

Garden Tools/Equipment: Acquisition, Maintenance and Repair

Gardens Summit 2019

Presenter: Kurt Schneider

February 16, 2019

Hand Tools to Consider for Community Gardens

- Spading or Garden Forks
Note: Inexpensive forks have flat or rectangular tines whereas more expensive forks have a triangular shape to the back side of the tine. The triangular ones tend to not bend or break as easily.
- Long-handled shovels with rounded blade
- Short-handled shovels with “D” handles and straight edge blade for edging
- Garden rake (straight metal). Leaf rakes are of limited use at the garden.
- Hoes, both the one you’re probably familiar with and styles frequently used by southeast Asian gardeners
- Fence post pounders
- Small hand tools such as trowels, pruners and cultivators if your garden is interested in supplying these. Most gardens only have larger tools available that are difficult for gardeners to transport.
- Hand saws and/or loppers if you have communal plantings such as grapes or raspberries to maintain at work days
- Wheelbarrows

Where to purchase hand tools:

Used:

- Habitat for Humanity Restore, Goodwill and St. Vincent De Paul
- Garage sales
- Estate sales
- Craigslist or Freecycle. If Craigslist, one can occasionally persuade the seller to donate the item to your garden.
- Keeping an eye open on trash days can often prove useful. However, it is generally illegal to pick something off the curb that is intended for trash. Check with homeowner before taking.

New:

- Inexpensive vs expensive (consider purchasing inexpensive tools if tools are left unlocked or if theft is an issue)
- Menard’s. A couple times a year they have a good sale on inexpensive garden forks, shovels, garden rakes.
- Local garden centers and hardware stores will generally be more expensive, but if you tell them it’s for your community garden, they may offer a discount. If you are a non-profit, providing your Certificate of Exempt Status (CES) number will save you the sales tax.
- Be sure to save the receipt and write the purchase date on the tool. Some stores are very liberal with their return policies.

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Maintenance of hand tools:

- At a minimum:
 - Encourage gardeners to clean dirt/mud off tools
 - At work days, have volunteers clean tools with wire brushes to remove hardened dirt
 - Once a year, consider lightly sanding wooden handles and applying a coat of linseed oil/turpentine (1:1) to preserve handles
- Shooting for the stars:
 - Set up a 5-gallon bucket of sand mixed with $\frac{3}{4}$ quart of mineral oil for gardeners to plunge the tool into to keep rust from forming on blades of shovels or tines of garden forks
 - Sharpen blades of shovels and hoes if you have a gardener with a metal grinder at home
This may also be done by hand with a file.

Repair of hand tools:

- Handles
 - For handles that separate from the business end of the tool, possible solutions might include:
 - After re-inserting the head of the tool into the end of the handle drive in a metal wedge to tighten the fit. Metal wedges are very inexpensive and available at most hardware stores. They are most commonly used to secure a hammer head to its handle.
 - For tools where the head is part of a metal sleeve that fits over the handle (such as a shovel) drilling a hole through the metal sleeve into the handle and inserting a screw or nail can secure the handle. This generally does not work on garden forks or straight-back rakes because the metal sleeve is not part of the tool's head.
 - For D-handles that come off the top of the tool, consider the screw method as well.
 - If you need a replacement handle, consider finding a used tool at a Habitat for Humanity Restore, Goodwill or St. Vincent De Paul. It is often less expensive to remove a handle from a used tool and use as a replacement handle.
 - New handles are available at well-stocked hardware stores but are often a little expensive.
- Bent garden fork tines
 - For bent garden fork tines, you can use a short length of metal pipe such as used in plumbing applications to straighten tines of garden forks
- Wheelbarrows: Flat tires are the most common problems you'll encounter
 - Check valves for leakage and replace the valve core if leaking. If the leak is from the stem of the valve, tube replacement is needed.
 - If you have a flat tubeless tire, a tube can be inserted in the tire for repair
 - Patching or replacing inner tubes
 - New inner tubes can be purchased at well-stocked hardware stores
 - Replacement handles can be purchased at big box stores and many hardware stores
 - Replace lost or worn bolts and screws. These can be found at the hardware stores. If they don't have the correct size or style, often they can order it for you.

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Gasoline-Powered Equipment

- Grass/lawn mowers (2-stroke and 4-stroke engines available)
 - Stay away from 2-stroke engines (which require a gasoline/oil mixture as fuel) as they are harder to maintain and repair than 4-stroke engines, plus they pollute significantly more.
 - Self-propelled models are nice but present another layer of cost and repair knowledge.
 - Mulching mowers are fine for community gardens but may cost more if you're considering purchasing new equipment.
- Weed trimmers/weed whackers/string trimmers
 - Stay away from the cheapest priced models as the quality is significantly inferior to the middle to upper priced range of trimmers. If you are going to be trimming tougher and longer weeds/grass, consider a bigger engine (32 cc versus 21 cc).
 - 2-stroke engines versus 4-stroke engines:
 - From Wikipedia: Most trimmers use two stroke engines and require gasoline mixed with oil. Due to pollution laws four stroke engines are becoming more popular with a number of commercial weed eater models now being powered by four stroke engines. For instance, Honda, MTD and Craftsman manufacture a four stroke engine trimmer. Other companies, such as John Deere, now carry low-emission two-stroke engine trimmers. Stihl manufactures a hybrid four stroke engine trimmer using a technology called 4MIX. 4MIX trimmers have no oil reservoir. This engine is lubricated using pre-mixed gasoline, like any other two-stroke engine.
- Rototillers
 - There are two types: Rear tine and front tine rototillers referring to where the tines are located in relationship to the engine. Rear tine models can be more difficult to handle. Front tine models are easier to handle and have the added advantage that they can be maneuvered closer to obstructions such as fencing within plots.
 - The engines on rototillers are essentially identical to grass mowers and require similar maintenance.
 - There are smaller front-tine tillers that operate with essentially a weed trimmer style engine (e.g., brands Mantis and Earthquake) but often are underpowered and till to a relatively shallow depth.

Where to purchase gasoline-powered equipment:

Used:

- Habitat for Humanity Restore, Goodwill and St. Vincent De Paul
- Garage and estate sales
- Craigslist or Freecycle
- Gardeners who have downsized their homes to condos, for example
- Curb (same warning as above, ask before taking). This can be a good source as most often a simple fix can get them going.

Note: Most used mowers will have 4-stroke engines. Unless you have the testing equipment and know how to evaluate a used engine, it might be wise to pay no more than \$40 for a mower, \$30 for a trimmer, or \$100 for a rototiller. In assessing used equipment, of importance is

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cylinder compression and strength of spark. Generally, if you can spray starting fluid in the spark plug hole, replace the spark plug and get it to start, it's probably worth purchasing.

New:

- Mowers: Brands of cleaner burning mowers (4-strokes) are Troy-Bilt, MTD, Husqvarna or Honda.
- Trimmers: Echo, Husqvarna, Stihl
- Rototillers: Troy-Bilt, Craftsman, MTD, Yard Machine (made by MTD), Honda

Maintenance of gasoline-powered equipment:

Regular maintenance and tips:

- Recommend that ethanol-free gas be used in all gas-powered equipment
- 2-stroke engines run on a mixture of gas and 2-stroke oil. Caution must be taken to ensure this equipment does not run without the gas/oil mixture as straight gas would harm the engine. Consider tagging equipment that needs gas/oil combo.
- Store gas and gas/oil pre-mix in well-marked containers
- Check oil before every use (applies to 4-stroke engines only)*
- Check for loose bolts and screws (e.g., handles, wheels, motor mounts)
- Clean under deck of mower
- Clean dirt off tines of rototiller

Year-End Winterization:

- Remove as much gas as possible from all equipment, and then run the engine until it's out of gas. You can use a syphon or a baster to initially remove gasoline.
- Drain oil and refill with new oil (applies to 4-stroke engines only)*
- Change air filter
- Change spark plug
- Lubricate cylinders, which involves first removing the spark plug, spraying a fogging oil into the spark plug hole, and then pulling the starting cord several times (one brand of fogging oil is Sta-bil)
- Inspect engine for signs of oil leakage
- For mowers, remove blade, check for a bent blade (not salvageable) and sharpen (see below for sharpening services)
- If applicable check for wear on drive belts
- Clean dirt off tines of rototiller

***Note regarding oil checking/changes:** The procedure for Briggs & Stratton and Tecumseh engines is different from Honda engines. The former two require screwing the wiped dipsticks back into the engine block before removing to evaluate the oil level. Honda engines require placing the dipstick on the top of the threads and then removing to evaluate. Add oil as indicated and retest the level. Never fill completely to top of fill hole. It could ruin the engine or more likely the carburetor. Of note, small engines hold very little oil (approximately 20 ounces). Therefore, running your mower on low oil can damage the engine.

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WARNING: When tipping any equipment with a 4-stroke engine on its side, always be sure to have the carburetor oriented on the top side. If you are unsure where the carburetor is, look for the air filter which will be on the same side. Failure to do this can contaminate your carburetor and/or air filter with oil requiring a time-consuming cleaning or overhaul.

Sharpening Services:

Ace Hardware Center
1398 Williamson St, Madison, WI 53703
(608) 257-1630
Other hardware stores likely will have this service

Wisconsin Cutlery
Shorewood Shopping Center, 3236 B University Ave., Madison, WI, 53705
608-204-0560

Repair of gasoline-powered equipment:

Simple Repairs:

- If engine doesn't start, remove spark plug and check the electrode end for carbon build up or oil deposit. Attempt cleaning with brake cleaner or carburetor cleaner and some light sandpaper. If that doesn't work, buy a new one.
- Replace the pull cord used to start motor (recoil cord)
- Simple repairs could be done by someone without extensive small engine repair knowledge. Ask your gardeners if anyone has experience with small engines or other types of engine repair, such as automotive.
- YouTube is a great resource for "how-to" videos
- Search internet for electronic versions of manuals
- Search internet for repair help/information on discussion boards

More complicated repairs:

TCO Power Center
717 Atlas Ave, Madison, WI 53714
(608) 222-9166

Middleton Power Center
3230 Parmenter St, Middleton, WI 53562
(608) 836-2002

Prairie Power Center
666 S Thompson Rd, Sun Prairie, WI 53590
(608) 318-4350

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Small Engine Non-credit Course through Madison College:

If you have gardeners who are interested in learning to maintain and repair gasoline-powered small engines, Madison College (MATC) offers a 10-week, non-credit Small Engine Repair course. The class takes place in the fall (starting in September) and in the winter/spring (starting in January). Class is held at Middleton High School on Monday nights from 6:30 to 9:30 and runs for 10 weeks. Note: This class is fills quickly. The best way to get into the class is to subscribe to the Continuing Education email list to get the most up-to-date information and notifications on when enrollment for the course opens. Go to <https://madisoncollege.edu/noncredit-courses> and click on [Subscribe to the Continuing Education email list](#) in the 'GET THE LATEST NEWS' box. For additional information, contact the School of Professional and Continuing Education at (608) 258-2301 or (855) 473-2301 option 2.

Battery-Powered Equipment

- Lawn mower
- Weed trimmers/weed whackers/string trimmers
- Chainsaw

In general, battery-powered equipment is more expensive than gas-powered equipment, but there are benefits over gas-powered equipment such as:

Pros:

- Non-polluting
- Easier to maintain
- Quieter
- Cool factor

Cons:

- Initial Cost (Ryobi's are less expensive, \$199 for a 16" deck, versus EGO, \$325-\$500 depending on model)
- Likely need to purchase a new one as the used market is limited
- Batteries expensive to replace
- Need an electrical source to charge batteries for extended use situations (e.g. work days)
- Need to be more careful operating in rainy situations (battery contacts need to stay dry, especially when swapping batteries)
- Can be heavier, especially trimmers, due to size of batteries (different size batteries available)

Where to purchase battery-powered equipment:

- EGO (available locally at Home Depot, online through Amazon)
- Ryobi (available locally at Home Depot, online through Amazon)
- Black & Decker (widely available)
- Greenworks (widely available)

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Maintenance of battery-powered equipment:

Regular Maintenance and Tips:

- Clean deck of mowers. Grass build up can shorten battery run time.
- Trimmer string replacement is similar to gas-powered string replacement
- Check for loose bolts and screws (e.g., handles, wheels)
- Store batteries and chargers in a secured location between uses (they are expensive to replace)
- Consider locking equipment or store in a secured shed
- Sharpen chainsaw chain as needed

Year-End Maintenance:

- Store batteries out of cold over winter months
- Thoroughly clean of mower housing, including under deck
- For mowers, remove blades at end of year, check for a bent blade (not salvageable) and sharpen

Repair of battery-powered equipment:

There is very little if anything you can repair yourself on this equipment. Take advantage of your warranty and consider purchasing an extended warranty. Here are a couple things to check if you are having problems:

- Cutting height too low: If the mower stopped and you were cutting through thick grass, raise the cutting height and try again. Engines sometimes cut out if they can't get through the grass.
- Vents Clogged: This is probably the most common issue that arises when you need to fix a battery-powered lawn mower. Remove the cover of your mower and clean it by hand, just being sure to get out all the gunk that's accumulated. If you can't remove the cover, then you can use compressed air to blow out the vents as well. The reason that having your mower's vents clogged stops the entire machine from working is because without the vents air cannot reach the mower's engine. This causes your machine's engine to overheat and to possibly even blow out.
- Battery Contacts: It's important to not only remember to keep your battery charged, but to also keep the connection between it and the engine clean. If your electric mower's engine isn't working at all, then you might want to make sure that the outlet that connects the battery to the engine isn't mucky or grimy. If it is, then cleaning all the dirt and grime out might very well bring your mower back to life.

Equipment and Gasoline Storage

Sheds:

- If you need a garden shed, consider purchasing one from the MATC Construction and Remodeling program. For more information visit: <https://madisoncollege.edu/cottage-shed-purchasing> or contact Jen Voichick (jvoichick1@madisoncollege.edu or 608-246-5213).

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- Shed kits are available at big box stores such as Menard's, Home Depot, Lowe's.
- Considering building a ramp up to the level of the floor of your shed. This makes it much easier to roll mowers and rototillers in and out.
- Get a shed with a skylight, or if you have electricity, include lighting in your shed
- If theft is a problem, be sure to lock your shed or secure valuable equipment inside
- Get tool hangers to use for tools in shed; available at big box stores
- If locking valuable equipment, heavy duty chain and locks can be purchased at Farm & Fleet, 2202 South Stoughton Road, Madison, WI 53716, (608) 221-3851.

Gasoline Storage:

- Avoid storing gas at your garden, but if you do have to store small amounts there, be sure to store in a locked location.
- Store gas in containers of 5 gallons or less that have been approved for gasoline.
- Do not fill containers completely to allow for expansion in warmer months, particularly if you are storing them in a shed or standalone storage cabinet.
- It is best to store gas at room temperature. Avoid storing in locations with widely fluctuating temps.
- Store at least 50 ft. away from pilot lights and ignition sources such as the heat, sparks and flames from a water heater, space heater or furnace.
- If storing on concrete floors, place a piece of plywood under the container to contain small spills.
- Do not store gas for over a year and less time if it is located in a warm environment.

More detailed information can be found on these two web pages, including information about storage cabinets (second link).

- <http://www.yourepair.com/746/howto-proper-storage-of-gasoline-for-lawnmowers-power-tools.html>
- <http://www.safety1industries.com/product-reviews-blog/how-to-store-gasoline-safely>

Hoses

- Consider purchasing hoses made by the DRAMM Corporation. They are widely available at local garden centers, hardware stores and online. They are pricey but hold up well in the community garden environment.

Dramm Corporation
2000 North 18th Street
Manitowoc, WI 54221
920-684-0227
<https://rainwand.com/>

- Drain hoses for winter storage, coil up and store under tarps to keep sunlight, snow and ice off them.