Ferguson, red):	\$3500
Tractor repair:	\$600
Tractor upkeep:	\$500
Additional amendments:	\$250
Additional covercrop seed:	\$200
Additional LIWHWYMOP (est.):	\$800

These costs were covered by Farmer D, Farmer K's partner farmer in the Staple Crops Project that year.

**For 2009, a larger budget was created:**

Land-lease (\$100/acre/year)	<b>200.00</b>
Seeds	<b>560.00</b>

Cover Crop	<b>641.10</b>
Amendments	<b>1000.00</b>
Tractor upkeep, repair, etc.	<b>1000.00</b>
Harvesting / Processing	<b>375.00</b>
Incidentals (incl. LIWHWYMOP)	<b>425.00</b>
<b>TOTAL:</b>	<b>4201.10</b>

Ten shares were offered at the price of \$420.11 each.

Because the 2008 yields were so low, \$-investors from that year had their shares extended into 2009. The divvying up of final harvests was calculated as follows:

- 15% to the 2008 \$-investors
- 35% to the 2009 \$-investors
- 25% to the helpers
- 25% to the farmers

Actual costs for the 2009 season exceeded those budgeted by at least \$3000. These costs were covered by personal investments from two of that year's four farmers. The over-runs were for additional amendments and seed, which was no surprise, but also for equipment costs related to the wheat harvest, which were unforeseen.

**For 2010**, the budgets of the produce CSA and the Staple Foods Project were combined, so the Staples costs were to be some portion of the entire 2010 Sunroot Gardens budget, which is \$10,000. Those who wished to invest in the 2010 Staple Foods Project named their own amounts, and the investor portion of the harvest will be distributed proportionally among them. Additionally, a five-figure chunk of cash has been made available to the Project for 2010 by an anonymous “angel” investor who is not seeking anything in return for their investment. The disbursement formula for 2010 is undecided but we hope to offer shares to the community \$-investors that exceed previous shares by factors of at least 50-100.

### **III. The Plots**

In 2008 and 2009, the Staple Foods Project was grown on two main plots: “Carver” and “Bailey's” (formerly “Hampton”). Unless otherwise noted, the various crops were dry-farmed, with no irrigation except rain and field moisture. We generally used the crop-spacing recommendations for dry-farming made by Steve Solomon in “Growing Vegetables West of the Cascades”. In some instances, we found we could crowd plants more than he suggested.

The main soil amendment used was AZOMITE, given its relative low monetary cost for the perceived benefits conferred. Bailey's was also limed lightly in 2009, and the corn and some beans there received compost tea. The compost tea was applied by in two ways: foliar feeding with a hand-held sprayer and root-zone irrigation with hand-drilled holes next to individual plants.

## **CARVER**

Carver was two acres outside Carver, which is between Oregon City and Damascus, just outside of the Portland-metro Urban Growth Boundary. The land itself was alluvial bottom-land, tucked into the north-then-south bend of the Clackamas River shortly before it spills into the Willamette. The area had been conventionally farmed by another lesee-farmer from time out of mind, and the effects of his heavy machinery and chemical-dependent methodologies were obvious.

The soil was a lifeless, airless clay that made mad muck in the wet winter and dried to a concrete-like consistency in the summer. No worms were to be found. Adjacent plots covered in blooming mustard were the home to no insects that could be seen. A hammer and chisel were needed to extract a soil sample in 2009, and the chisel broke.<sup>2</sup>

The \$100/acre/year arrangement for two acres was initiated by the residents of the farm (who did not farm it themselves) who were wishing to push back the conventional farmer from their house so his spraying wouldn't be so close. It was contractually agreed that Sunroot would be using "sustainable" methods that would not harm the residents.

Going into 2008, the two acres were already seeded with an overwintering wheat crop which Sunroot chose to leave and harvest that summer. An early attempt to till some of it under with rototillers (after hoes proved to be grossly adequate) and seed soup peas led to discoveries about the unworkability of the soil, at least with such unburly equipment and at that time of year. Just letting the wheat go seemed the path of least resistance. Going into 2009, we were given two different acres, again already seeded with wheat.

AZOMITE was the only soil amendment used at Carver in both years.

## **BAILEY'S (formerly HAMPTON)**

Hampton was 1 ¾ acres in Milwaukie (the next town south from Portland within the same urban contiguity) that was owned by the brothers who ran the convalescent home next door. In 2008, arrangements had been made by another pair of farmers to farm the land, and Sunroot was invited to share the space since they wouldn't be using all of it. For 2009, Sunroot took over the entire piece.

The land was south-facing and uphill from the railroad tracks, and had never been built up. Horses had – perhaps – been pastured on a portion of it; otherwise it had been fallow since forever, just getting mowed by the brothers. The vegetative life there was mostly grass and Queen Anne's Lace and other regional pioneers, with some thistle and blackberry. The tilth was quite decent. A creek bed followed one side of the field, running in 2008 but dry in 2009.

"Hampton" was named after "Mr. Hampton", a cat who lived with the couple who brought us to the plot. "Bailey's" was named after the dog next door, who would often bark at us to play. One day in 2009 he got to come run around in the field, and that's when we found out what he was called, and were able to more properly name the plot.<sup>3</sup>

## **OTHER PLOTS**

Other plots also played host to Staple Foods Project crops, mostly in the form of compact urban plantings for seed grow-outs for later field sowings. These will be mentioned on a crop-by-crop basis.

#### IV. Methodologies & Yields by Crop, 2008

In 2008, the Project's food crops were:

- Wheat
- Quinoa
- Cannellini soup beans
- Oilseed sunflowers

and the seed crops were soup beans and flour corn.

#### WHEAT

At Carver, we had 1/3 acre of wheat available to us. The remaining of the two acres was fallow or under peas. Over the course of two weeks, we harvested and processed over 600 lbs. of wheat, using hand-methods entirely, with tools and equipment no more complex than tarps, buckets, fans, baskets, and racks. Meticulous record-keeping that year yielded the following summary of info:

#### ¶ STAPLE FOODS PROJECT: WHEAT SUMMARY ¶

<b>Total lbs:</b>	636
<b>minus COB:*</b>	22 lbs.
<b>To disperse:</b>	614 lbs.

\*\*\*Cost of doing business" = wheat dispersed to worktraders during  
harvest activities in the form of berries, flour and bread

#### DISBURSEMENT:

<b>Farmer share (20%):</b>	122.8 lbs.
<b>\$ Investor shares (40%):</b>	245.6 lbs.
<b>1(one) 40% share:</b>	98.24 lbs.
<b>6(six) 10% shares:</b>	24.56 lbs. ea.
<b>Worktrade Shares (40%):</b>	245.6 lbs.
<b>for gen. Lbr:**</b>	40 lbs.
<b>To wheat workers:</b>	205.6 lbs.
<b>lbs./hr to Worktraders:</b>	1 lb.

\*\*\*General Labor" = non-wheat Staple Foods Project worktrade hours

#### HOURS SPENT:

<b>All wheat work:</b>	245.5 hrs
<b>Worktrader time:***</b>	205.5 hrs
<b>Harvesting:</b>	142 hrs
<b>Threshing (est.):</b>	46 hrs
<b>Winnowing (est.):</b>	50 hrs

\*\*\*Total time minus the Farmer's time

#### PRODUCTIVITY:

<b>lbs./hr.:</b>	2.59
<b>Total # people:</b>	42
<b>avg (mean) shift length:</b>	3.5

## QUINOA

At Bailey's (then known as “Hampton”), we planted ten 300-ft rows of quinoa. The seed was our own, having been grown-out and saved since 2005.<sup>4</sup> The plants were big beautiful brothers, running a rainbow of flower, stem and leaf colors, making for a psychedelic display. We used about 5 lbs. of seed. **Our final harvest was 36 lbs.** A summary follows:

Task	Hours
Prep and Planting	56.5
Thinning	12
Farmer Inspection, over season	20
Harvesting	16.25
Threshing	24.75
Winnowing	14
<b>Total:</b>	<b>143.5</b>

**This is a productivity rate of ¼ lb. of final harvest per each hour of work.**

Like the wheat, this crop was processed entirely by hand. We found that the quinoa heads, once cut (and delivered to the Firepit from Hampton by bicycle caravan), needed three days to dry in the sun before they would thresh easily. This was during a hot dry spell and the heads were stacked pointy-top-down in teepees on jute coffee-bags laid over racks in the sun. The bags were there to catch the seeds, since some were falling off already.

No attempt to remove the saponins were made, since the only method we knew of was to soak and wash the seeds, and how would we get them dry from that, in such a large quantity? Instead, receivers of the seed were instructed to clean them before consumption. We suspected that these bitter-tasting saponins, which discourage predation by birds and insects in the field, would also protect from rodents and bugs in storage. So far, no reports of moth-eaten or rat-raided quinoa have been reported.

The overall harvest from the quinoa was so small that the Farm reserved a larger-than-20% share of it to have a good supply of seed for the next year. The \$-subscribers all received one pound per share.

## CANNELLINI SOUP BEANS

At Mall56 we seeded a few pounds of Cannellini soup beans. We had ordered from Italy, thinking: if we have to live on beans, they might as well be gourmet. Cannellini has often been called “the best” soup bean. We planted rows about 18 inches apart, with plants thinned to 8-10 inches apart within a row. We used a legume inoculant from Johnny's Seeds.

The 30'x70' plot had been lawn grass until then. We tilled it under with a rototiller on May 7<sup>th</sup>. (Sunroot has kept on file some fun cellphone video of Melanie Plies, of Backyard Booty CSA, turning the 350+lb. Troybilt around on the tight passes.) We broadcast buckwheat seed out after the first of three passes. Rains brought up the buckwheat, which choked back the grass.

We seeded the beans on June 27<sup>th</sup>, after tilling in most the buckwheat. We harvested the majority of the beans on Sept. 28<sup>th</sup>, and threshed and winnowed them on Sept. 30<sup>th</sup>.

**Final harvest was 30 lbs. A summary of work:**

<b>Task (by hand, unless otherwise noted)</b>	<b>Hours</b>
Field prep (with a rototiller)	8
Planting	6
Thinning/Weeding/Watering (est.)	12
Harvesting	9
Threshing/Winnowing	2 1/2
<b>Total:</b>	<b>37.5</b>

**This is a productivity rate of about 12 oz. of dried beans per each hour of work.**

## **OILSEED SUNFLOWERS**

An eighth of an acre were planted at Hampton. Those within 100' of the creek were eaten by nutria. Those planted further away were seeded too late into a particularly infertile patch and yielded what could be accurately described as “squat”.

## **OTHER CROPS IN 2008**

- “WTO Corn” at the Firepit Garden. From the three ears that were produced by 18 seeds planted at Old Lemon Balm in 2006. Those 18 seeds were from another local gardener, saved the previous-or-so season. That person got their original seeds from a Mexican farmer during the 2003 WTO Protests in Cancun, where a Korean farmer famously stabbed himself to death atop the security fence around the summit to express the plight of traditional small farmers under pro-corporate policies imposed by the WTO. Final harvest: a couple hundred ears, all kept by the farm for seed for 2009.
- “Black Valentine”, “Pink Floyd”, “Tiger Eye”, “Yin-Yang” and other soup beans, at various urban plots around Southeast. “Black Valentine” has been grown out and saved in varying amounts every year since 2005. Final harvests ranged from 5-20 lbs. per variety.

## **V. Methodologies & Yields by Crop, 2009**

<b>Crop</b>	<b>Location</b>	<b>Amt. planted</b>	<b>Amt. harvested</b>
Wheat	Carver	1 1/3 acres	700 lbs.
Quinoa	Bailey's	1/4 acre	50 lbs. (est.)
Taylor's Hort. soup beans	Bailey's	six 300' rows	90 lbs.

Crop	Location	Amt. planted	Amt. harvested
Flax	Bailey's	30'x30' broadcast	8 ½ lbs.
Dry Corn	Bailey's	¼ acre	hundreds of ears
Millet	Bailey's	20'x20' broadcast	29 ½ lbs.
Buckwheat	Bailey's	1/3+ acre	105 lbs.
Soldier soup beans	Bailey's	eight 60' rows	22 lbs.
Hidatsu soup beans	Eel Skin Mad's	patches, 3 sisters	near failure
Popcorn	Eel Skin Mad's	patches, 3-sisters	6 lbs.
Black Valentine soup beans	Sewell	25'x25' broadcast	small
Cannellini soup beans	Sewell	25'x25' broadcast	small
Urid dal bean	Lovina	two 30' rows	lost
Urid dal bean	Bailey's	one 40' row	decent seed crop
Kenyan beans	Lovina	two 30' rows	failure
Kenyan beans	Bailey's	one 50' row	1 plant made beans
Pink Floyd soup beans	110 <sup>th</sup> /112 <sup>th</sup>	25'x75' broadcast	eaten by deer
Quinoa	Carver	30'x30' broadcast	failure
Buckwheat	Carver	40'x75' broadcast	six plants grew up
Oats, hullless	Carver	125'x75' broadcast	a few breakfasts
Fava beans	Carver	40'x75' broadcast	stunted
Flax	Carver	60'x75' broadcast	5 lbs.
Cannellini soup beans	Echo's Farm	¼ acre, rows	beaten to punch by rain
Amaranth	Bailey's	10'x40' broadcast	not harvested

Details on selected crops follow. Inquire with Sunroot Gardens for more information.

## WHEAT

The wheat harvest was, in Farmer D's words, “**a clusterfuck**”. 2008's two week from-beginning-to-end process was replaced with a six week ordeal of wasted time, too many car trips, poorly thought-out methods, a distracting tool-fetish<sup>5</sup>, and a lack of both communication and cohesion. The resulting processed harvest of merely 700 lbs. (compared to 2008's 636 lbs. on ¼ of the same area) was, honestly, pathetic.

I, Farmer K, felt daunted by the task of harvesting and processing what was a potential harvest of over two tons, and so delegated the “pack leader” role to someone else. This was an amazing opportunity for him, as he was very new to farming, and such a large project can provide a wealth of practical experiences in a short amount of time. Certainly, I doubt if any local farm but Sunroot would have



given so much responsibility to a “rookie”, but then again, what were any of us?

The project began, and in some ways ended, with scythes. \$250 was invested in ordering scythes from an Austrian company that had been making them since the 1700's. Apparently, no one in the U.S. makes good scythes anymore, which is no surprise at all considering the general dearth of equipment and tools for small-scale grain growing. (More on that subject later.)

The scythes worked fairly well for bringing down a lot of wheat in a relatively short amount of time. However, what this left us with was heads on long stalks. The previous year we had hand-harvested just the heads, stomped them on tarps, winnowed them with fans, and called it done. The addition of the stalks to the process was a complication.

In an attempt to deal with the huge windrow of cut wheat that collected in the field – which we couldn't process by our previous methods – two machines were brought in. The first was a thresher made by modifying a chipper. The second was a winnower fashioned from a bunch of stovepiping and a leaf blower. Both machines ran (loudly) on gas-powered engines. The thresher worked okay when fed just the right way, but broke a large percentage (about ¼) of the wheat berries. This damage leads to their fairly immediate nutritional degradation, and leaves them more vulnerable in storage. Hundreds of dollars and many many hours were spent trying to set up and make these machines work.

Reflecting on the process later, I saw two points where I could have intervened: first, calling off the scythes would've left more to pick by hand in the field, giving us a form we knew what to do with. (This was the fetish -- with the scythes; yes, people “look cool” when they use them, but that's not enough reason to keep using them when they are creating a bottleneck.)

Secondly, later came a day when I did a timed test with a hand-harvesting and processing method. I used my chamomile rake (which we had been using to harvest flax) to remove spikelets (the wheat heads), which went about 10x faster than removing them by hand the year before. I collected the spikelets in a yellow plastic recycling bin, where I threshed them by stomping on them. Then, up at the house, I set up a fan on a chair and winnowed bucket-to-bucket. In fifteen minutes total (harvest-winnow), I had 7 lbs. 11 ½ oz., a rate of about 30 lbs. per hour. I had originally envisioned the making of a “Gallic Reaper” for spikelet removal, which is a 2000 year old piece of Roman technology. The chamomile rake was a miniature Gallic Reaper in design, and did indeed speed up the harvest considerably.

At that point, I had the feeling that I should remove the rookie from the project entirely, but I ended up letting it go by. Weeks later I saw that indeed this had been a vital juncture in the season's timing, at which a bigger harvest could conceivably have been gained had I taken control of the project and steered it firmly. Then again, who knows? All such speculation has limited (if any) utility.

To complete the clusterfuck, a volunteer stole 150 lbs. of wheat, so we had to rejigger the distribution amounts to assure investors and helpers got their due. Theft is likely to be an ongoing issue as socio-economic structures break down. Such incidents will be handled on a case-by-case basis depending on circumstances.

## QUINOA

Feeling that the 2008 quinoa planting was too sparse, we went the other way in 2009 and thickly broadcast a 300'x50' section at Bailey's. The planting was about two weeks on the late side (taking place near the end of May), the field didn't get thinned enough, and the heavy cold rains came about two weeks on the early side. The result: a preliminary harvest of 50 lbs. of the earliest maturing plants were all we got. The rest was ravaged by the black mold!

The quinoa grow-outs had always obviously been a collection of varieties, as shown by the different colors of the plants (though not of the seeds, which are white). I estimate that there were at least five distinct varieties, and that we got the seed of just one of them – the earliest maturing of all of them. We shall go with this seed, then, if we plant more in 2010. Having started as “Faro” from Seeds of Change, this localized selection has been named “Bailey's”.

## TAYLOR'S HORTICULTURAL BEANS

We planted these in long rows on the late side – must've been early July – but got a great harvest in September. The compost tea foliar feeding they got might have helped, though we had no “control” row. They were quick, productive, and fairly easy to thresh and winnow. Much of the processing was done on tarps right there in the field, the idea being to avoid moving large volumes of things around. (The car fatigue that both Farmer D and Farmer K felt after the wheat clusterfuck was weighing heavy at that time.)

The final harvest of 90 lbs. was quite decent, we felt.

Total harvest (lbs.)	90
Seed for farm (lbs.)	25
Total to distro	65

Farmer share	16.25
Helper share	16.25
\$-investor '08 (ea.)	0.98
\$-investor '09 (ea.)	2.28

## FLAX

Farmer M helped broadcast the flax seed. We had two varieties we let mix up: Brown Flax and Omega Flax, both from Horizon Herbs. We sowed them in late May. They quickly sprouted and took over, not leaving room for weeds (except a few blackberry brambles). We harvested three ways: with the chamomile rake, by hand, and by cutting them down. We threshed by stomping on tarps and winnowed with buckets and fans. The flax on stalks proved the most difficult to process, but made a fine “brown” component in a compost pile.

The biggest challenge with the flax was that a great number of seed heads were still green and immature while a great number were rattley-dried and ready-to-go – even starting to shatter and dump their seed. I found that the chamomile rake would collect the green ones up close to the tines, where

they could easily be picked or brushed off by hand, but this of course wasted them. Some green heads also got mixed with the dry ones anyway, and though they mostly separated in the threshing/winnowing, their presence added more labor. Immature flax seeds can be toxic, depending on how young they are, so you don't want them in the final product in a large amount (if at all).

Perhaps a better approach is to wait longer for fewer green heads, even at the loss of the earliest-to-mature. It is also possible that a different harvesting method could be employed, since the drier heads tend to be slightly higher on the plant.

Our intended crop was the seed, for its Omega fatty acids and other health benefits. Growing flax for fiber entails an earlier harvest of the stems, and apparently the processing is laborious.

Total harvest (lbs.)	8.5
Total harvest (oz.)	136
Seed for farm (oz.)	56
Total to distro	80
	oz.
Farmer share	20
Helper share	20
\$-investor '08 (ea.)	1.2
\$-investor '09 (ea.)	2.8

## THE DRY CORN

Farmer M joined the Sunroot Gardens Staple Foods Project as “Farmer” for the corn crop. He brought “Mandan's Bride” corn seeds with him, which he had saved from a previous planting. Sunroot had saved seed from three other varieties, Oaxacan Green Dent, Earthtone Dent, and the in-house “WTO Mexican” flour corn (see 2008 “OTHER CROPS” for more about that seed). Having heard that decent genetic diversity in corn seed will not result from a crop of less than 200 plants, and being that all four corn varieties had started from fewer plants than that, Farmers M & K decided to plant all four together and let them mix up. The idea was that all four varieties could be reinvigorated this way, and reselected the following year for what could eventually settle down into a new variety.

We planted about ¼ acre at Bailey's altogether. In addition to AZOMITE, we sprinkled fishmeal along our intended rows. We seed the area using “Seed Sticks”, from Johnny's Seeds. They are New England made tools that allow easy seeding without bending over. On a hollow stick about the size of a broom handle (which we guess they originally used when inventing this thing), is a hopper you fill with seeds. When you poke the ground with the stick, a door opens on the bottom and deposits a seed from the hopper. Ka-chink, ka-chink, ka-chink! just like that you have seeds in the ground. A great tool that we highly recommend.

We sowed 5-8 seeds into each clump. The clumps were five-six feet away from each other in all directions, making a giant grid. Each clump had at least two and sometimes all four varieties. They recieved foliar feeding of compost tea at least once. We did not thin the clumps, thinking that, as members of the grass family, they would be fine that way; even happy. This choice also meant not having to select what to leave or take, which could've been tricky since multiple varieties were involved.

By season's end, the tillers coming out from adjacent clumps were making contact at their tassled crowns.

We planted the corn in two different plots at Bailey's, one right next to the upper part of the creek, and one across the field. The patch next to the creek grew approximately twice as productively, apparently due to the higher field moisture. I do also remember that corner of the field having a different mix of “weeds” before we tilled it, too, so perhaps the soil had more nutrition in it as well.

The tallest creek-side corn plants were 9 feet high! These were the Oaxacan Green. The shortest plants – usually the Mandan's Bride – were closer to 5 feet high. The creek-side patch was so vibrant and thick that it was a full-on corn maze by the end of the season. You could feel totally lost in the middle of it, surrounded by the lustrous singing foliage.

We harvested ears when their husks were mostly or nearly entirely browned and dried out. We husked the cobs and laid them out on screens to dry further. Some ears were mixed colors of different varieties. The Oaxacan Green was mostly pure for the simple fact that it was the tallest plant, and corn pollinates by dropping pollen from the tassles on top onto the silks of the cobs below. Some Oaxacan Green cobs were above the tassles of other plants. We did not weigh the corn harvest at any point. Shareholders rec'd 10-14 ears each, with about half the crop held back for seed. We have enough seed to plant corn in plots of ¼ – 1 acre in 2010.

## BUCKWHEAT

We planted a large square of buckwheat nearly a quarter acre in size at Bailey's, plus a 3'-6' wide border of it around much of the rest of the plot. This border was there to signify the planting area, since the brothers from the convalescent home mowed around the edge and we wanted a visual signifier that “something is going on here”, to avoid crops being chopped down (as had happened with the previous winter's cover crop).

The buckwheat was pulled by hand, stacked seed-side-up in shocks, and left in the field to dry. Weeks later, we returned with a tarp and were able to thresh most of the seed from their stalks by banging bundles on the tarps. The stalks were left in the field for organic matter, and to re-seed buckwheat from the seeds still remaining on them.

The threshed but unwinnowed buckwheat crop was stored in two garbage cans in a condo owned by one of Sunroot's supporters, and then finished (but not dehulled) on tarps in February, during the dry spell. We have not found a way to remove the hulls from the seeds. We understand that buckwheat flour can be ground with the hulls intact, and that, alternately, kasha can be made by soaking them off.

Total harvest (lbs.)	105
Seed for farm (lbs.)	0
Total to distro	105
Farmer share	26.25
Helper share	26.25
\$-investor '08 (ea.)	1.79
\$-investor '09 (ea.)	3.47

## MILLET

In some ways, this was the stand-out crop of the 2009 Staple Foods Project. It was super easy to grow. A hand broadcast of seed resulted in a thick stand of plants that kept the weeds out on their own. The apparent harvest per area exceeded all the other crops. Like the buckwheat, we are not sure how to remove the hulls, and have not yet experimented with methods of cooking the seed without doing so

Millet is late spring / summer -sown and is mature within three months. We plan a bigger planting of millet in the 2010 year, especially since the quinoa – another gluten-free grain – proved so sketchy in 2009.

Total harvest (lbs.)	29.5
Seed for farm (lbs.)	10.5
Total to distro	19

Farmer share	0
Helper share	5.7
\$-investor '08 (ea.)	0
\$-investor '09 (ea.)	1.33

## VI. Conclusions

For Sunroot Gardens, **the biggest challenges of farming staple crops were the logistics of harvesting and processing.** We would like to point out that Sunroot owns none of the land used to farm, and paid \$ out for a lease on only one parcel (at the rate of \$100/acre per season, for a grand total of \$200). **This points out the lie in the idea that one can't farm without owning land, which we hear as excuse quite often<sup>7</sup>.**

**After two years of trying, we have seen how woefully inadequate “our best” has been.** Even the most impressive community effort (the 2008 wheat harvest) netted only about 1/3 of the total potential harvest. Until the time comes when Everyone In The Village Drops What They're Doing To Help With Harvest, **hand-methodology will not be effective** for processing grains, pulses, and other staple crops at the scale we need to provide food for ourselves. We have concluded that, **for processing staple crops at the small-scale level (1-10 acres per crop), we will need machines to help us.**

The machines we are looking at could greatly improve the speed and efficiency of harvest. We are investigating machines that reap & bind, thresh & winnow, dehull, and bag. One thresher model can process 1000 lbs. per hour. An Italian-made reaper/binder can cut a field at the rate of one acre in two hours. Compare this with the rates by hand and you will see there is a world of difference.

**We have also discovered that small-scale grain-raising and the machines to do it with are nearly nonexistent in the U.S..** U.S. farm equipment companies basically stopped making machines for this scale in the 1970's, instead focusing on the large farms (as in tens or even hundreds of thousands of acres). There is also not much in the way of old equipment sitting around on farms that we could refurbish. That which remains is mostly rusted out, no longer understood, and forgotten. **Nationwide**

**searches of used small-scale farm equipment for sale have yielded almost no results at all.**

Not that this particular technological road dead-ended everywhere; quite the opposite: in Europe, Asia and India, small-scale machinery has continued to be developed and built. **For what we would like to do here, it appears we will have to order equipment from abroad.** Quite an irony, isn't it? Here we are in what is touted by some as the technological pinnacle of the globe, and we cannot find the tools to feed ourselves.

**After much research, it became clear that we would need at least \$30K to outfit ourselves for the Staple Crops Project for 2010.** This is quite an addition to a budget of \$10K total, and is outside the scope of the \$100-\$400 share price structure we have been using so far to raise funds. In response, an anonymous donor with no expectation of return has made a five-figure amount of cash available to the 2010 farm effort to cover the expenses of purchasing, shipping, refitting, running, and maintaining such farm machinery. These resources have the potential to increase this year's harvest to thousands and thousands of pounds, since we would be able to handle 10-20 acres altogether. If so, then **the shareholders who have been supporting the project so far for so little material return will get to enjoy a jackpot.** These machines could also be made available to other farmers in this and future seasons. In fact, the knowledge of their availability could serve as the impetus for more people to go ahead and plant.

**"The future's here, we are it, we're on our own" - Bob Weir and John Barlow, 1982**

Submitted by Farmer K  
13 April 2010 [rev. 2]

## Notes

- (1) In 2008 and 2009, the bike angle on Sunroot Gardens was written about in several local periodicals: the Willamette Week, the Bee, the Mercury, Oregon Tilth (twice), and the Portland Monthly.
- (2) The farmer later claimed to be switching to USDA National Organic Program (NOP) standards, at least for those parcels close to the residents' house; however, doubts were cast on his following of these standards due to: a) his choice of certifying agency; rather than Oregon Tilth (considered stringent), he went with Washington State (where he “has friends”); b) the spraying of “something” on more than one occasion; c) the different appearance of the farm on the day of the inspection. NOP does not disallow the use of tilth-destroying large machinery, which continued as well.
- (3) As often as possible, Sunroot plots are named for the nearest (preferably on-site) cat, who in the case of “Hampton”, was for a creature who never even visited the plot. Bailey, being the on-site animal, took precedence once his name was known. In the Official Sunroot Gardens Nomenclature Stylebook, an “s” signifies that the creature for whom the plot is named is a dog rather than a cat.



“The Firepit Cat” is a special case, in which the people-name for the oft on-site cat is unknown, so the cat has been named for the garden, “The Firepit”. This morning, she killed two more field mice in the greenhouse storage area when Staple Foods are being stored.

- (4) Originally from one Seeds of Change packet of “Faro”, planted at Old Lemon Balm Garden (up on 39<sup>th</sup> there, just south of Steele. You've seen that plot. Everybody has. As if this writing, a Russian brother named Alexander has been tending it.). The seed was grown out there again in 2006, as well as at the Cora Garden, which produced the seed for Hampton in 2008. 2007 was a skipped year, so from gram-packet to 36 lbs. was just three seasons.
- (5) Double entendre included for investor Elaine Close.
- (6) Leasing and sharecropping are common arrangements in agriculture around the world; to those would-be farmers currently living in the city, I say to you: If you want to farm, then farm. The premium put on “owning” is neither necessary nor even realistic. And in our current late-Imperial context – with accelerating economic collapse and impending food crises – it is much more important for us to learn how to grow food, wherever and however that happens to be, than to continue to live by illusion. We cannot eat our ideas.

## Photos



**Bailey's plot, 2009:** Drill-irrigating the young soup bean plants with compost tea. Blue-handled tool on ground used as a dibble to make hole into a plant's root zone. Bucket of compost tea visible at left. At this point in the year (late July), the surface soil at this unirrigated plot had dessicated completely, making what Steve Solomon (author of "Growing Vegetables West of the Cascades") calls a "dust mulch". A dust mulch prevents field moisture below the surface from being lost to evaporation, since what is called "capillarity" no longer exists in the mulch layer to draw it up to the surface. We also kept the ground as free as possible from weeds since they, too, would be sources of losing field moisture through leaf evaporation. This drill-irrigation was intended to provide vital nutrients to the bean plants and to the soil organisms and microfauna with which the plants cooperate to thrive.



Farmers P and T straining compost tea concentrate into plastic container for dilluting before application.





**Quinoa at Bailey's, October 1, 2009.** Note the variations in color. When the quinoa is ready to harvest, the colored inflorescences turn uniformly tan/brown and are dry and dusty to the touch.



**2008:** Quinoa processing at the Firepit Garden. First photo: cut quinoa heads drying on burlap laid over a ladder that is suspended horizontally over a pit. We were seeking air circulation, and this was the trick (that day, in that place). Second photo: Quinoa threshing station. Cut heads are laid out on a futon frame held up with recycling bins. The broom was for wacking the heads. The seeds fell to the tarp below, now much more free of twiggy parts, and were winnowed with buckets and fans.



**2008:** Quinoa soaking in water to remove the saponins, which are not only bitter-tasting but also an irritant. Ingestion of the saponins can cause pain in the throat and intestinal discomfort. This particular jar of quinoa was soaked overnight and rinsed until the liquid was running clear with no suds. We used the “jet” setting on a hose to rinse the seed, with a screened top to prevent spillage. Two and half gallons of water were necessary to clean it.

Farmer K's impression of the quinoa when eaten: “The best quinoa I have ever tasted, by a long shot. Very 'seedy' flavor, like a good nut. As I ate it, I had pictures come into my head of particular quinoa plants I had known in the field that summer. Felt like one of the most nutritious meals I had ever eaten.”

Quinoa such as you buy in the store has already been cleaned of the saponins, we don't know how. Besides rinsing (and drying if for storage), one could also “rub” the saponins off, maybe with a hulling machine of some sort. In the Andes, where quinoa is from, the rinse water is used for washing clothes because it is so soapy. Farmer K would like to try this laundry method sometime with a pair of ripe farm socks, as that would truly be a test.





**2009:** Farmer K with WTO Corn at Bailey's. Note the height of the corn. (Farmer K is 6'2".)



**2009:** Corn drying on racks at the Firepit Garden. Beans on screens, behind. Note the color variation in the corn. The foreground is mostly "Oaxacan Green", with "Mandan's Bride" winking red in the background.





**2009:** The wheat field at Carver



**2009:** Threshing scythed wheat at Carver with an adapted wood-chipper. Note the piles of wheat behind the figures. The pile continued to the right for another 75 feet.





**2009 at Carver:** Farmer T winnowing threshed wheat. This contraption was made from a gas-powered leaf-blower (sitting on red bin) attached to a series of ducts. Farmer T is pouring threshed wheat into a chute and the chaff is seed is falling down into the bag while the chaff is ejected from the tall chimney.



**2009:** Wheat berries, threshed and winnowed by above methods. Note the high number of seeds that are broken or chipped. (Anyplace you see the color white.) These do not store well and quickly lose their nutrition. This percentage of broken berries is far too high. So few were broken in 2008 that we didn't even notice them.





**2008 Wheat Processing at the Firepit Garden.**

**Above:** Threshing wheat heads (spikelets) on tarps in the driveway.

**Below left:** Removing errant stalks from threshed wheat with a basket over a garbage can.

**Below right:** Winnowing threshed wheat by pouring it bucket-to-bucket in front of a fan. Note tarp on ground under the process in order to catch any mistakes.







### 2008 Wheat harvest

**Above:** Cleaned wheat. Note much lower rate of breakage, as in “none, really”.

**Below left:** Retsel stone grinder for milling the berries into flour.

**Below right:** Rising dough from flour, using sour-dough starter. The sour-dough starter was gotten by mixing some of the flour with water and simply leaving it in an open jar in the Firepit greenhouse for a five days. That's quick for a new starter to be active; freshly harvested wheat can come with yeast bacteria already present. 'Twas delicious.

