Farm Report 2011

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The Managers!

Isaac Arginteanu, Interdisciplinary Studies 2012- I come from Nyack, a small town just north of NYC in the heart of suburbia. I have been volunteering at Dilmun since my freshman year and was hired on as a manager the summer of my Junior year. I originally came to Dilmun because I had a crush on one of the managers, however that never panned out, but I stayed on because of my love of the community and local organic food. Dilmun is a wonderful place and one of the best learning opportunities I have ever had.

Alex Traven, Plant Science ’12- My family runs an organic greenhouse in Bucks County, Pennsylvania, so I have been intimately involved with plants and agriculture since infancy. Still, seeing my labors turn into delicious food and fun for all was a very new experience for me. After working at Dilmun Hill I can safely say that it is the greatest job I’ve ever had, and that I learned as much about actually growing plants in my time at Dilmun Hill as in the entirely of my four years of classes at Cornell.
Tillage and Cover Cropping at Dilmun Hill

Our tillage system at Dilmun was revolutionized (literally!) by the acquisition of our rotary plow implement for our BCS walk-behind tractor. In previous years, tillage was done by Campus Area Farms’ tractors with a moldboard plow. Now, with the rotary plow, we can do our tillage whenever we want. This type of flexibility gives us the ability to be much more precise with our plantings and to be more proactive about improving and protecting our soil.

The Rotary Plow

The Rotary Plow is a rear attachment for the BCS. It is a large rotating screw, angled so that it throws soil to the right. It can dig a furrow up to about a foot deep, and depending on the soil structure and conditions, it will toss soil 1-3 feet to the right of the plow. It also has a carrying wheel that can attach to the back which allows you to adjust the depth.

It is very rugged, and will withstand anything that Tortilla Flats has to throw at it. In rockier soils it would be a problem, but the Rotary Plow has shrugged off any rocks we have come up against. It will also effectively incorporate cover crops and mulches. It struggles against live Sudex (Sorghum-Sudangrass Hybrid) roots, but dead sudex, rye, oats, weeds, etc, it will turn them over no problem. Cover-crops should be mowed/scythed before plowing, but you should not hesitate about the power of the BCS.

A small, but important maintenance point: there are four red, hardened steel plated at the end of the tines of the rotary plow. These teeth are the cutting edge of the plow. Over time their corners will wear down and they must be rotated. You may want to rotate them at some point over the season, and in a number of years, they may need to be replaced.
**Raised Beds**
The Rotary Plow lends itself to our current raised bed system. By making passes up each side of where you want your bed to be you will quickly form a raised bed of overturned soil. There are a number of instructional videos online, and there is an instructional DVD in the library in the back of the barn.

The first pass will make a furrow, on the second pass one of the wheels is placed into the furrow. This angles and the plow and allows it to cut deeper into the soil. A few passes like this and a deep layer of overturned soil will be formed where you want your bed to be.

Raised beds confer a number of advantages: they drain faster, they reduce compaction on the bed surface, they are more ergonomic to work on, they make it easier to lay down plastic mulch, and they provide a means to incorporate compost and other soil amendments.

We built the raised beds this year with the rotary plow. Beds that have subsided can either be renovated by hand with hoes and volunteers, or by running the rotary down the side of them with some of the wheel weights removed. This will bring soil that has subsided into the furrows back onto the tops of the beds. This is also a way to incorporate compost mulches.

The raised beds help fight compaction by concentrating foot traffic to the furrows and by providing a deep space for plant roots to penetrate. In addition, if these beds are maintained permanently, heavy tractors and equipment will no longer have to come onto the field.

**Soil Compaction**
Soil compaction is one of the greatest difficulties we have at Dilmun. Our heavy clay soils are potentially very fertile; however they are very unforgiving when you run heavy machinery over them. Years of moldboard plowing have broken up our soil aggregates and left us with dense compacted soils. We started a number of procedures to help improve the soils, but caring for soils is a lifelong process. It is our hope that what we have started will be continued and improved upon for years to come.

**Cover Cropping**
The Cover Cropping regime we adopted can be split into two parts, our main summer Cover Crop (Sorghum-Sudangrass), and our fall and spring covers (oats and peas, rye and vetch, and rye). Betsy Leonard (Organic Coordinator) was able to get us extra seed from cover cropping trials from years past. Tortilla Flats is not that big and will end up being seeded with cover in small patches at a time, so any small left over bit of seed can be put to use. There are many resources about cover cropping available here at Cornell and through extension. Be sure to read up on the different options and their management strategies.

The Sorghum-Sudangrass should be seeded in early-mid June. It will grow fast and will get too tall to manage if it is not mowed frequently. Once it is up past your knees you can mow it down without hesitation. Mowing also promotes growth of the root system which will make it better at breaking up soil compaction and adding organic matter to the soil. It forms a dense canopy and will suppress the growth of most weeds. This year’s plots were plowed by Campus Area Farms and drill seeded, but next year it should work to just mow and then broadcast the Sorghum-Sudangrass seed. This may give a
lower germination rate, but it is more important to preserve what soil structure there is by refraining from plowing even if you have to reseed some areas or use a heavier seeding rate.

In September we seeded oats and peas where we had taken out other crops, namely Green Beans and Cucurbits. We achieved good results broadcasting the seed and incorporating it shallowly into the soil with a thin layer of compost. Oats and peas will winterkill and provide ground covering mulch in the spring.

Later on (October) we switched to seeding a mixture of Rye/Vetch, or just Rye. Rye and vetch will germinate in the fall, and then over winter. Their living roots will trap nutrients in the soil over the winter and prevent leaching. As well, they will start growing early in the spring and provide weed suppressing cover just as the weather warms up. Rye can be killed by mowing it once the flower head as formed, the same with vetch. You want to prevent the rye and vetch from setting seed, otherwise they will become weeds in the field. In areas with rye that are not on raised beds, the rye can be managed by mowing, and then plowing it under. The rotary plow will easily incorporate residue from oats, peas, rye, or vetch into the soil.

In addition, legume crops such as rye and vetch, especially if inoculated, are effective fixers of N and are a good way to naturally increase our soil fertility.

Below is a map of field for the 2012 season based upon our nine year crop rotation. Highlighted in green are the sections of the field that should be broadcast with sorghum-sudangrass in early June. There is a backpack (more sort of like front pack) broadcaster in the barn that should be effective for this. Broadcasting into our soil may not lead to effective germination, if a week or two after the seed has germinated and certain patches are still bare you should reseed any bare spots.
Sorghum-sudan is our favorite choice for summer cover cropping on tortilla flat, but we recommend that future managers experiment with other types of summer cover. Two interesting options would be buckwheat and marigold. Buckwheat is a vigorous and fast growing cover, however it needs to be frequently mowed unless you want it to go to seed. Its flowers provide a haven for beneficial insects and its dense canopy suppresses weeds. Marigolds are known to confuse pest insects and provide pretty flowers that would sell well at market. Sorghum-sudan may be the best choice for the main summer cover blocks, but feel encouraged to experiment with blank or temporarily empty spaces on the field.

One this to be warned against is brassica family cover crops such mustard or tillage radish. Brassica flea beetles are one of our top insect pests, using crops like these as cover will mess up the crop rotation and exacerbate our flea beetle problem.
Scything
The scythe is an ancient technology, but it is one example where old technology out-performs the new. Mowing with a scythe, besides being an excellent workout, does not require any fossil fuels, and does not require running the BCS or any other heavy mower over the fields. Once you get good at scything, it is faster than the Brush Mower attachment for the BCS, you will never want to use a gas-powered mower ever again! In addition, the scythe is the only way to mow cover crops on the raised beds on tortilla flat. The brush-mower on the BCS is too wide and unwieldy to mow over the raised beds.

We have two scythes at Dilmun, a heavier Stamped steel ditch blade that is perhaps one hundred years old, and a brand new light-weight grass blade we bought from Johnny’s this year. The heavier blade is better for mowing the sorghum or clearing brush and golden rod. The light blade will chew through grass and rye as well as the sorghum. Proper maintenance of the scythe involves constant cleaning and honing of the blade during use, and peening every month or so. A scythe blade should be razor sharp, and can be as dangerous as it can be effective. Although we think that everyone should learn to scythe and that scything is an important tool for small farmers, for safety reasons, volunteers should not use Dilmun Scythes.

Once the weather warms up in the spring, a Scything demonstration and training should be given to new managers. Scything technique is tricky, there are many videos online showing proper technique, but it takes some getting used to, and also some time adjusting the scythe handles to their most ergonomic position. The placement of scythe handles is based upon the measurement of the user. A properly adjusted scythe is necessarily for one to scythe efficiently and without injury. New Managers will have to find what set-up is right for them.
Irrigation and Water Access

Water Sources on the Farm

Cornell Orchards

The most important water source on the farms is our underground irrigation, which is sourced from the Cornell Orchards. It is attached to the orchard line that feeds the Blueberries and the Organic Vineyard. It is municipal water, and consequently potable and good for washing produce. The mainline valve is at the east end of the farm by the fence shared with the Orchards. Call the Orchards to turn on the water when you start to need it, because they will likely not turn on the irrigation themselves until after the farm starts to need it. They may turn it off sporadically throughout the season for maintenance, feel free to call them (they are very nice and willing to help) to turn it back on if they do not remember to do it themselves.

Importantly, this year we set up a sink that can be attached to one of the irrigation lines that goes down the hill to the terraces. This allows you to have potable water down at the barn. There should be a 100’ hose for this purpose in the barn.

Rainwater Handwash Station

On the south side of the barn there is a hand-wash sink hooked up to a cistern that is filled by the Barn’s gutters. This water is fine for washing hands, but is low pressure and not definitely potable. You should get a new jug of Fast Orange Pumice Soap for that sink. It is the best soap for washing the grit out of your hands, especially with the low water pressure.

Well Behind the Barn

There is a well behind the barn next to the pioneer garden. It is powered by an electric pump and you can easily attach a hose to it for watering those raised beds. The water from this well is not potable and is not good for drinking or washing produce. You can turn the pump on by flipping switches 17 & 18 in the breaker box in the side room of the barn basement.

Potable (?) Water Sink

There is a stainless steel potable (?) water sink at the east end of the farm by the Nut-Grove gate and the small red shed. This sink is too far away from most things to be very useful, but remember it is there because otherwise it is quite annoying to get water to the bottom end of the farm.

Irrigation Schematic for Tortilla Flats for 2011 Season

This is a schematic of the irrigation mains for the 2011 season. Our irrigation system is very simple, drip tapes come out of the mains as needed. The 2” main line supplies most of the beds. There are many valves already attached, and more can be added as needed. Drip tapes are easily attached at these valves as needed. Kinks in the line should always be avoided, when deployed and when in storage, however 2” line is good in that it can still deliver adequate pressure while kinked and is less likely to be permanently damaged by such treatment (although it is still vulnerable to lawn movers and accidentally
placed shovels). 1” pipes can be attached to the mainline to reach the two small beds that lie perpendicular to the rest of the field. The advantage of 1” line is that it can be attached with the same simple valves as the drip tape, that means that you do not have to put a T junction in the line. 1” inch lines provide adequate flow. We ran 7 tapes off of a 1” line with no issue.

The Wash Station

There is a large gravel drainage pit at the top of the field. This was installed in 2010 as a wash station. Washing produce there avoids the creation of a mud pit and allows for water to drain through the rest of the field. We attached a garden hose to a normal drip-tape valve with a piece of vinyl tubing and hose clamps. This worked, although there was a little bit of leakage. We used two of the large blue barrels as our “Hydrocoolers” and wash bins. Try to dump these into the center of the drainage pit, and try not to dump them all at once, as the torrent of water will wash gravel out of the pit.
**Troubleshooting Irrigation issues**

I cannot find the irrigation system!

The mainline is stored in one of the large side sections of the basement. Drip-tape and smaller lines are stored up in the loft. The grey cabinet in the tool room is full of miscellaneous irrigation hardware.

**Not Enough Pressure**

If there is not enough pressure there is either a kink in the line or a leak somewhere. There are many old hydrants on the farm still connected to the system. Most of them are safely plugged, but sometimes they may burst. If you suspect this, scout the farm and see if any of these have burst. The main culprit last year was the hydrant by the Old Market Garden. It was fixed, but may still burst.

Also, the water may just not be on. If the water is on our side and there is no pressure, check with the orchards. They may have temporarily turned off the system for repairs.

**Too Much Pressure**

Although we installed an inline regulator at the beginning end of the mainline this year, there may still be too much pressure which can cause drip tapes to burst, or over watering. Be sure to have a number of drip tapes open at once (at least 6-8) to prevent this from happening. If drip tapes do burst, they can be quickly and easily fixed with the yellow coupling pieces we have in large supply in the irrigation cabinet.

**Things do not attach to other things**

Plumbing parts come in different diameters and gauges, with different types of threading, and are made out of different types of materials. These factors can cause parts to not work well together for many reasons, and although parts are not expensive, keeping these things in mind can save you a lot of time and trips to the plumbing store. Also, try to use thread sealing tape on threaded connections. It helps keep the seal water tight and can make pieces easier to disassemble in the future.

Most irrigation pieces are attached using barbed fittings and hose-clamps. If you are getting blow outs, check to see if the fitting is the right size, that the barbs are not worn down, and that the hose clamps are tight enough.

There are two types of pipe threading on the farm: National Pipe Threading (NPT) and Garden Hose Threading (GHT). NPT is the standard for most American pipe fittings, but garden hoses and their fittings are an exception. To fit a garden hose to the main irrigation system you will need a proper adapter, these adapters are cheap and easy to find at most hardware stores including Agway and HEP.

Pipe fittings can be made of a number of materials, including a number of different types of plastics and metals. Take care (or even avoid) mixing metal and plastic parts. Metal threading is hard and sharp, and can easily cross thread a plastic piece when you try to attach them. This can lead to leaks, or at least make it very hard to disassemble.
Although it may be nice to find the exact right part and adapter for every situation, it may just be easier to fit a small length of flexible vinyl tubing over the offending parts and strap the whole thing down with a bunch of hose-clamps. In some cases this may be a better and simpler solution than chaining a bunch of different adapters together.

**Suggestions for improvements**
A PVC union piece between the regulator and the ball valve at the market garden hydrant will make attaching and detaching the mainline much easier.

A pressure gauge for the market garden would be useful. We developed a good qualitative understanding of our system over the season, but a pressure gauge is necessary to properly measure water usage and be more precise with our irrigation.
Pests and Diseases

Pest and disease pressure is not the limiting factor for most plantings this season; however, we did have a couple major disease outbreaks, especially in our ill-fated cucurbit planting.

Insects

**Brassica Flea Beetles** *Phyllotreta cruciferae*

These small leaf feeding beetles were one of our biggest pests. They attack mainly the Brassica family crops, although we have also found them feeding heavily on eggplant. They emerge in the spring and feed heavily on the Brassicas, especially cotyledons and young leaves. They cause at first a shotgun spattering of small holes in the leaf, although after heavy feeding, leaves can die off completely or be completely chewed away.

Later in the season many of the plants grew out of their flea beetle infestation, either through subsidence of the flea beetle population or by the maturation and toughening of the leaves. However flea beetles set our Brassica production back by a week or two in the late spring and early summer.

This year we tried using diatomaceous earth (silica powder made from rock formed from fossilized diatoms) dusting to slow flea beetle activity. This was not very effective. In previous years, *Surround*, a kaolinite clay based spray has proven effective against flea beetles.

Row covers are probably one of the more effective and cost efficient solutions available to us. Our flea beetle issues could have been lessened if we had row covered the Brassicas immediately after transplanting. The physical barrier of the reemay will not completely keep them out, but it will slow them down long enough for the plants to get ahead of them.
Striped Cucumber Beetles *Acalymma vittatum*

Cucumber beetles infested our squash planting this year, and are probably a likely reason for the failure of most of our cucurbits. They especially attach the squash blossoms, leading to poor fruit set, and they are a vector for Bacterial Wilt, a disease which afflicted many of our squash plants.

We did not have any effective control strategies against cucumber beetles. We recommend row covering immediately after transplanting. With our crop rotation, there will likely not be any dormant adults within the new planting. The physical barrier should at least slow down beetle infestation.

*Squash Bug* *Anasa tristis*

These invasive stink-bug like insects were another bad cucurbit pest. They loved to hide under the black plastic mulch and suck at the base of the stems of the cucurbits. It is hard to say how much damage was caused by them and how much was from the cucumber beetles.
Diseases

**Bacterial Wilt of Cucurbits** *Erwinia tracheiphila*

Bacterial wilt is a bacterial pathogen that causes rapid wilting symptoms in cucurbits. It is vectored primarily by the different varieties of cucumber beetle. Control of this disease is primarily based on control of the insect vectors. Summer squash and cucumbers are much more susceptible than winter squash and water melon. Resistant varieties are becoming available, so it may pay to experiment with them in future seasons.

**Powdery Mildew on Cucurbits** *Podosphaera xanthii*

Powdery mildew is transported by airborne spores. It came later in the season than the Bacterial Wilt, and finished off the rest of the remaining squash on Tortilla Flat. It looks like a powdery white dusting on the leaves of the plants.
Recommendations

Our Cucurbit pest and disease issues were likely exacerbated by the density of our planting. We had about 4ft spacing between plants. This provided a denser canopy that inhibited air circulation and promoted leaf wetness, which exacerbates molds and fungi like Powdery Mildew. Some form of trellising may also help by elevating the plants, and especially the fruits off of the wet ground. Plastic or cardboard trays underneath set fruits may help keep them dry and better protect them. We lost many good squash and fruit to molds, worms, and wasps.

Smaller plantings of melons and squash elsewhere on the farm did not suffer as the main planting did on Tortilla Flats. This indicates that it may pay to decrease the density of the planting next season, and perhaps inter cropping with Marigolds and Nasturtiums may help confuse insect pests.

Mammals

Groundhogs (Whistle pigs) *Marmota monax*

Groundhogs, after the managers themselves, are the number one mammal pest on the farm. This year, Campus Area Farms gave us 4 spring action kill traps. Previous use of Have-a-Heart traps has not been very effective, nor in reality, particularly humane. It is illegal to transport groundhogs, or at least without proper licensing, so any captured ground hogs would still have to be killed. With our trapping plan we were able to effectively stop almost all groundhog damage to our crops this season.

The kill traps proved to be a more effective, and in practice more humane, means of wildlife control. We scouted burrows often for activity, especially burrows near Tortilla Flats and the BMP beds. Traps were checked, reset, and moved as needed at the beginning and end of every day. There were a few serious ground hog attacks in the beginning of the season, but once we began effective scouting burrows, we saw no more groundhog damage to the crops on Tortilla Flat. A total of 28 groundhogs were exterminated over the summer, and the capture rate did not decrease by much over the season, even with consistent trapping; this either points to an endemic groundhog population of immense proportions or rapid immigration of groundhogs onto the farm once territory opens up.
The traps that we have are potentially dangerous. Be sure to be properly instructed in their use, and to wear gloves and to use the setting tool when you are using them. It is also good precautions to disarm them when there are visiting groups or dogs on the farm.

Emily Wine *Homo sapiens*

Emily was the student researcher for the 2011 season. She is a ravenous pest of brassica crops. Recommended control measures include row covering and intercropping with cilantro.

Deer *Odocoileus virginianus*

Deer are potentially devastating, but as long as you keep the gates shut, they will not get into the deer fence. We were able to go without a deer incident all summer. We had some deer incidents in late October. By this point some deer damage did not matter so much, but they got in because the gates had been left open by a third party. We do not lock our fences as the farm is meant to be an open place, and we want to encourage volunteers and visitors to come to the farm whenever they want; however it is important to make sure there are signs and people are educated about keeping the gates shut behind them.
Growing Spaces and Crop Rotation

In 2008 a 9 year crop rotation was formulated at Dilmun, however, 2011 was the second year where it was implemented in its current form on Tortilla Flat. The above diagram shows the layout of the beds for the 2012 season. Some small modifications may need to be made, perhaps separating summer and winter squash, however it is important to stick to this crop rotation. Rotation is an important part of our pest/disease management strategy and soil management.

Two books that we recommend are “Sustainable Vegetable Production from Startup to Market” NRAES 104) by Vernon P. Grubinger and “Crop Rotation on Organic Farms: A Planning Manual” (NRAES 177) written by a number of authors including many Cornell researchers. These books can be found at Mann Library, in the library at the farm, and online as free pdfs. As well, you can purchase them for yourselves at a reduced price directly from NRAES if you mention your Cornell affiliation.
Growing Spaces

Below is an aerial photo of the farm from 2007. More recent imagery is not available, so many current projects are not visible, and projects that have since ended are visible. However the general layout of the blocks is still the same. The main addition over the past two years is that the area behind barn has become “The Pioneer Garden”. Three raised beds were built back there in 2010, and with the help of Frank Rossi’s introduction to horticulture class, we built two more this fall.

The Pioneer Garden

The center three beds of The Pioneer Garden were built in 2010, and the outer two were built in the fall of 2011. These beds are composed mainly of CU compost and have sides made out of Black Locust planks. The outer two are also bottomed with cardboard to decrease weed pressure. These beds can go into production much earlier than Tortilla Flats. Especially if you row cover them, they will warm up early in the season and are a good place to grow crops like radishes, spinach, arugula, and lettuce. Later in the season, they are good for growing root crops like carrots and parsnips that do not do as well in the heavier soil up on Tortilla Flat. Deer and groundhog predation is the primary issue in the Pioneer Garden. We found that a combination of row-covers and black plastic mesh did a good, but not perfect,
job keeping the rodents and ungulates out. In the future, a 10ft deer fence around this area would allow us to better take advantage of this space.

**Tortilla Flat**

Tortilla Flat is the main growing area of the farm. It is about an acre in size, although in the rotation, about 1/3 of it will be in cover crop during the season. It has very heavy, clay soil. In 2011 Tortilla Flat did not dry out until mid-late may. We tried to till before then, but these beds, mainly in the Brassica Section, were not of the highest quality. Tilling when the soil is too wet, especially in clay soils like ours, leads to more compaction and the formation of large clods.

The soil on Tortilla flat is too dense to direct seed most vegetables. Field crops like sunflowers, corn, and broadcasted seeds will germinate, but for vegetables where you need more precise germination, it is best to do them by transplant.
Markets and Sales
Set up for markets can be hectic, but once you get the system down it becomes much easier. On the Ag Quad you can get tables from the circulation desk at Mann Library, although you have to reserve them ahead of time (can be done through the Mann Library Website, you can also reserve conference rooms for meetings and events this way) during the semester. On Ho Plaza, Farm2Cornell can provide you with a table and chairs with the Campus Farmers Market.

The bike carts are invaluable for bringing produce to market on campus. You do not have to worry about parking or any of the other numerous regulations about cars on campus. In addition bicycling is a big part of Dilmun culture and our mission of sustainability. Most important of all, you get to look really cool when you are hauling a load of veggies through campus on a bike cart. The carts can hold up to 100lbs, but up to 60 is more reasonable. Loading the carts safely and in a balanced fashion can have more of an effect on the performance than the absolute weight of the cargo. Make sure your tires are filled and your breaks are working. A loaded bike cart, a down-hill, and failing breaks are a bad combination.

Summer Markets
This season we had summer market stands every Wednesday on the Ag Quad from 1-5. We found that extending the time allowed for us to take in customers during the lunch rush and when people left work at the end of the day.
**Fall Markets**
We had fall market stands Mondays on the Ag Quad from 3-5:30 and from 11-3pm on Ho-Plaza with The Campus Farmers Market sponsored by Farm2Cornell. By October, we did not have enough produce to handle two sales a week, so we only had the Ho Plaza sales with the farmers market because we had already committed to Farm2Cornell and Manndible. The Ag Quad sales are easier to set up and the crowd on the Ag Quad definitely knows their veggies. If we could, we would have had more sales on the Ag Quad in the early fall. Despite this, with the support of the Campus Farmers Market, Ho Plaza sales proved more profitable than they had been in the past.

**Manndible Café**
Manndible is our best customer. Kathleen Passetty (owner) is a great resource and very understanding and flexible with managers as they are learning to figure out farming, harvesting, and distribution at the same time. We generally provided them with a list of available produce on Thursdays, and would deliver Monday morning. We share the Pomology Cooler in Plant Sciences with them, so often we can just leave produce directly in the cooler for them. After deliver we send them invoices copied to Betsy and our contact at the CALS Business Service Center. Manndible bought mainly the bulk of

**Cornell Outdoor Education**
A new and awesome customer this year was Cornell Outdoor Education (COE). COE is very supportive and requested a couple big orders of vegetables for their Summer Odyssey program for incoming freshmen. We hope to have more direct collaboration between Dilmun and COE in the future.
Sales Data

Total Revenue: $3151.00

Certain vegetables provided the bulk of our revenue. Kale sold consistently in smaller amounts over the entire season. Tomatoes and peppers sold well at markets, but about half of their value was as sales to Cornell Outdoor Education and Manndible.

Volunteers and Work-Parties

We had a great set of volunteers this season. We had a solid crew of around ten who came consistently over the summer, and even more during the school year. It can be hard to manage so many people, but everyone is always willing to learn, and having so many hands makes even the most tedious and difficult tasks on the farm short work.

We set up our work-parties over the summer on Tuesdays and Thursdays, 4-7pm. This allowed us to work in the cooler evenings after people who wanted to volunteer had gotten off work. In the fall we had work-parties Wednesdays 4:30-7pm and Sundays 11-2pm. Having a work party before a sale is important. A few extra hands will make harvesting go very fast. Our consistent volunteers quickly picked up how to do all the farm tasks, some even came up with good suggestions and improvements. Time
taught teaching and listening to volunteers is more valuable than time spent working. By then end of the season we had a few volunteers that could have probably run work-parties themselves.

We sent 1-2 reminder emails a week over the listserv about sales and work parties. It has always been a managers’ prerogative to come up with a unique and entertaining email style. Over the years it has ranged from whimsical poetry to hidden links to interesting Wikipedia articles.

We gladly gave away plenty of hard earned veggies to our volunteers. Although many volunteers lived off campus and had their own kitchens to cook veggies themselves, it would be a good idea to expand upon the Dilmun tradition of potlucks. Many freshman volunteers do not have access to good kitchens, and consequently only have a limited ability to prepare and eat vegetables from the farm. Pot-lucks are a great way to build community and to share the bounty of the farm.

For recruitment, we tabled at the Green Fair and ClubFest in the beginning of the semester. Although these events do not feel very productive, and you sign up a lot of people who never make it out to our farm, some of our top volunteers were first contacted at these events. We also went to the Plant Science Department orientation meeting for freshmen and new transfers. These meetings are a good way to make sure new people to campus hear about the farm right away and get in the know.

Collaboration and Outreach

Classes at Dilmun

- SNES 1101 Intro to Environmental Science
- HORT 1101 Horticultural Science and Systems
- CSS 2600 Soil Science
- HORT 2200 Sustainable Landcare
- HORT 4260 Practicum in Forest Farming
- HORT 2400 Exploring the Small Farm Dream

Outreach

The farm hosted a number of visiting youth groups over the including a number of highschool/middleschool aged 4H groups and the Youth Grow Summit. We hosted 4H students from around the state who came to visit campus, including the Green Jobs and Exploring the Small Farm Dream groups. The students had a great time at the farm and were very enthusiastic. These were some of the most hectic but also most rewarding days on the farm.
Crops in Review
(Special Thanks to Fiona Modrak for some great veggie photos!)

Brassicaceae
Brassicas are really important staple crops that folks expect to see at the farm stand, and while they may seem pretty unexciting when compared to things like tomatoes or squash, they consistently sell pretty well. As far as growing them is concerned, brassicas require a bit more care and time than would be expected. They are fairly heavy feeders, and should be planted with a good amount of compost. The larger, longer season crops like kale should be fertilized with fish emulsion about every two weeks to maintain productivity. For all the brassicas flea beetles are a serious concern, especially early in the spring and when they are young. We recommend row covers for all transplants.

Kale: Winterbor, Tuscano, Redbor, Red Russian- Without a doubt, Kale is one of the flagship crops of Dilmun Hill. With regular sales to Manndible and of big beautiful mixed variety bunches at the farmstand from June until the end of October, Kale may well have been one of the most profitable crops we grew as well. This year we planted three rows of four varieties- one entire row of the staple green curly leaved variety Winterbor, and two rows split between Tuscano (also known as Dinosaur), Redbor, and Red Russian. Early in the season flea beetle damage was a big issue, but Manndible was luckily still willing to purchase some of the moderately damaged leaves because they would chop it finely and cook it for burritos anyway. As far as varieties go, Winterbor was pretty consistently the best. It’s curly leaves hide superficial damage very well, and it was very productive. Tuscano kale is really delicious but it shows flea beetle damage a bit too much, so we couldn’t really sell it until later in the summer. For the fall farm-stands though, the Tuscano looked fabulous and was a great addition at sales. The Redbor was donated from Alex’s parents’ greenhouse, Peace Tree Farm. The variety was a lot like the Winterbor, but its deep red color added some nice contrast to the kale bunches. Red Russian is the only variety we would not recommend growing again. It had a strange, less vigorous growth habit than the others, and showed flea beetle damage, and was generally not as desirable as the other varieties. Some general recommendations for all the kale varieties are: start early, protect from flea beetles, remove lower leaves when they get ratty or shaded, and be sure to apply fish emulsion regularly to maintain fertility.

Broccoli: Arcadia- The wide beds that we planted most of the brassicas in were the first one we plowed in the spring. The soil was still a little wet, and our technique with the rotary plow a little bit shaky, so
the beds turned out somewhat suboptimal and got pretty compacted. This combined with the hot and dry weather in June and July meant the broccoli did not turn out well. We did two plantings, but most of both bolted early. They also had this issue at Freeville and other local farms. We did get to harvest some small heads later in the summer (way later than they should have been), and they did sell fairly well at the farm-stand. It is tough to judge the quality of this particular variety based on this year. For next year we would recommend planting less broccoli, and definitely only do one early planting. More cauliflower or kale would probably be a better choice.

**Cauliflower:** Skywalker- The cauliflower got off to a slow start and faced the same challenges as the broccoli, but turned out much nicer overall. They took much longer to grow than we expected, and flowering was pretty irregular. We wound up harvesting a few heads each week from mid-summer all the way into October. They always sell very well at farmstands, and fetch a much higher price than broccoli. The variety we used this year, Skywalker, is self-blanching, meaning that the leaves are very upright and keep the cauliflower shaded to maintain nice white color. Based on its success despite a really rough growing season, we think this is probably a good variety to stick with.

**Radishes:** Cherriette, D’Avignon, Easter Egg Mix, Red Meat- We got it into our heads in the early spring that radishes were going to be the next big thing for Dilmun. We ordered three spring varieties, as well as a summer Watermelon radish. The smaller spring radishes are really fast growing (ready to harvest in less than a month), and seem to be pretty foolproof. We direct seeded lots of the D’Avignon French breakfast variety and the round Cherriette in the Pioneer Garden raised beds in early April, and were harvesting by the end of the month. We also broadcast planted a pretty sizeable bed on Tortilla Flats with the multi-color Easter Egg Mix and more of the D’Avignon and bit later, as were soon absolutely inundated with radishes. While the colorful bunches did sell pretty well at our first farmstands, our radish hype proved to be a bit overblown, no matter how ridiculous of claims we made about their health benefits. We planted the watermelon radishes in the pioneer garden in midsummer, but they simply did not perform that well. Most of the ones we harvested were quite small (a bit bigger than a golf ball- a far cry from the baseball sized roots we were expecting), and many had split roots and deep cracks and were rotten inside. We have more than enough seeds of all the spring radishes leftover from our initial purchase, and would certainly recommend planting a good amount of them again, but perhaps a bit more conservatively than we did. Watermelon radishes are pretty popular, so they are probably worth another try next year, and hopefully with milder weather they will perform better for future managers.
**Daikon:** Summer Cross- Daikons have the potential to be a really valuable crop for Dilmun. They are in high demand at farmstands, and Manndible will take as much as we can possibly grow. We planted daikons in the Pioneer Garden in early summer. They grew well, but had some issues. Many of them outwardly appeared very nice, but many had the telltale insect holes that indicated much of the inside was hollowed out and full of bug poop and sometimes the bugs themselves. Additionally, these holes often provided entry for fungi and bacteria, so many otherwise beautiful roots were filled with foul smelling sludge. We did manage to sell some daikons to mandible, but overall the crop was a bit of a disappointment. Daikons may be a difficult crop to grow organically, but they are certainly worth a try and are a valuable experience for managers.

**Kohlrabi:** Kolibri- Kohlrabi was a new crop for Dilmun this year, and we’re very happy with how it turned out. It was one of the first things to go in the field, so it was transplanted into wet, hand turned soil without any compost added. Despite being planted into what essentially turned into concrete and being assailed by hordes of flea beetles and slugs, our first crop turned out just fine and sold well at our first couple farm stands. The fall crop was planted with much better soil tilth and compost, and grew much faster. We highly recommend Kohlrabi as a good early crop for next year. With a better prepared bed it should turn out fantastic. The variety we grew was a small, fast-growing purple type that was attractive, crunchy, and tasty, and added some much needed color to our otherwise very green early farmstands. Next year we recommend trying to grow a larger storage variety called Cossack that we have seen do well at other farms in the area.

**Brussels Sprouts:** Diablor- Our Brussels Sprouts crop got started a little bit late. We made the calculation for when to start them based on a mid-November harvest, but failed to realize they don’t really grow much come October. We would recommend planting in June, as opposed to July for next year. Be sure to cut the tops of the plants off around late September to force all the plants’ energy into the side buds! A good crop of Brussels Sprouts would be a great way to have a late fall farmstand.

**Broccoli Raab:** Sessantina Grossa- Our first crop of broccoli raab was a total loss. We tried direct seeding into hand turned soil in the early spring, and sure enough the soil got so crusty that almost none could germinate. What few sprouts did emerge were devoured by flea beetles. We had much better success with our fall crop, which we seeded in the greenhouse in August and transplanted in early September. We got a good harvest of nice stems with flower buds, and had no trouble with flea beetles this time. Most of the harvest came in after we were done with sales. Broccoli-raab is a cool niche crop that can be of high value, but the general consensus we have gotten from volunteers and customers alike is “Cool! So what do you do with it?” so if you choose to plant any in the future, make it a limited planting. Also, be sure to plant with tight spacing so the stalks are thin and tender.

**Pac Choi:** Black Summer- We planted a couple flats of Pac-Choi in the greenhouse in August and they were transplanted into a new raised bed in the pioneer garden in early September. It proved to be a fairly successful fall crop, and sold very well at our last farm stand. For next year, plant it a week or two earlier, and do your best to keep it row covered to keep flea beetles off. We got some considerable damage from slugs as well, so also consider using diatomaceous earth or some other physical protectant while the plants are young. It could be a potentially valuable spring crop as well.
**Greens Mix:** Ovations- Despite our best row-covering efforts, the ovations mix was entirely unsellable due to flea beetle damage. It germinated quickly and grew to full size, but it looked like it had been used for shotgun target practice. In general early season brassicas face huge pressure from flea beetles, so it may be better to stick with lettuce mixes and spinach for early season greens.

**Arugula:** Discovery, Astro- Arugula has some serious selling potential. This year it was a little tedious to harvest by hand, but with the greens harvester we have for next year, it could be hugely profitable. We grew two varieties this year: Discovery, a rustic wild-type, and Astro, a larger leafed more conventional variety. Both varieties were directed seeded in raised beds in the pioneer garden in the spring, and we did a fall crop of Discovery as well. Discovery proved to be an emotional roller-coaster, but in retrospect we are really happy with this variety and would highly recommend it or a similar rustic variety. At first we were a bit disappointed because it grew slowly, and then got some serious flea beetle damage, but as soon as we discovered what an amazingly refreshing nutty and spicy taste it had we were totally sold. At farm-stands we would offer free samples of both varieties, and were sure to point out to customers that the Discovery had some insect damage but was still fine. When they tasted it, customers almost invariably decided they wanted the Discovery, flea beetle damage be damned. Even though it took a while to get started, we were able to get several cuttings off of the spring crop before it bolted. The Astro was much faster growing and far more robust, and seemed to be much more resistant to flea beetles too. Though it was much easier to grow, it had a bit of a strange soapy taste that left a lot to be desired compared to the Discovery, and bolted after fewer cuttings. We would recommend growing both varieties (or at least both general types) again next year. As with all young brassicas, row covers are a must!

**Cucurbitaceae**

Just like last year, Cucurbits were a source of great sadness. From the start we were optimistic that we would learn from last year’s mistakes and do better this year. We did all of the seeding in the greenhouse in larger 36 cell trays to give the young plants more room about 3 weeks before we intended to plant them. It is really important to not let cucurbit seedlings get too big before transplanting! We had lofty goals with them, and transplanted them on heavily composted raised beds with black plastic. The black plastic saved a ton of weeding labor, but it
seemed to create a nice habitat for insects and rodents, and later in the season we found that holes had been chewed right through the plastic into the undersides of fruits. We were sure to leave a significant amount of space between plants (about 4 feet in each direction) based on advice from last year, and hoped this would prevent some of the disease issues from last year. Soon after planting, every single cucurbit was absolutely swarmed with yellow striped cucumber beetles and big black squash bugs. It wasn’t long until we saw the first couple summer squash collapse with symptoms of bacterial wilt, a 100% fatal disease vectored by the cucumber beetles, and we could only watch helplessly as new plants collapsed daily. Luckily, it seemed the watermelons, pumpkins, and butternut squash were resistant to the disease. Sadly, this only meant they survived long enough to be killed off by the epidemic of powdery mildew that was fairly ubiquitous across the entire state this year. From all the squash we planted, we only harvested a few dozen summer squash, a couple cucumbers, a couple dozen early pumpkins, a few underripe winter squash, and couple sad little watermelons.

**Cucumbers:** Corinto, Marketmore- Cucumbers were a pretty sad story at Dilmun this year. We planted 18 Corinto seeds in 36 count trays along with the rest of the cucurbits. They germinated quickly, but stretched a bit in the cold frames before we had a chance to plant them. The day we planted them was really windy, and a lot of the stems cracked, so many of the plants got off to a slow start. Some of these were replaced with Marketmore transplants donated by Michael Glas about 2 weeks later. Like the rest of the cucurbits, the cucumbers were all heavily plagued by cucumber beetles, and eventually succumbed to powdery mildew. We only ever harvest a few cucumbers, and all of these were eaten by volunteers and managers.

**Summer Squash:** Sunburst, Slick Pick, Bush Baby Zucchini- In past years it seems managers have grossly underestimated the productive power of summer squash and wound up with more summer squash than they can deal with. With this, and the fact that there is ALWAYS too much summer squash in mind, we cut back on planting summer squash in favor of more winter squash, melons, and pumpkins. Overall it worked out to about ¼ row of each of the three varieties that we grew. Slick pick was a crook-necked typical summer squash, Bush baby was a fairly typical zucchini that was supposed to stay smaller, and sunburst was a bright yellow patty-pan variety. Of these three, the sunburst was the most productive, best-selling, best tasting, most disease resistant, and the most interesting. For next year you could probably do without the Slick Pick variety. For a couple weeks we had about as much summer squash as we could sell at farm stands, but as mentioned above, the first signs of coming doom for our cucurbits were the summer squash coming down with bacterial wilt. The onset of this disease is really dramatic. One day the plants are full and bushy, and literally overnight it becomes a flaccid pile of leaves.
**Winter Squash:** Metro Butternut, Cornell Bush Delicata, Honey Bear Acorn, Sweet Dumpling, Green Hubbard- We went heavy on winter squash this year with the idea that they were more popular, and that we could sell them over a longer period. Needless to say, there is greater risk involved with growing winter squash because the plants have to be in the field so much longer than summer squash. As soon as plants started setting fruit, we carefully placed pieces of cardboard under them to protect the fruits. Because of the insect and disease pressure this year, we were only able to harvest a few small butternuts and some under-ripe acorn squash before the plants were totally destroyed by disease. As far as varieties go, we would certainly recommend the Bush Delicata, if just because it is a Cornell variety, and the acorn squash. If possible, try to plant Honeynut instead of Butternut for next year. It is a newer variety with much better flavor and is in high demand at farmer’s markets. The sweet dumpling and couple Hubbard plants we grew were somewhat of an afterthought with the intent of demonstrating a bit of squash diversity, and we only really planted them because there were some seeds left over from last year.

**Watermelon:** Little Baby Flower- From the day they were seeded with the other cucurbits, the watermelons were simply not as vigorous. At planting they were probably half the size of the others, and they generally remained much more spindly than all the other cucurbits. Like the other cucurbits they were assailed by cucumber beetles and squash bugs. Soon after the vines started to run and flowers started to bloom, we noticed the leaves curling, which is a common symptom of a heavy thrips infestation. Sure enough, the flowers were covered with thrips, which is usually only a major issue in greenhouses. This caused a lot of fruit set to abort, and generally restricted growth. We did get some small fruit set, but as soon as powdery mildew set in a lot of them started to rot before fully ripening. Others got damaged by rodents or birds, and as soon as a hole was opened they would be filled with wasps. We only got a few good fruits off of the entire row that we grew.

**Pumpkin:** Baby Pam- The pumpkins turned out a little bit better than some of the other cucurbits. The plants were extremely vigorous and the vines seemed to just pour out of the ground. They didn’t get the bacterial wilt, and lasted a bit longer with the powdery mildew than some of the others. Strangely, all the fruit that had set started to ripen in mid-August, rather than late September like we were expecting. We think this was probably a last ditch reproductive effort by the dying plants. We stored the couple dozen fruits that were harvestable in the barn until people were ready to start thinking about buying pumpkins. Some got eaten by mice in the barn, but every single one we brought to farm-stand sold quickly, and for pretty good prices. This particular variety, while very pretty and good as an ornamental, also proved to be a delicious pie or baking pumpkin as well. If conditions were a bit more favorable, pumpkins could have been a really good crop for Dilmun.

**Amaranthaceae**
Note that the Amaranth family and the bean family (Fabaceae) are treated as one unit in Dilmun Hill’s crop rotation.
**Beets:** Bull’s Blood, Touchstone Gold, Chioggia Guardsmark- We knew from past years managers that there is huge demand for beets, both at farm-stands and from Mandible. Keeping this in mind, we worked a full seven separate plantings of beets into our crop schedule for this year and had big plans. The first planting was direct seeded into a raised bed in the pioneer garden, and the second direct seeded into hand turned soil on Tortilla flats. Those that we planted in the pioneer garden performed alright, but they were slower than we expected, and the roots never quite reached the size we hoped for. Additionally, the foliage of this crop got fairly well mowed by a groundhog at some point, prompting the start of our aggressive anti-groundhog campaign. Those that we direct seeded on Tortilla flats didn’t stand a fighting chance in the cemented clay. Based on this, we decided it would be best to try transplants for the remainder of the plantings. One of the most important thing to understand about planting beets is that the “seeds” are not actually seeds at all, they are actually small dried fruits that contain anywhere from 1 to 4 seeds. This meant that every time we transplanted we had to pull the plantlets apart to plant them individually. We tried to transplant while the plantlets were young enough to not be root-bound, but this still proved to be a problem. Many of the beets we did grow had a distinctly squared shape to them, and a flattened bottom indicating the tap-root had been damaged. We definitely do not suggest direct seeding beets at Dilmun, so for next year be sure to transplant much younger and pull the plantlets apart. Also make sure you have water on freshly transplanted beets. Bull’s Blood is a standard red beet and we recommend it again for next year. The golden beets and candy-striped Chioggia variety are certainly in high demand, but the plants grow very slowly compared to the red beets.

**Swiss Chard:** Bright Lights- Swiss Chard is actually the same species as beets (Beta vulgaris), and therefore like the beets its “seeds” are actually multi-germ fruits. In the greenhouse several plants will emerge from each plug, and these should be thinned to a single robust plant as early as possible without damaging the remaining one. We were able to harvest lots of tender baby chard early in the season and this sold really well. Unfortunately, the Chard was planted in beds on the downhill slope leading towards Route 366, so the soil proved to be far more waterlogged than further uphill. Additionally, this edge of the field had some intense weed pressure as well, so a lot of time was spent clearing persistent curly dock and quackgrass from the Chard. As the chard got bigger, we noticed some necrotic, purple-haloed spots appearing on both the Chard and the invading curly dock (which is in the same family). This disease (probably something bacterial) stunted the plants and forced us to remove a lot of leaves. What Chard we had almost always sold well, but take note that at harvest and at farm-stands, Chard bundles will wilt extremely fast (as short as 10-15 minutes) in the sun or wind and have to be kept moist and shaded. For next year we definitely remind planting lots of Rainbow Chard like this year, but ensure that the soil is well drained and keep weeds (especially weeds in the Amaranth family) out. Also spray Chard regularly with fish emulsion to maintain fertility with constant harvesting.

**Spinach:** Emu, Regiment, Python, Corvair- This year’s spring spinach crops, direct seeded in the pioneer garden in April, were a smashing success. For weeks we harvested tender round and arrow-head shaped leaves, some getting bigger than a hand. Both the Emu and Regiment varieties we planted in the spring performed very well. We planted a fall crop of two different varieties, Python and Corvair, in early September, but got almost no germination despite favorable temperatures and rainfall, and we aren’t
Sure why. Apparently Freeville had the same issue with their fall Spinach crop, so at least we know it wasn’t some failure on our part. Spring Spinach is an awesome crop! Plant lots of it and you’ll be stronger than Popeye in no time!

Fabaceae

Bush Beans: Provider, Carson- Last year the direct seeded beans had really poor germination and what seedlings did make it out were either eaten or really struggled with our heavy clay soil. This year we decided to transplant the beans instead of direct seeding, which is actually an unconventional thing to do. The seeds were inoculated with nodule-forming bacteria and planted in the greenhouse about two weeks (a much shorter time than most crops) before we were going to plant them. Even in this short time the seedlings stretched a bit. We transplanted the in the field with lots of compost, and they took off gloriously. By late June we were harvesting lots and lots of beautiful sweet beans, and the plants were so productive that it was hard to keep up with their output and many beans quickly got too large and woody for sales. Productivity was high until August, when the weather started to turn a bit wetter and anthracnose infection set in. After this the plants were still productive, but much of the produce was unsellable. Both varieties were great, and mixed quarts of the green Provider and Carson yellow wax beans sold very well. For next year we vouch fully for both of these varieties, and think having the color variety is very attractive. We also think that transplanting beans may be the way to go for Dilmun’s heavy soil, but stress that there should be no more than 3 weeks between seeding and transplanting or they will get too stretched and root-bound. Note also that harvesting beans can be a really tedious time-consuming task, and that it is easy to damage the plants if you try to move too quickly. Additionally, it is
very bad for beans to harvest when the plants are wet, as this can lead to spreading disease and fungal infection. We think it would be interesting to experiment with some climbing beans on trellises next year to better use space.

**Dry Beans:** Tongue of Fire, Indian Woman Yellow- Like the bush beans, we decided it would be best to transplant the dry shelling beans as well, and we had similar success with this. Tongue of fire seems fairly productive and is at the very least interesting to look at. The Indian Woman Yellow was a variety that we had leftover seed from last year, so we only planted a few. They proved to be not as productive and obviously had more of a climbing tendency. None went for sale, however they were put to good use when served at potlucks and the field day.

**Peas:** Sugar Sprint, Snow Sweet- Peas were among the first crops to go in the ground, so they did not get treated as well as many of the other crops and didn’t work out very well. Like the beans, we decided it would be better to transplant the peas to avoid the poor germination and other issues they had last year. Right off the bat we realized we only had one application of the legume inoculant, and thought it would be better used on the beans, so the peas were never inoculated. Next, they were planted in wet, hand turned, heavily compacted soil in the early spring. The plants didn’t have much time to get a good foothold before we plowed the adjacent beds with the rotary plow, and accidently sprayed some dirt clods on the peas’ row cover and crushed some. The ones that survived this onslaught should have been trellised somehow, but they were not so they quickly got submerged in weeds and otherwise were just not very lively. We did manage to harvest a couple quarts for sale, but the crop was otherwise a loss. We tried direct seeding a fall planting in some finer tilth soil late in the summer, but this didn’t work out and we put the bed into cover crop. Peas are certainly popular and desirable, and with some care and planning peas could turn out alright, and are definitely worth a try next year.

**Alliaceae**

Nobody is quite sure how or why, but Dilmun Hill has a supernatural ability to grow world class alliums. This year the alliums were planted directly into compost filled furrows in untilled sorghum residue. We think it may be possible to do strip-tillage onions like this again next year. In general you can’t really have too long of a season for most of the alliums, and it is really important to plant them in the greenhouse as early as possible in the spring (By March 1st if possible). Make sure to plant deep enough that the bulbs are entirely underground, and keep tops mounded as necessary. Pest pressure was not an issue this year, and has not been historically either. Alliums are not, however, competitive with weeds, so be sure to keep weeds clear and apply straw liberally.

**Onions:** Redwing, Copra- Both varieties of onions that we grew turned out very well. Redwing was a beautiful red variety that got quite large, and Copra was a smaller yellow storage onion, but most still got larger than most onions they sell in stores. For next year we’d recommend planting rows a bit closer together (maybe a foot apart) to maximize valuable allium space in the field. Also make sure to plant deep enough and cover enough such that the tops of the bulbs are fully covered. This prevents the tops from being papery. We also planted a good number of onions in the pioneer garden under the pretense
that deer and groundhogs would not eat pungent alliums. While they didn’t “eat” them per se, they certainly enjoyed gnawing the tops off again and again and pulling them out of the ground. This crop was a total loss as a result.

**Shallots**: Ambition- Growing shallots is essentially the same as growing onions, but they tend to be a bit smaller and easier to lose in aggressive weeds. Dilmun’s shallots are exceptionally large and exceptionally awesome, so there is huge demand for them. Consider planting more next year.

**Leeks**: Tadorna- This year we did two plantings of Leeks to try to spread the harvest out a bit more. The seeds of the first didn’t germinate as well as we would have liked because they were placed above an air vent in the greenhouse and dried out a bit too much. The second fared much better. The first crop was gradually sold at farm stands from late August onward, but the second was put in the ground a bit too late and has mostly gone to late season volunteers and managers. Doing two crops is definitely worthwhile, but ideally they would both be seeded about a month earlier.

**Scallions**: White Spear- We planted scallions on five separate occasions and harvested almost every week from June through October. For seeding we would put about 5 seeds in each cell of 72 trays, but for one of the plantings did about 3 or 4 seeds per cell in 128 trays. Both ways worked out just fine. The plants do not need to be separated when transplanting. Every crop turned out beautifully. They were consistently a good seller, so we would recommend growing lots over many plantings again next year.

**Garlic**: German White, French Red Softneck- The hard-neck German White garlic planted by Ryan, Dan, Becky, Adam and the volunteers last fall turned out fantastic! We cleared away some of the heavy straw in the early spring to let the sprouts emerge more easily, and were harvesting tons of plump scapes by Mid-to-late-June. After the plants had senesced down to the central stalk, we harvested the bulbs themselves before a rainstorm in July. If there was a garlic beauty contest, these massive purple streaked bulbs would be a formidable contestant. We sold lots at the farm-stand, and a good amount to Mandomible as well. In the fall we planted all of our remaining German White, and also ordered a French Red Softneck variety from Ed Frazier near Rochester, so there should be more garlic in general and more variety for next year!

**Solanaceae**

Solanum crops are probably the most desirable and interesting of all the plant families. When people think of a vegetable farm, they immediately think of tomatoes. As awesome as they are, they sadly only get the same amount of field space in the crop rotation as the other families, and it is a real challenge to fit as much as you’d like to into that space. Hopefully for next year there will be extra space available in the BMP beds!

**Tomatoes**: In addition to some old staple varieties, this year saw Dilmun trialing a great variety of interesting varieties. This was made possible by a donation of plants from Alex’s parents at Peace Tree Farm, and we are extremely grateful for this. Check below for specific reviews of all the varieties we planted this year. Having a bunch of different tomato varieties was a great tool for the farm, and at the
Fall Field Day in September we were able to do a really fun tomato tasting activity that was very well received. Tomatoes can be safely planted in Ithaca by the very end of May. We could have gotten them in earlier this year, but the threat of a late frost is too great to plan on having them in before the last couple days of May. The tomatoes that were planted in the main section of the field were grown on heavily composted raised beds with black plastic mulch. We also planted some tomatoes on empty areas of the swales, and lots of compost was added here as well. Tomatoes should be planted very deeply, as they send adventitious roots out of the stem. Diseases are a serious concern for tomatoes, so always be on the lookout for leaf spots, necrotic tissue, wilting, leaf-curling, and any other tell-tale symptoms of the plethora of diseases that can effect tomatoes. As an organic farm, the best way to manage tomato diseases is with a hefty dose of prevention. The black plastic was helpful not only because it kept weeds down, but because it kept the plants from direct contact with the soil and prevented soil splashing. Maintaining good airflow is also vital, as moist stagnant air creates ideal conditions for fungal diseases. Our trellising system did not work as well as we hoped this year. Not only did we wait a little bit too long before starting trellising, but when we put the fence posts in we placed them too far apart. We greatly underestimated how much weight several tomato plants can put on a line, and with posts only every 8 or so feet, lines quickly stretched and broke, breaking branches and letting plants topple into the aisles. For next year, we suggest posts every 5 feet and frequent trellising starting while the plants are still very small. Once the plants are trellised, it is also important to keep them pruned. As a general rule of thumb for most varieties, a plant can only really support 2 or 3 main branches, and small shoots from the bottom of the plants are best removed. It is good practice to try to keep the center of the plant free of senescent plant material as well. Thanks mostly to the great tomato growing weather we had for most of the summer, we wound up with a plentiful harvest of tomatoes starting in August. The weather changed pretty dramatically around the end of August when we got inundated with rain from a couple of tropical storms, and the plants did not respond well to this. Within a week or two of the storms the plants started showing necrotic leaf spots characteristic of septoria, and productivity dropped off through September. The caged plants on the swales resisted the disease somewhat better. Luckily we had no signs of late blight this year, even though it was an issue for some other growers in the area starting about mid-august.
Cherry Tomatoes: Black Cherry, Gold Nugget, Tomatoberry, Yellow Pear- Cherry tomatoes have awesome selling power because they are one of the few things we grow that someone can purchase to eat immediately. We never had trouble selling out of 3 dollar pints or 5 dollar quarts. Manndible also purchased a lot of cherry tomatoes from us. If you are going to try to wash them, it is better to gently run water over them rather than submerging them. We found that if we submerged them they quickly absorbed enough water to crack. We grew an entire row split between Black Cherry and Gold Nugget, and highly recommend both varieties again. The Gold Nugget fruits early, and produces a constant abundant harvest of sweet golden-orange fruits. The Black Cherry is a new variety. The plants were some of our most vigorous, and while they took a bit longer to start fruiting than the Gold Nugget, they did eventually produce a prodigious amount of deep purple fruits with a delicious unique flavor. Because of their dark color they can be a bit hard to find under the foliage. We also grew a couple Tomatoberry plants. These plants produce interesting strawberry shaped super-sweet fruits. This variety is something of a novelty though, and we found that there was significant variability in how they tasted, and as the season wore on the fruits seemed to get smaller and smaller. Finally, there were a couple Yellow Pear plants. While these have great flavor, they are very prone to cracking and would not be a good variety for a large planting.

Hybrid Tomatoes: New Girl F1- We grew one entire row of New Girl, a new hybrid that is an improvement on their “Early Girl” variety. It performed as expected and produced tons of sturdy typical red slicing tomatoes, of which Manndible ended up purchasing the lion’s share. While the taste leaves a lot to be desired compared to most heirloom varieties, these tomatoes brought in a lot of money and were generally a lot easier to grow and deal with in the field.
**Heirloom Tomatoes:** German Striped Gold, Brandywine, Great White, Cherokee Purple, Black Krim, Black Trifele, Mortgage Lifter, Roma, Garden Peach, Green Zebra. We grew a half row each of Brandywine and German Striped Gold. Brandywine is a beefy pink tomato that is supposed to grow great in the PA/NY area. Overall we found it to be less attractive, less productive, and not as flavorful as the German Striped Gold. The German Striped Gold was quite productive, yielding lots of huge fruits weighing up to 2 pounds each. The fruits are an attractive golden color with interesting red blushes from the bottom, and their flavor is incomparable. We did get a pretty good harvest of these two varieties, but they do present some issues when compared to the hybrid tomatoes. For starters, these things are huge; so huge that they tend to snap entire branches and drag plants to the ground, no matter how well trellised they are. Also, to match farmer’s market prices, we have to charge at least 3 dollars a pound, meaning a single tomato can cost 6 or 7 dollars, which is enough to deter most college students. Additionally, the fruits need to stay on the plant so long to fully ripen that they often get deep cracks, making spots prone to insect entry and rotting. Lots of perfectly good fruit were unsellable because of a single rotten spot. In addition to the main row of heirlooms, we placed plants of many other varieties on the swales. Of these, the obvious best performers were Great White and Cherokee Purple. Both of these plants exhibited vigorous growth, good productive capabilities, and resisted disease until they were killed by frost. As the name suggests, Great White produces large (not quite as big as the German Striped Gold) smooth cream colored fruits with a refreshing tart and fruity flavor that was a big hit at our Field Day tomato tasting event, drawing comparisons to pineapple even. This variety too is prone to cracking and is somewhat fragile. Cherokee Purple produces large (again, nowhere near as large as the German Striped Gold) maroon colored fruits that are extremely soft, juicy, and perhaps the single most
flavorful and sweet tomato we grew. This too was a big hit at the tomato tasting event, and we think its flavor firmly settles the debate about whether the tomato is a fruit or a vegetable. Still, this variety was extraordinarily fragile, prone to cracking, and very popular among our rodent population, so is probably not a good candidate for a large planting. Black Krim and Black Trifele both produce flat and tear-drop shaped deep purple fruits respectively. Neither variety performed well. Mortgage Lifter is supposed to produce tons and tons of big red fruits, but for us they never matured past pink and were never very good. Roma is the classic paste tomato variety with high solids content. We did get a pretty good harvest for sauces. This variety is tried and true, and well enough known that a limited planting of it could be quite worthwhile. Garden Peach is something of a novelty. It produces plum sized yellow fruits with a unique fuzzy skin like a peach. We found them to be somewhat mealy and bland inside though, so don’t suggest this variety other than as an interesting conversation piece. Finally, we also had some Green Zebra plants which proved to be quite interesting. They produce a fruit that is greenish yellow with solid green stripes when ripe (you can only tell it’s ripe by feel and smell) and flesh that is quite green. This tomato is actually very sweet and fruity, with a flavor reminiscent of apricot. The mismatch of color and flavor is somewhat confusing.

Peppers: Culturally, peppers are grown much like tomatoes, except they generally do not need trellising or as much pruning (though removing some lower side shoots is helpful). Like the tomatoes, they were planted on heavily composted raised beds with black plastic mulch. Be sure to keep fertilized with regular fish emulsion applications.

Sweet Peppers: Ace F1, Antohi Romanian, Corno Di Toro- We grew a row and a half of standard hybrid red bell pepper variety Ace and a half row of a smaller Romanian variety that was supposed to ripen through many colors. The Ace variety performed quite well, never got any diseases or had any significant pest problems, and was quite productive. For next year, be sure to decide in advance which plants’ fruit you will allow to fully ripen. We wound up harvesting mostly green fruits because we never coordinated which we would let ripen fully. Still, the Ace peppers were consistently a good seller from late July until our very last sale on a snowy day in late October. When cleaning them try to remove the webs of ant-mimic spiders that like to hide in the crevices of the fruits. The only issue we really had with the Ace variety was some blossom-end rot caused by high temperatures and intense sunlight in mid-summer. The Antohi-Romanian variety was a different story entirely. We ordered the seeds imagining harvesting oodles of multi-colored mini peppers that are very popular right now. Right off the bat, the plants were much less vigorous than the other varieties. After transplanting they remained slow and somewhat stunted. Eventually they did start producing white cone-shaped fruit, but no matter how long we left these on the plants to ripen, they never seemed to get past a light orange color. At farm stands they were confusing to customers, who often assumed they were hot peppers, and they did not sell nearly as well as the Ace variety. This variety is definitely not worth growing again. In addition to these, we grew a couple plants of a long red classic Italian frying pepper called Corno Di Toro donated by Peace Tree Farm. Because the fruits were so long, they suffered from blossom-end rot for most of the summer, but as soon as temperatures cooled off a bit and rains became more regular they produced lots of beautiful thick-walled peppers that ripened fast and were hugely popular among any volunteer who knew what they were.
**Hot Peppers**: Serrano, Habanero, Poblano, Fish, Tabasco, Thai Hot, Jalapeno Gigante- Hot Peppers were a much bigger deal at Dilmun this year than they have been in the past, and we wholeheartedly recommend making them a regular crop. We devoted an entire row to our seven different varieties of hot peppers. Like the tomatoes, most of this diversity was made possible thanks to a donation of plants from Peace Tree Farm. We planted about a third of the row with Serrano peppers ordered from Johnny’s mostly because they were out of the more standard jalapeño. The Serranos were hugely productive from late July until freeze. They have more flavor than jalapenos with a comparable heat. They sold moderately well at farm-stands, and sometimes to Manndible as well. We also planted nine Habanero plants that really ended up proving themselves worthwhile. They took a lot longer to ripen than some of the other hot pepper varieties, but once the first fruit started turning orange we were inundated with the infernally hot peppers until freeze. These were really popular among the international community at farm stands. At the Campus Farmer’s Market the owner of the restaurant Xeo told us that he could not find any local growers of the variety, and offered to buy as much as we would sell him. We ended up selling them many pounds of the habaneros over the next couple weeks, and says he would be thrilled to do so again next year. Another variety that proved popular was Poblano. These larger dark green peppers are mildly hot, but full of flavor and very popular in Mexican cooking. Manndible wanted all of these we could provide, but as we only had 3 plants it was hard to provide them with a worthwhile amount. Fish pepper is an heirloom variegated cayenne pepper that was never very productive and only really provided an interesting conversation piece. Tabasco is a small pepper famous for the sauce that bears its name. It apparently needs a very long season to fully ripen, and is not a good variety for New York. Thai Hot is a very short thin-leafed plant that bears copious tiny red fruits that are extremely hot and full of flavor reminiscent of Sriracha hot sauce. They can be quite productive, but because they are so small it is very tedious to harvest any significant amount. The Jalapeno Gigante variety we planted bore lots of large pretty jalapenos that sold well. It would certainly
be worthwhile to grow more jalapenos next year. In general, it is somewhat difficult to sell the large quantities of hot peppers that the plants easily produce at the farm stand, but if you can make arrangements with Mandible and other local restaurants like Xeo, they are very lucrative.

**Potatoes:** Castile, Chieftain- We decided to plant as many tomatoes and peppers as possible and only grew one row of potatoes. We planted a bit late this year, but were still able to get a solid harvest that was mostly split up between the folks who helped us harvest them all. The potatoes got a little bit of superficial damage from flea beetles, which surprised us a bit. We also found some Colorado potato beetles, but luckily not more than we could smash by hand. Castile is a typical yellow potato great for frying and general use, and Chieftain is a typical red skinned potato great for boiling, mashing, and anything else really. Next year plant much earlier, and consider top dressing/mounding for a bigger harvest.

**Eggplant:** Nadia, Machiaw- As with the potatoes, we sacrificed eggplant space for more tomatoes and peppers. We started the eggplants around the same time as the tomatoes and planted them around the same time as well. We made absolutely sure to keep them row covered to keep flea beetles off, as this was a big issue for the eggplant last year. Despite these efforts and favorable growing weather, the eggplant was simply never very productive. In September we were able to harvest some quite small fruits for sale, and whatever we had always did sell. Nadia is a typical purple eggplant. Machiaw is a long, thin Asian variety that was much less vigorous but still produced some good fruits.

“Misc” families

Because we do not grow a ton of any one of them, the following plant families are treated as one unit in Dilmun’s crop rotation.

**Apiaceae**

**Fennel:** Zefa Fino- We had really good luck with transplanting fennel this year. The bulbs were never hugely popular, but we would consistently sell several at every farm stand that we had them. We recommend future managers start harvesting a few for each sale as soon as they are of a reasonable size, because they are prone to bolting way earlier than expected. We started selling them early enough this year to only lose a few to bolting. Definitely do not plant more than one 72 tray.

**Carrots:** Yellow Sun, Purple Haze, Mokum, Hercules- Had it not been for constant grazing by deer, this year’s carrot harvest would have been far better.

**Parsnips:** Javelin- Growing parsnips is essentially the same as growing carrots, they just take a good deal longer. Due mostly to limited space in the raised beds (which shouldn’t be an issue next year), our parsnips were seeded a bit late. Still, they got off to a good start. Unfortunately they were eaten back to more or less stumps by browsing deer on two separate occasions. This meant that they wound up pretty small,
but overall they were of pretty good quality. Next year, plant parsnips a month or two earlier, keep them protected from predation by deer and groundhogs, and don’t harvest until late October and you should get a superb crop. Also, be sure to thin to about 2 inches between plants before the roots get too big.

**Parsley - Curly** - We planted 50 curly parsley plugs donated by Alex’s parents’ greenhouse, Peace Tree Farm, and it turned out to be a worthwhile crop. We were able to sell some bunches at the farm-stand, and on a couple occasions sold bunches to Manndible as well. A limited planting of parsley like this is certainly worthwhile and provides some good experience working with herbs. Note that there are several weeds in same plant family that look very similar to parsley, and some of these are actually poisonous, so be careful when harvesting to not include any weeds.

**Dill - Bouquet** - We also planted about 50 Dill plugs also donated by Alex’s parents. These bolted quickly, but we were able to sell some flowers in herb bunches. The flowers eventually got attacked by some silk-spinning caterpillars and became unsellable. If you also had a good crop of cucumbers, selling dill flowers and leaves could be quite lucrative.

**Celery - Tango** - Celery takes a lot of work and planning, but if you do it right it can turn out fantastic like it did for us this year. Our celery crop was without a doubt one of our greatest success stories of the summer. Celery transplants needed to be started very early as they are slow to get going. At transplanting they need to be very deep, so we ended up digging a deep (probably 8 inches) trench down the middle of a freshly plowed raised bed. Celery is also an extremely heavy feeder, so we filled the trench in with compost and planted the plants such that about 2 inches of leaves were sticking out of the soil. It is also absolutely essential that celery never, not even once, be allowed to wilt, as this will make it very stringy and undesirable. To prevent this, we immediately laid out a drip-tape line, turned it on (so it wouldn’t get pinched shut) and lightly buried it. Fish emulsion was sprayed on the celery weekly, and it was watered frequently. As the plants got larger, we mounded more soil around the sides to try to bury and blanch the growing petioles. By mid-August, our hard work was rewarded with a perfect crop of huge, juicy, flavorful celery heads that fetched a good price and always sold well.

**Cilantro/Coriander** - Cilantro could be a very popular crop, a lot of customers ask for it specifically. This year we tried cilantro twice. The first time we tried to transplant it, but this proved to be an ineffective way to grow it. The transplants showed signs of nutrient deficiency while very small, and bolted immediately after transplanting in the field. Rather than toss this crop out, we let it flower and go to seed. In the early fall we pulled all the plants and dried them on racks in the barn, and had volunteers help us separate the coriander at a rainy day work party. While we didn’t sell any of it, working with growing a spice like this was a great activity for volunteers and gave them an appreciation for how even the contents of their spice rack are related to agriculture. We direct seeded a second planting of cilantro in early August, and it performed quite well but was not quite big enough for easy harvesting by the time it got too cold. We highly recommend doing two small plantings of cilantro in June and July, and letting some go to seed when it bolts for volunteers to learn where coriander comes from as well.
Asteraceae

**Lettuce Mix:** Encore, Red + Greens Mix- For many small farms, lettuce mixes are one of the most profitable crops. They have a quick enough turn-over that pests don’t really have time to become an issue, and it can be really productive with a small space. At Dilmun the main issue with these crops was that it took a long time to harvest and wash by hand, but for next year we purchased a greens harvester that should make this task a breeze. For next year we recommend planting at least one entire raised bed with a baby lettuce mix as early in the spring as possible, and then a second about 3 weeks or so later. Our first planting was very successful, and about a month after planting it we had enough to make our first big sale to Cornell Outdoor Education- Enough lettuce to feed 100+ people! COE would certainly love to have this be a yearly purchase. Our second crop sadly got entirely mowed down by a voracious groundhog the day before we were going to harvest it (this and the early beets is what prompted our aggressive anti-groundhog campaign). Once the weather got hot in June we had a lot of trouble getting these mixes to germinate, and then keeping the compost of the raised beds moist enough to keep seedlings alive. Timing a fall crop can be a bit tough, as you don’t want to plant it while it is still hot enough that germination will be poor, but you also don’t want to wait so long that it gets cold and slows growth too much, but right around the first of September is probably an ideal time. Past managers have said they had trouble selling lettuce mix pre-bagged, but we certainly had no trouble doing so in the spring. We would, however, recommend getting a nice basket or something to display the greens and let people bag their own. Past managers have also sold bags of lettuce mix at the Cornell Orchard Store, and while we never had enough excess in the fall to do so, the Orchard would certainly be interested in selling it again in the future.

**Head Lettuce:** Red Cross, Winter Density, Anthony’s Romaine, Simpson Black Seeded- In addition to baby lettuce mixes, we had really good luck with growing head lettuce too. Head lettuce tends to all need to be harvested about the same time, and bolts pretty soon thereafter, so don’t plant more than you can sell in a 1-2 week period at any one time. For next year we’d recommend seeding about one tray at a time maybe every four weeks or so from mid to late March to mid-August. Winter Density proved to be a very good early and late season variety. Our first crop of the more heat-tolerant Red Cross did great and resisted bolting as well as we could have hoped, but our second mostly bolted while still relatively small. We also planted a romaine variety given to us by Anthony, a regular volunteer over the summer and fall, which was looking great until it got devoured by a pair of deer that found their way inside the fence in October. We planted a few Simpson’s Black-Seeded, a classic crinkly leafed green variety, from seed left in the barn from last year, and it also performed fairly well in the early summer. We definitely think both Red Cross and Winter Density are worth growing again, we also think it would be cool to try
some different head-lettuce varieties as well.

**Sunflower:** Royal Hybrid- We planted sunflowers as something of an experiment with growing an oil crop. The idea originally was that at some point in the early fall we could have a large meal made entirely of Dilmun grown ingredients, oil and all. We did end up harvesting a lot of sunflowers seeds, but sadly a lot of them got eaten by small worms and other bugs in storage before we could press them, so not much ever came of it. Our harvest was probably not as good as it could have been because we had planned on transplanting the sunflowers at the same time as the tomatoes, peppers, cucurbits, and other crops that all get planted around June 1st, so obviously they took the back-burner and got a little bit stretched before being transplanted. Planting younger would likely get much better yields. In addition to a nice patch on Tortilla Flats, we also planted a patch on a bare spot on the swales. The spot on the swales really made the hillside look much happier from the barn, and was actually a good cover to have on the bare spot. For next year, consider planting a more ornamental variety for cut flowers, but still do some for seeds/oil as well because volunteers really enjoyed learning about and working with this type of crop.

**Other Families**

**Okra:** Millionaire, Green Fingers- Most people scoff at the idea of anyone liking Okra, much less at the idea of growing it in Upstate New York, but Dilmun Hill is all about being unconventional. We planted not just a few Okra plants, but an entire row of it. We grew Millionaire, a variety from Johnny’s, and Green Fingers, which was donated by Alex’s parents at Peace Tree Farm. The varieties were all but indistinguishable. Even though the summer was hot and dry, the Okra simply didn’t branch out and grow tall like we hoped it would. There was obviously some pest doing significant damage to the leaves that we never once actually saw in action. Still, the plants put out tons of flower pods, which we tried our best to keep ahead of harvesting while still small enough to be tender. Whenever we did have Okra at the farm-stand, it was in extremely high demand, particularly from Cornell’s international community. For next year, we recommend growing about half of what we did this year, and using black plastic mulch for higher temperatures.

**Nasturtium:** Kaleidoscope Mix- Nasturtiums are a tradition at Dilmun Hill. This year, rather than planting a solid block of Nasturtiums, we decided to make a nod towards companion planting by putting a nasturtium plant at the end of every row. While we doubt this had any real impact on pests, beneficial insects, or plant growth, it was a nice thing to point out to visitors and it lent some extra beauty to the field. We were able to sell pints of flowers to Mandible and at farm stands on a few occasions, but as the season wore it proved too time consuming. If you are going to sell Nasturtium flowers, note that they will wilt extremely fast and should only be picked directly before they are going
to be sold. Additionally, try to pick before it rains, as any real rainfall will shred most of the flowers on the plants.

**Sweet Corn:** Double Standard- As with the beans and peas, we decided to go the unconventional route of transplanting corn this year. We thought the heavy clay soil would make it difficult for direct seeded corn to germinate, and were probably somewhat correct in this assertion. In the late May/early June planting craze, the corn took the backburner to things like the Solanums and Cucurbits, and as a result it got kind of stretched and went in the ground way older than we had planned on. Because of this the plants began sending up tassels and ears soon thereafter while the plants were only a few feet tall. We got some cute little mini-sweet corn ears that did taste good, but were too small to sell. If you plan on transplanting next year be certain you’ll have time to plant while the transplants are still young. This may mean planting a bit later (mid June even), but having the earliest sweet corn crop is not as important as having a good one. In the past managers have tried growing interesting decorative and popcorn varieties. If you do grow more than one variety of corn, be aware that the pollen source for corn determines the quality of that year’s kernels (for example, if you cross sweet corn varieties with different sweetness genes, the crop will often be bland like field corn). For watering and space use purposes, it’s good to plant in rows, but corn needs to be planted in more of a block to ensure it gets pollinated.

**Basil:** Mix, Lemon, Purple, Sweet- We experimented with several varieties of basil this year, and the consensus that we came to is that Sweet (Genovese) basil is the only one really worth growing. We started the season with flats of Lemon and Purple basil donated by Alex’s parents. Both of these grew well, and we did manage to sell some lemon basil before it bolted. Still, we both felt these varieties did not have very good culinary qualities. When these plantings started to bolt, we decided to leave them as forage for honey bees and other pollinators instead of pulling them out. We also found a packet of mixed basil varieties leftover from last year, and seeded a tray of it in the greenhouse. Some of these varieties proved worthwhile, but most (like Anise Basil) were pretty foul. Finally, we decided to just buy some sweet basil seed and grew a flat of it in the greenhouse. This sweet basil was always in demand at farm-stands, and we always wished we had more. For next year, we would recommend doing several plantings of sweet basil through the summer. Don’t let the plants get too old before transplanting or they will be prone to bolting early.

**Perennial Crops**

**Paw-Paws**- Dilmun has a well-established stand of productive paw-paw trees that are an awesome resource. This year we engaged volunteers in the spring by doing a hand-pollination activity. This basically involved taking small paint-brushes and shot-glasses, gathering pollen from a male-stage flower one tree, and
moving it to a female-stage flower of another tree. There are lots of online resources that can show tell you more about the biology of paw-paw flowers and provide visuals for what a flower looks like in the female stage as opposed to the male stage. Keep in mind though that paw-paws tend to be self-incompatible, so crossing trees is essential for good pollination. Our pollination efforts were rewarded with fantastic fruit set at the heights that people had been able to reach, and we wound up harvesting about 100 pounds of paw-paws in early October. We gave lots of paw-paws to volunteers, and also sold a good amount of them at a farm-stand. Currently many of the trees are suckering and growing into more of a thicket, as they have a tendency to do in the wild. A management decision should be made as to whether we would rather have a more natural thicket like stand, or a more conventional orchard stand of single trees.

**Apples**- Dilmun has two apple trees on the swales by the Market Garden. One is an unknown red variety that bore lots of small fruit in September and October, and this tree appeared to be in quite good health. Unfortunately, it got attached by a Sapsucker (a woodpecker-like bird) in the fall, and has some pretty serious bark damage that may reduce its productivity next year. The other tree is somewhat smaller, and bears a later crop of pink-blushed yellow apples. This tree has some cankers on the trunk, and may be infected with fire-blight. For good production and quality apples need a good amount of work that may simply not be worth it for our two trees. For example, it is probably not worth it to treat the trees with something to try to ward off boring insects or apple scab, but thinning fruit-set in June/July could be an interesting activity for volunteers.

**Blueberries**- Dilmun has lots of blueberry bushes that are suffering from high soil pH. With a year or two of proper management they could be a great crop for the farm, and we tried our best to get that ball rolling this year. Not only did we try to keep weeds down around them, but we applied sulfur to the base of many to lower the soil pH. Much more sulfuring will be necessary in subsequent years, but coupled with some pruning and mulching these bushes could be quite productive.

**Hardy Kiwis**- This year was the first year in memory that the Hardy Kiwis fruited. Normally the flower-buds are killed by a late spring frost, but none such frost came this year and the plants flowered abundantly and set fruit readily. It wasn’t until just before fall break (mid-October) that the fruit were soft enough to eat, and we found that the softer they got the sweeter they tasted. We were able to harvest a good amount, but because they were so amazingly delicious we had no problem eating all of them among managers,
volunteers, and visitors. The trellises that were rebuilt by last year’s managers bore the most abundant fruit. We can only hope the vines will start fruiting more consistently, because they were a real treat.

**Other Trees** - In an attempt to move the swales away from annual production back into perennials, we planted several new trees onto the swales this summer. Isaac planted a choke-cherry purchased at the Farmer’s market, and Peter contributed a couple American Persimmon and Serviceberry suckers dug from the herb garden and elsewhere. Hopefully these young trees will take and add some more tree diversity to the farm.

**Strawberries** - Again, in an attempt to bring the swales back into perennial production, we planted about 150 strawberry plants donated by Alex’s parents at Peace Tree Farm. Both varieties are geared towards horticultural production, rather than field production, so they may not be quite as productive. Both varieties are day neutral, meaning they will flower and fruit all season. One of the varieties has unique deep-pink flowers (rather than the usual white). We pulled flowers all season to encourage the plants to grow vegetatively and get established for next year, and by the end of the season most were runnering and appeared well established. With any luck, next year’s managers should enjoy a good crop of sellable strawberries!

**Rhubarb** - Last year’s managers planted a small patch of rhubarb in the pioneer garden, and we worked to get this patch better established and expanded it by planting some more rhizomes. This year we harvested a bit of it in the spring, but tried our best to let it get better established. It is really easy to lose the rhubarb in the burdock that pops up in the spring, so future managers will need to keep on top of it.

**Horseradish** - This year we added some horseradish from the old herb garden to the pioneer garden.
Appendix

Sample Invoice
Invoice #13        September 6, 2011

Manndible Café
Mann Library
Cornell Campus

Invoice

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Dilmun Hill Student Farm Produce Delivery

Dilmun Hill Student Farm
Rt. 366 and Pine Tree Road
Cornell University Campus
Contact #: 610-955-8511 (Alex Traven)
Contact #: 845-323-3168 (Isaac Arginteanu)

Please mail check to:
Betsy Leonard
147d Plant Science Building
Cornell University Campus
Ithaca, NY 14853
Contact: 607-423-8366
Alex created two extensive spreadsheet calendars that were instrumental in tracking and planning our plantings and harvests. Future managers should definitely use/adapt these calendars to their plans. Betsy or Anja should have a copy of the spreadsheet files should they be needed.

**Useful Contacts**

**CUAES:**

**Anja Timm** ait4@cornell.edu
Anja maintains the Dilmun hill website and also knows a lot of the history of Dilmun’s relationship with administration & dining. She needs to be updated with events as quickly as possible so she can post them to our website.

**Mike Hoffman** mph3@cornell.edu (607) 255-2552
Associate Dean of CALS
Director of CUAES
Professor of Entomology
Dr. Hoffman’s lab lent us sweep nets to catch insects with the school field trip visitors, and as the director of CUAES he will visit the farm at least once to see what’s going on at the farm. It’s important that he knows what’s happening at Dilmun, being our most senior advocate in CUAES.
Tim Dodge
255-3234 (campus),
327-2844 (mobile)
Plant Breeding Supervisor III Love Lab
Tim is the man to talk to if you need mechanical help, gas, straw, tractor work or just about anything

Media and Communications
Craig Cramer cdc25@cornell.edu
Craig helps us out when we print big things, and also has a camera that can be borrowed. He’s an expert in all forms of communication.

Orchards
Eric Shatt ecs222@cornell.edu 607-255-4543
Eric is the farm manager at the Orchards. He’s really friendly and (so far) likes us; give him a call when you are ready for the irrigation to be turned on. Also, call him every time before harassing the blueberries (and make sure managers from other projects do the same) because the orchard staff need to know if students are planning on being in the patch. The orchards also have some specialty tools that might be useful like high-tensile fence splicers that they will let you borrow with advance notice.

Manndibles
Kathleen Pasetty kpasetty@yahoo.com
Kathleen is one of the owners of mandible and a huge asset to the farm. She’s very supportive of managers in relation to ordering and logistics. Occasionally she will put us in email contact contact directly with managers at the café or the chef in their commercial kitchen across town.

Pam Gueldner pam@manndiblecafe.com
Pam is a co-owner of Manndible cafe. Last year most of our communication was with Kathleen, but Pam also buys from Dilmun.

Sharon Corbitt manndiblekitchen@yahoo.com
Sharon is the chef at the Manndibles commercial kitchen, and should be included in the order form and availability communications.

Mann Library
Angela Morse amf6@cornell.edu
Building Coordinator for Mann Library. She is the person to contact if you have issues with the online reservations system for lobby or room space.

Jeff Piestrak jmp36@cornell.edu
Outreach Specialist at Mann Library. He organizes the annual Food and Fiber Fair and other cool events.