

Winter Solstice: Time and Space

Hoping you are all keeping your activities to a duller roar and allowing time for reflection and... FUN!

--> Need to discuss? Got something you need looked at? URI Extension: 401-874-2967/andy_radin@uri.edu, hfaubert@uri.edu

Budgeting for the next growing season, and beyond

Though you may be producing and selling little to nothing during these longest nights of the year, you are, no doubt, dreaming of a “better than ever before” 2020 growing season. Usually that means more production. Production process mistakes and instances of neglect poignantly stick out in our minds, as do certain “acts of God” that are just part of the “fun” of farming. We also know that we can always do better.

Winter is a good time for examining “bottom line” issues. Are there ways to spend less to achieve similar outcomes? Are there options to spend more but realize greater returns? Now is the time to examine your annual spending habits. This can be done using Enterprise Budgeting. Your whole farm is one big enterprise, but within it, you most likely have many sub-enterprises, like growing high tunnel tomatoes, or bunched basil, or salad mix. Each one of these has its own set of unique activities and expenses, though there are some common to all of these sub-enterprises, like bed preparation, irrigation equipment setup, and mulching material. Some produce has a higher value per unit than others, some is easier to pick, some crops are less competitive with weeds. It makes sense to document comparative allocation of your resources among all of these crops, doesn't it? You may have something of an idea how these enterprises stack up next to each other, but having these in writing, built into spreadsheets, gives you the ability to check back and tweak from year to

High Tunnel Multiple Product Vegetable Farm Budget Example

Ag Decision Maker – Iowa State University Extension and Outreach
The publication on [High Tunnel Production Budgets](#) has more information on the cost and returns for multi and single crop high tunnel production.

Place the cursor over cells with red triangles to read comments.
Enter your input values in shaded cells.

High Tunnel Size (sq. ft.) (30x72)	2,150	ft.		
Utilization	84%			
Approximate Original High Tunnel Cost	\$7,000.00			
Receipts				
CROP	Yield (lb.)	Sq. Ft.	\$/lb.	Total
Cucumbers	567.0	454.0	\$2.00	\$1,134.00
Eggplant	204.1	45.0	\$2.00	\$408.24
Greens	166.9	383.0	\$7.00	\$1,168.47
Herbs	14.5	9.0	\$16.00	\$232.24
Lettuce	208.7	181.0	\$7.00	\$1,460.80
Peppers - Bell	290.3	181.0	\$2.00	\$580.61
Tomatoes - Slicers	1315.4	454.0	\$2.50	\$3,288.80
Tomatoes - Grape	342.9	127.0	\$4.00	\$1,371.59
Total Receipts		1814.0		\$9,844.44
Annual Expenses				
	Total			
Seeds/Transplants	\$135.00			
Fertilizers	\$108.00			
Miscellaneous Supplies	\$125.00			
Water	\$88.40			
Water Test	\$17.00			
Irrigation Supplies	\$122.00			
Total Annual Expenses	\$593.40			
March - September				
Labor Costs	Hours	\$/Unit	Total	
Bed Preparation	17.00	\$12.00	\$204.00	
General Maintenance	23.00	\$12.00	\$276.00	
Planting	10.50	\$12.00	\$126.00	
Pest Management	0.00	\$12.00	\$0.00	
Harvest	48.80	\$12.00	\$585.60	
Total Annual Expenses	99.30		\$1,191.60	
Ownership Costs				
	Annual			
Depreciation - Tunnel	\$875.00			
Depreciation - Plastic Cover	\$113.40			
Total Ownership	\$988.40			
Total Costs				
Tunnel	\$2,773.40			
Per Square Foot	\$1.28			
Annual Returns Over Total Costs				
Tunnel	\$6,871.04			
Per Square Foot	\$3.18			

year. Enterprise budgeting is a management tool. If you aren't already doing this, NOW (in the dark and cold) is a great time to set up the groundwork, even if you are starting out with estimates for plugging into your spreadsheets.

Luckily, Craig Chase of Iowa State's Ag Decision Maker program created a great set of spreadsheets in

MSExcel which you can use, as is, or modify to your specific needs or design preferences. It can be found here: <https://www.extension.iastate.edu/agdm/crops/html/a1-23.html>. If you want to alter it after downloading it, you will have to “unprotect” the file from within Excel. Open the **File** menu, click on **Info**, click on **Protect Workbook**, and click on **Unprotect**. (This is for Windows machines.) Note that the spreadsheet has two example tabs (multiple crop and single crop) and two blank tabs (multiple crop and single crop). While this was designed specifically for high tunnel crop production analysis, you can substitute any square footage you want, whether they be areas of high tunnel beds or field beds.

Don't get hung up on entering exact numbers for all of your expenses and all of your sales. As you get more used to doing this, you'll document these more faithfully. Educated estimates are fine to start with- it can tell you a lot about your own perceptions of how you allocate resources, especially labor. Eventually, you may find out which crops are very profitable and which are not- and this could influence your operation substantially. You may also wind up confirming your suspicions of which crops are dragging down your profitability, which could push you over the line about scaling back or eliminating them. That may have a bigger effect in forcing you to look beyond individual enterprises to your whole farm business. Enterprise budgeting is a management tool. See if it can work for you.

Taking care of your investments

As time goes on, you find yourself purchasing more and more tools and machines. Hand tools at first, then tools with engines, and then walk-behind tractors and then even tractors with *seats*! These items should last you a good long time as long as you take good care of them. Now, at the start of the winter, is a good time to ask yourself if you really *are* taking care of them.

First and foremost is to get tools under cover for the winter. It's not unusual to see forgotten items out in the weeds. It happens, on occasion. But if it doesn't happen on your farm just *on occasion*, maybe you want to consider tightening things up a bit. In some

cases, the measure to be taken is to talk to your field hands, the ones who didn't spend their own money on these important pieces of equipment. But it is up to you, the entrepreneur, to stay on top of this. Good quality, simple hand tools cost \$60 a piece at a minimum, and more than \$200 for special items. If they have wooden handles, mineral oil them in the winter. If the structural steel parts are beginning to rust, wire brush them, and then spray on a light coat of clear anti-rust primer paint.



Some day, all small farm equipment will feature electric engines, which require very little maintenance. Until then, your gas engines need attention.

Smaller, hand-held machines like weed-whackers and chainsaws use two stroke engines, which are more efficient with fuel use and don't require gravity to maintain an oil reservoir. But because the engine is oiled by using a fuel and oil mixture of about 50:1, they don't burn as cleanly. (They are “two stroke” because one complete rotation of the crankshaft takes place with one complete up-and-down of the piston; a “four stroke” engine accomplishes one complete rotation with two complete up-and-downs of the piston.) Most of what is listed here applies to both, except oil.

1) **Keep a clean engine.** Small engines are air cooled, which means that they rely on air directed over the surface of the engine block's cooling fins by fan blades on the flywheel. This flywheel is located under a shroud. Do you ever look in there? Dirt, weeds, and mouse bedding can accumulate in there, reducing the amount of air that can be drawn in. Figure

out how to remove the shroud so you can make sure it's clean inside. On pull-start engines, this is the assembly that includes the cord. The same goes for the engine block itself. If there is soil caked in the cooling fins (the linear protrusions around the outside of the engine), cooling will be less efficient. Often debris settles into the socket where the spark plug screws in. Blow this out with compressed air or a hard stream of water, but make sure it's dry before removing the plug, else leftover water will drain right down into the cylinder, which is a place where water does NOT belong.

2) Check the **exhaust pipe and muffler**, making sure there are no holes and that the spark arrestor, which is a screen, is in place. It may actually be inside the muffler, so to inspect it, you need a cool engine so that you can open the muffler. But many mufflers are solid assemblies so inspection is not possible. If things are rattling around inside, it should be replaced.

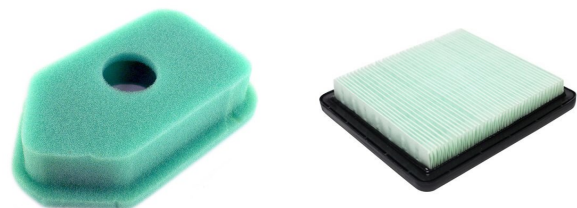
3) **Engine oil** should be checked with some regularity, although eyeballing the engine for leaks is the first step. If there is oil coming out by the filler plug, there's probably too much oil in it. This is not good: it can cause the engine to overheat and the oil seals will fail. Don't make this mistake. Also don't underfill – this results in too much friction, which then creates (you guessed it) too much heat. Four stroke engines typically require SAE30 oil, unless you operate the machine in cold weather, in which case you would use 10W-30. If you are using a two stroke engine, make sure that you get an oil specifically designed for that purpose, mix it with gasoline in the right proportion, and store it in a container that is marked "MIX".

4) **Spark plugs** should be inspected after a season of good running. If the engine is *not* running well during the season, it should be checked. When removing the plug, make sure to blow compressed air around the outside of the plug first (a well-directed pop of your breath will work out in the field), especially if it is recessed into a cavity– you don't want to unscrew it and watch a big chunk of greasy dirt drop right into the cylinder. Examination of the electrodes can tell you how your engine is running. The following picture is a classic. This is what you would like to see: beige color, very little dark sooty deposits, and



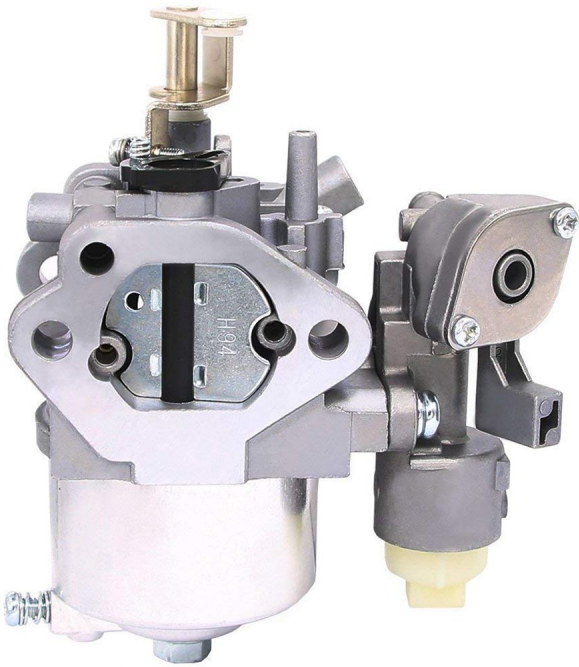
the electrodes show no loss of material. Also, the gap between the two should measure correctly, according to specifications of the engine manufacturer. You can check this with a gap tool, and also use that to bend the top electrode so that the gap is correct. If you see wetness or black, or gray ash, or eroded electrodes, your engine has not been running right. That may be from restricted air flow (keep a clean air filter) or a dirty carburetor, or carburetor out of adjustment or dirty gasoline. You should not have to replace plugs every year, but if it's grimy and eroded, do replace it, but also figure out why the engine isn't running right.

5) How about that **air filter**? It's pretty common to find air cleaners caked with dirt. That's what it's supposed to do, to a point. Once it's caked with enough dirt, it will restrict air flow, which means your engine will be running with a "rich" mixture of gasoline vapor and air. This fouls the spark plugs and the piston



rings. The idea is to run as "lean" a mixture as possible without compromising engine power. The air cleaner is a removable housing that covers the carburetor. It contains filter element/cartridge, which is totally replaceable or it can be blown out with compressed air. Some units may contain a foam sponge, which is supposed to be periodically cleaned using mineral spirits and then soaked in clean foam filter oil. Don't wring out the excess oil too strenuously or you will rip the foam. Be sure to clean out the housing itself with compressed air before putting the element back in.

6) Since you have the air filter housing off, you can **check the carburetor**. Cleaning a carburetor is typically not something that has to be done yearly, and is probably not necessary to consider unless your



engine chronically runs roughly. If you do choose to do it and this is new to you, there are numerous youtube videos that will take you through it. But also, if you have a digital camera, take good photos as you go so that you can easily reassemble what you've exploded into 25 pieces on the table. And you will need carburetor cleaner, which is not a pleasant chemical, so this should be done with very good ventilation, or else outside. Make sure the carburetor is properly adjusted. This takes some practice. These needle valve screws adjust the leanness of the mixture at idle speed and at full throttle. Again, check with Youtube.

7) **Control cables** are really convenient when they work well, so now is the time to figure out what doesn't work and fix it up. That may be as simple as lubricating linkages and making sure the cable wires slip easily, but might also mean adjusting or replacing. Sometimes these have to be ordered directly from the manufacturer, or you can have them custom made. In some cases, you will make do without if the cost can't be justified.

8) **The Machine Itself** is driven by a happy, healthy engine. If the machine has rotating parts, it probably

has bearings, which often have grease fittings. If you have a few machines that have grease fittings, you need to own a grease gun. You also need to be straight on which end to open and reload tubes of grease. Here's a fine little video from "Ghetto Wagon" on how to do just that: https://www.youtube.com/watch?v=S_hA18CwxXw

9) Some machines have transfer cases or **gear boxes** that are partially filled with suitable gear oil, and all the gears live in a bath of oil as they spin, spin, spin. Make sure you use oil with the right viscosity (often 80W-90). Often, these gear boxes have a plug on the side for checking level, though some will also have a dipstick. When checking engine or gear box oil, the machine should have been sitting for a while to allow all of the oil to drain back down to the bottom of the crank case or gear box.

10) **Blades and tines** grind away over time. Blades can be sharpened, and your machine (and engine) will not work as hard with sharp blades. Tine or spade replacement is a function of use and the texture of your soil. Those of you growing in mixed glacial deposits will replace more often. Again, your machine will work better with less worn tools, and you, yourself, won't work as hard if the tool is performing at its full potential.

11) **Tires** that leak are, quite literally, a drag, both on you and the engine. Don't be dragged down by semi-flat tires. Inflate to the right pressure, and replace chronically leaky tires.

12) **Build a collection** of shop tools, and take care of them. If you are lucky enough to have a shop space, put them away, and organize them. Looking for tools can be an incredible time-drain and frustration-builder. Make sure that your farm helpers put all tools away in a dry area. That includes both farm tools and shop tools. Your fluids should have a storage area as well.

Tractor maintenance is another level. Work on small engines first before going too deep into your tractor, but also, don't be afraid to perform fixes on less complicated assemblies. The more you understand how your machines work, the longer they will last because you will understand the what is demanded of them and what are the forces that stress them.