The magazine of modern homesteading

COUNTRYSIDE

& Small Stock Journal

Machinery on the Homestead e-edition

Machinery on the Homestead

Get the Most Out of Your ATV

Buying a Chainsaw

Maintain Your Farm Tractor

Plus
Best Tractor Tires for the Farm

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ANN TOM
Editor,
Countryside

When I was growing up, Saturday mornings in the fall meant getting up early and heading to the woods with my family to bring home loads of wood for winter. I was always fascinated when watching my dad run his chainsaw. I thought it was the neatest thing and couldn't wait to grow up and get one of my own.

Recently that day arrived and I learned there's more to buying a chainsaw than just going to the store and throwing one in the cart. In this e-edition, Ben Hoffman explains how to select the right chainsaw to fit your needs, along with safety gear and operating tips.

Also included are articles on welding basics, ATV implements, farm tractor maintenance, and more! We hope you find this edition a valuable resource and refer to it time and time again.

Enjoy!

Editor, *Countryside*

Our Philosophy

At *Countryside*, our purpose is to inspire self-reliant living on any level.

We acknowledge that the path to self-sufficiency is as unique as the person who accepts the journey.

We strive to strengthen the homesteading movement by sharing the diverse voices and knowledge of today's practioners.

We teach our readers how to grow and raise their own food; build, fix and craft with their own two hands; and walk as gently on this planet as possible.

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Buying a Chainsaw

The 52cc Husky with 16-inch bar can handle trees up to 34 inches in diameter at the stump. The 32cc Jonsereds is for limbing and just in case I get the Husky bound in a cut. (I also carry a sharp axe in case both get bound.) The Jonsereds' narrow kerf is fine for carpentry work. My wife claims I measure it with a micrometer, mark it with a crayon, then cut it with a chainsaw.

BY
BEN HOFFMAN

BUYING A CHAINSAW CAN BE a frustrating experience. What brand should I buy? What size bar should I get? How many horsepower? And the list goes on, depending on your purpose in buying it in the first place. Are you just going to limb some trees in the orchard, or do you plan to cut firewood? Are you going into the woods and cut trees down, or buy tree-length wood from a logger?

First and foremost, buy from a saw shop that services what it sells, preferably one that deals with loggers. This may be difficult as increased mechanization in the woods has reduced chainsaw use, sales have declined, and many saw shops have gone out of business. But shops that deal with professional loggers can answer most of your questions and most importantly, service what they sell. If you buy online, or from a big box store, the service ends when your credit card is swiped.

There are many different makes and models, but I stick with the major brands — Stihl and Husqvarna — principally because they are popular with loggers, hence there are more dealers offering service as well as sales. There are other excellent saws on the market, and if there is a dealer who provides service, go for it. I had a Husky 44 for 30 years and could always get parts and service. With a 12-inch bar, I safely cut and limbed a 22-inch elm tree. My very favorite saw was a 56 cc Stihl with a 14-inch bar, big enough to safely fall and limb a 30-inch white pine tree.

A year ago, my first excursion into "homeowner" models was a 32 cc Jonsereds with a 14-inch bar. It easily handled a 22-inch ash and is my backup in case my 52 cc Husky gets pinched. If you need a saw for occasional cutting, this saw is fine, but it is not designed for cutting several cords of firewood. My experience has been that the bars and chains do not stand up to cutting hardwoods such as oak, rock maple and ash. If you need a saw for more than occasional work, expect to pay $300-350 minimum. If you are cutting oak, beech ash or hickory, get at least a 52 cc model. For softwood — pine, spruce, fir, and cedar — 44 cc is fine.

BAR LENGTH?

The longer the bar, the more risk of accidents and the greater the likelihood of striking rocks. When I was a logging contractor, I bought a saw with a 21-inch bar but two weeks later switched to an 18-incher. You can cut a tree with a diameter of 2.2 times twice the length of the bar, so why get a long bar? Unfortunately, most current ads for saws feature bar length. Years ago, listening to my tirade about people using long bars, my wife suggested that bar length might somehow be subconsciously equated with manhood. If you are cutting the tree down in the woods, consider the work involved. Based on time studies, sawing time to fell a tree is about 15 percent of total work time but removing limbs may take from 35 percent (hardwoods) to 55 percent (softwoods). So a smaller, lighter saw is desirable. A 16-inch bar should be adequate for most non-pros; if a good quality 14 were available, that would be my choice. The shorter the bar, the safer and more efficient the saw, and the

Minimum safety gear includes a helmet with ear and face protection, safety chaps with Kevlar pads from ankle to waist, steel-toed boots, and gripper gloves. A bright colored shirt is an added safety feature in the woods.

A cheap chain grinder from Harbor Freight makes up for poor filing.

Chainsaws are dangerous tools & can cause serious accidents, so safety and safety clothing are of paramount importance. Do not use a chainsaw unless you have, at a minimum, a safety helmet with face and ear protection (take it from one with stitch marks in his scalp,) plus safety pants or chaps.

less weight you drag around. One of my first saws weighed 35 pounds — many modern saws run 10 to 12 pounds.

KEEPING IT SHARP

Regardless of what you get, like any cutting tool, the sharper the saw, the better it performs. Having filed saws for years, I have no problem keeping the chain sharp. But when I was logging, I took my saw to the dealer every Friday and sharpened the chain on his machine. That assured that all teeth were the same height, depth, and sharpness, at least on Monday. If teeth are not uniform, you might cut in circles. I still use a file in the woods but bought a cheap chain grinder from Harbor Freight. You'd be surprised at how many new friends I have. But best of all, my woodcutting is much more efficient; the chips coming from my chain resemble ribbons, not fine sawdust, and the motor isn't screaming. For a novice filer, file guides take the guesswork out of sharpening chains.

SAFETY

Chainsaws are dangerous tools and can cause serious accidents, so safety and safety clothing are of paramount importance. Do not use a chainsaw unless you have, at a minimum, a safety helmet with face and ear protection (take it from one with stitch marks in his scalp), plus safety pants or chaps. My 33-year-old chaps (no cuts!) wrap around the legs and zip — no laces or straps to catch in the brush. I keep duct taping the tired fabric because my new chaps have straps which snag on brush. Last winter I bought safety pants — waterproof nylon, insulated, with sleeves inside the legs to hold Kevlar safety pads. Much more fun in the snow and no snagging. Never launder Kevlar pads as that will re-orient the fabric, so I slip the pads out and launder the pants. Check out Labonville.com.

You can also buy safety boots with Kevlar protection and steel toes. Nothing like dropping a log on your foot without steel toes. And non-slip gloves are important when handling a saw. Safety equipment is not cheap, but it beats the heck out of the emergency room. You will also need a couple of wedges, files, bar and chain oil, 2-cycle engine oil to mix with the gas, and a one or two gallon gas can for fuel. Most modern saws use a 50-to-1 ratio of gas to oil and make little smoke. Older saws used more oil and created a great cloud of smoke that kept the black flies, skeeters, and no-see-ums away.

SUMMARY

So, if you're going to buy a chainsaw for cutting firewood, expect to pay a minimum of $500 for saw, chaps, helmet, and accessories. With regular cleaning and maintenance, using sharp chains, a modern saw can last 30 years or more. My 1973 Stihl 031 is still running, but it lacks the safety features of newer saws. Gloves and boots should already be in your wardrobe if you spend any time in the woods. If you buy from a reputable dealer, a used, reconditioned saw is a good way to cut your initial expense and he'll treat you well when you trade up for a new saw.

To summarize — purchase a 45 cc to 55 cc displacement with a 16-inch bar and chain. If you only cut up long lengths of purchased wood, more horsepower is fine, but stick to a short bar.

HOW TO USE AN

OXY-ACETYLENE TORCH

By Jeremy Chartier

The oxy-acetylene torch is one tool I can't live without. Working on old trucks and farm implements alike, you're bound to find yourself in need of a heat source above and beyond what a propane torch can offer. The solution to your problem can be found in the oxy-acetylene torch.

WHAT IS OXY-ACETYLENE?

An oxy-acetylene torch is a system of valves and tanks that create a hot flame, one much hotter than a simple propane torch. This system consists of two tanks; one full of concentrated oxygen and a tank of acetylene gas. Acetylene gas is flammable, but will not reach temperatures hot enough to turn metal into molten material alone, so oxygen is added as an oxidizer to intensify the heat of the resulting flame.

WHAT IT CAN DO

Oxy-acetylene torches are versatile, and in many opinions, an indispensable part of the tools we use on the homestead. The primary use of an oxy-acetylene torch set is to cut metal. It does this well, but it also lets us superheat rusty bolts and parts that can't be freed with a good old dose of torque.

GAS WELDING

If you have a full complement of torch tips, you can also weld with an oxy-acetylene torch. Brazing, or gas welding, is an excellent skill to have, and in some situations, works the best compared to ARC, TIG, or MIG welding. That being said, I seldom use that feature of my torch set.

WHAT IT'S NOT SO GOOD AT DOING

Oxy-acetylene sets are not simple, nor are they exceptionally portable. There are small kits and tank caddies available that hold plumber's B-sized tanks, but these tanks don't last long when cutting metal. These plumber's sets are meant for lower temperature torch tips for brazing (or "sweating") copper pipes. These kits work well for that, but because the small tanks burn out so fast, they don't usually make it onto many people's farm tools list.

WHAT SIZE TO BUY

Like I've said, the B-size tanks don't suit our needs very well, despite how easy they are to find in tool stores. This is a "bigger is better" situation, so consider getting a taller tank such as a K-size oxygen and a #4 acetylene tank. If you can afford to, I suggest buying two of each, so you can swap out and keep working instead of putting the project on hold until you can get to the dealer for a refill.

BUY OR LEASE?

Be aware that some gas dealers will try to sell you on leased cylinders. If you're a busy automotive shop or fabrication facility, this typically works out in your favor. For those of us who use our oxy-acetylene sets sparingly, be forewarned; you want to buy your tanks outright. Unless you want to pay a perpetual lease agreement for something that you use a few times a year, I highly suggest you find a dealer that will sell you the tank outright.

OWNER TANKS

Once you buy a tank and deplete it, you have two options at most gas dealers; wait a week for them to fill it, or trade them for an already loaded tank. I've always swapped out for a full tank, just understand that the cylinder you'll receive in return is not as new and not as clean as your brand new tank. Most gas dealers call these owner tanks, so be sure you mention that when you go to exchange them.

SAFETY FIRST

There are laws about how you transport pressurized vessels that you should know. All tanks that feature that classic-necked design you've likely seen before, require a screw-on safety cap when in transit. Don't show up to a gas dealer without one because they get very cranky if you don't have one.

Never transport pressurized gas cylinders in the trunk of a car! I know people do it all the time with propane tanks, but it's not legal and not safe. Cylinders should be transported standing up in the bed of a truck and fully secured. That is the preferred method of transportation and the safest. The last thing you want is to have a tank slide around in your truck, have it impact the neck of the cylinder and turn it into a deadly rocket.

Good kits are expensive but worth the investment. I prefer to buy quality gear at my local welding shop instead of a corporate big box store.

This torch set has served me well through the years. We prefer larger tanks on the farm, so we use K size oxygen (blue) and #4 acetylene (red) cylinders.

TORCH KITS

Torch kits are available in many tool and farm stores, but the best parts and kits you can find are found at your local welding supply shop. An oxy-acetylene torch is a tool you should buy once if you buy the right one. Buying the cheapest kit seldom ends well for the end user, and replacement parts may be non-standard. Be sure to consult your local welding shop for their recommendation, and be prepared to pay a little more for quality.

PARTS OF A KIT

A full oxy-acetylene torch set should include two regulators, four pressure gauges, a length of double line hose, blowback valves, a torch body, and several torch tips. Each regulator gets two gauges; one to tell you how much pressure is in the tank, and how much pressure you're allowing to go up the hose and to the torch body. The torch body is where the gas mixing happens, where the high flow trigger for the oxygen is, and where the mix control knobs are. On top of the body is where you screw on your desired torch head.

MOVING IT ALL

These tanks are heavy, and so is the oxy-acetylene kit. There are caddies available, but a sturdy hand truck and a ratchet strap also work well. Be sure they are secured well!

A Guide to Welding Basics — From the Tools to Their Uses

BY JEREMY CHARTIER

THERE ARE MANY WELDING TYPES available today, but for the beginning welder, there are three kinds you should consider. They all have their place, their good points, and their downfalls. When choosing a welder, there are three components you should consider: the power supply, how it shields the weld and how it fills the weld. These three factors will largely dictate which welding types you decide to buy into.

POWER SUPPLY

You need to create heat to bond your metal surfaces together, otherwise, you're just gluing. Heat in these welding types are supplied by electricity, so the first major component is the power supply. Things to consider are duty time (how long you can weld), the input voltage (110v or 220v), output amperage (will it go high or low enough) and cost.

SHIELDING

Your welding arc needs to be protected from ambient air, otherwise, it will splatter. Some systems burn flux to shield the arc and others use a bottle of shielding gas. Both systems have pros and cons.

FILLER

Filler metal fills the cavity you make when welding. Depending on the system, it might be a consumable electrode or automatically fed wire.

HOW TO ARC WELD

SMAW (Shielded Metal Arc Welding) welders have been making sparks for generations, and they still work perfectly fine. A SMAW "stick" or "Arc" welder is a simple yet effective welding system.

The power supply of an Arc welder is typically referred to as a "tombstone" due to its headstone shape. Stick welders have a selectable amperage adjustment and an on/off switch, so they're not very confusing. Attached to the power supply there are two welding cables, one ground clamp and one electrode holder colored black and red respectively.

Arc welder electrodes are a consumable conductor, filler material and shielding all in one stick. Be sure to stock up.

Filler metal and Arc shielding are both taken care of by the welding electrode. An Arc welding electrode is a length of thick steel wire with a special coating on the outside,

resembling a stick (hence the name). This electrode has a bare metal end which inserts or clamps into the electrode holder and conducts the electricity to the tip. When an Arc is struck, the steel inner core melts to fill the weld and the outside coating burns to create a gas pocket and a layer of material called "slag" that shields the welding pool from the environment. This electrode is a consumable part and doesn't last long.

The big plus of an Arc welder is cost. These are readily available and can be found for very little at yard sales and online. The downside is the cleanup. The protective slag must be chipped off to expose the actual weld beneath, adding a time-consuming step. Additionally, more technique and practice is required to become proficient with an Arc welder compared to its modern counterparts. That being said, it's regarded as the best welding type for beginners.

HOW TO MIG WELD

MIG (Metal Inert Gas) welding is a very popular welding system. Its ease of use and the professional look of the resulting weld make this an attractive welding type for home, farm and professional users alike. Coincidentally, this is the system I used to weld chain hooks on my tractor last year.

MIG welder power supplies usually consist of a box cabinet, accompanied by at least one gas bottle. Controls on the front typically include an amperage adjustment, wire speed, an on/off switch and sometimes an AC (Alternating current) or DC (Direct Current) selector. Also, there is a valve on the bottle to control gas pressure.

This MIG welder, albeit expensive, allows me to weld thick and thin steel, as well as aluminum.

TOP: Arc welder electrodes are a consumable conductor, filler material and shielding all in one stick. Be sure to stock up.

Much like the Arc welder, a MIG unit will have two cables, one for ground and one that resembles a hose with a nozzle and trigger. This curious looking hose is actually four things in one; a welding cable, electrode, gas line and filler wire feed.

The filler material is stored as a spool of wire inside the cabinet and is fed through the nozzle. As you depress the trigger, the Arc begins and the welder feeds wire into the arc to fill the weld. Gas is delivered from the bottle to the nozzle every time you hit the trigger. This gas pocket shields the weld and leaves you with a clean weld that shouldn't require cleaning.

MIG welding is easy, but it's not cheap. Good power supplies that offer enough amperage to weld thick metal are expensive and the inert gas (usually Argon) that is required adds expense and inconvenience. Gas bottles are expensive and unless you buy two, you'll have to stop welding and run to the closest fill station to refill them.

HOW TO FLUX CORE WELD

FCAW (Flux Cored Arc Welding) is the more common of the welding types because it combines the simplicity of Arc welding with MIG's ease of use. It's biggest selling point, however, is its low cost.

Flux core power supplies look like MIG welders, only minus

WELDING TYPE	COST	LEARNING CURVE	CONVENIENCE	CLEANUP	STEEL (SHEET)	EXHAUST PIPE	STEEL (1/4")	STEEL (1/2")	STEEL (3/4"+)
Arc (SMAW)	$	High	Better	Worst	No	No	Great	Great	Great
MIG	$$$	Medium	Good	Best	Great	Great	Great	Good	OK
Flux Core (FCAW)	$$	Low	Best	Better	Good	Good	Great	Good	OK

the gas bottle. It still features the same clamp and hose that the MIG uses, as well as the same controls on the front.

The big difference between Flux core and MIG welding is the welding wire. Flux cored wire is actually a tube filled with flux. Much like the Arc welder, this flux material burns to create a gas and slag to protect the weld from the environment. In a pinch, you can turn a MIG into a flux core welder by shutting off the gas and changing to a flux cored wire.

This welding type can be smokey and dirty, requiring good ventilation. When you're done, you'll want to wire brush your work to clean off soot and slag. FCAW rarely makes good-looking welds, but you can still build things like compact tractor implements using this welding type.

THE BEST WELDING TYPES

It's hard to say which is best, because it really depends on you. Do you want to weld sheet metal? Then you want a MIG or Flux Core. Are you welding a half-inch plate steel? Your best bet will be an Arc welder. Is money not an issue? Dive in with a top-notch MIG welder because you can't go wrong there.

TIPS FOR THE BEGINNER WELDER

A beginner welder has a lot to learn, but don't let it intimidate you by any means. Welding is a useful skill that can save you lots of money and could even open up employment options you wouldn't have had before. I've been welding on the farm for the better part of 20 years and I've learned a few things along the way. Let me share a few key pointers to get you started.

SAFETY FIRST

Just like wearing chainsaw safety gear to cut down trees, you need appropriate safety gear to do a welding project. Every beginner welder should buy themselves some basic safety gear before they ever turn on a welder.

Welding is a useful skill that can save you lots of money and could even open up employment options you wouldn't have had before.

There are cheaper alternatives, but a good auto-darkening welding helmet is best.

TOP: Arc welders, although harder to learn, are the best way to start welding. Much like starting to drive using a standard shift, once you can "stick" weld, other weld types are that much easier to conquer.

EYE PROTECTION

Before the obvious stuff, invest in a hand full of cost-effective safety glasses. I buy cheap safety glasses and change them regularly, usually every other job just because they get scratched up. Seeing well is critical to surface prep and since welding is 90 percent prep and 10 percent Arc time, you'd best have glasses you don't hate.

Welding helmets are not all created equal. Whatever welding shield you decide to buy, be sure it covers your entire face and is auto darkening. An auto-darkening shield allows you to keep your face covered while you work and when you strike your Arc, it will automatically tint your viewing window. I can't stress enough how much safer and convenient this shield design is over others. You can find these auto-darkening shields for around $40 or less at your local discount tool shop or online.

EAR PROTECTION

Don't underestimate the sound of a metal grinder. You may be able to tune it out now, but you will pay for it later. I suggest using disposable ear plugs since ear muffs tend to be far too bulky when using a welding face shield.

SKIN PROTECTION

I have a lovely scar that runs across my wrist. Albeit well-faded by now, the lesson still stands in my mind. Your regular leather gloves just don't offer you the protection you think they do, so buy some quality long cuff welding gloves. Cheap stiff gloves are inconvenient at best, so spend a little more on quality gloves to keep your skin intact.

A welding Arc is incredibly bright and it can fry your skin faster than that time you fell asleep

at the beach. Arc burn is seriously painful, which is why welders wear long sleeves and long pants no matter the weather. Follow their lead and cover your skin with non-flammable clothing.

Welder's coats can be had for around $15 or less and they're cheap insurance. I forgot to wear mine when I was welding some tractor bucket attachments last year and I suffered for two weeks with a terrible Arc burn. Learn from my mistakes.

DUTY CYCLE

Duty cycle is expressed as a percentage (such as 20, 40, or 100) and refers to how much of a 10-minute period it can weld before it needs a break. For example, a 20 percent duty cycle welder can weld for two minutes, then must rest for eight minutes. If you try to weld beyond your duty cycle, your welder and welds will suffer. Your duty cycle will largely depend on your welding types and the quality of your machine.

PREP WORK

The most common downfall of a beginner welder is underestimating the importance of prep work. You need to prep your working surfaces before you weld anything. Rust, paint, grease, oil, and any other contaminant will sabotage your best efforts if not completely removed.

A grinder is a welder's best friend. If you need to shape or clean rusted steel, a grinding wheel will take metal off fast and bevel your edges. If you have paint or light rust on your surface, install a wire wheel. Need to cut things short? Grab a cutting wheel. The grinder really is the unsung hero of the welding world.

Once you have a surface you've ground to bright steel, you'll need to clean it. Use Acetone to clean the surface of oils and grease, since a contaminated surface makes for terrible welds. Do not use brake cleaner, since burning brake cleaner produces a dangerous gas.

SET UP

Make sure your work is ready to weld and fully supported. You don't want to be holding on to your work while you weld, so use magnets, welding tables, and tack welds to keep your work in position. Tack welds are small spots of weld meant to temporarily hold things in place and should be easily broken or ground off. When using a MIG or Flux Core welder, a quick one-second zap should produce a good tack weld.

BEGINNER WELDER

Whenever possible, give yourself a support to rest your arm while you weld. Without some form of support, your Arc will shake or wander as you fatigue.

Avoid warping by tack welding and clamping. If laying a lot of weld (such as the length of your tractor's bucket), weld in short bursts, then move to a different area or side of the work. Doing this prevents putting too much heat in one spot.

For sheet metal, use brief tack welds. If you try to run a weld bead on sheet metal it will warp or burn right through. It's tedious, but you should tack sheet steel zap by zap.

PRACTICE MAKES PERFECT

Welding is a motor skill and a mental ability. Your body needs to develop muscle memory and learn the hand-eye coordination to make proper welds, which doesn't happen overnight. Learn about what you're doing. Read a book, surf online or find a great blog on welding. There are lots of talented welders willing to share their experience and it's up to you to listen. Be open, be wise and above all, be safe!

Getting the Most Out of Your ATV

By Dennis Evers

ATVs are great. They work in all kinds of weather, are great for chores, and are quite fuel efficient. While many people think of them only as transportation, with the right attachments they could become the most versatile piece of equipment you own. The list of ATV accessories and attachments is a long one, with hunting and recreational accessories by the hundreds. For working purposes, we'll cover the most popular tools you might use around the homestead.

If you are shopping and the "implement" looks like it would break the first time you use it, keep looking. There are plenty of high-quality, affordable implements and accessories available for your ATV that are made here in the good old USA. It's always better to spend a little more and have a lifetime tool. In the same vein, there are quality implements and there are worthless gadgets. If you are in doubt,

Mowers come in various widths.

Aerators are also available.

A trailer is probably the handiest of all implements.

do some research and ask around. Don't be afraid to ask the salesperson if you can return it if you are dissatisfied. If it works as touted, you won't want to part with it. I find that the tractor supply and ag stores tend to be pretty straight forward when you ask questions. If you can, go online and research the particular model you are interested in. If it has problems, there will be feedback. Some attachments require a minimum horsepower or CC to properly use, so make sure your ATV has enough power for the job.

Remember to read all instructions and like any other piece of equipment, use recommended safety gear and be careful. A full trailer can weigh thousands of pounds. Plows, rakes, harrows, and all implements need to be properly installed, maintained and used. Now let's see what there is out there that can help us with our summer chores.

Trailers: On my list, they are an absolute necessity. Trailers basically give you the ability to haul large loads of dirt, manure, rocks, firewood, grass cuttings, and more. Don't overdo it though, and make sure your rig will handle the weight. If you want to haul heavy loads and your ATV can handle it, consider a tandem trailer. With four wheels they are more stable and have a bigger capacity. There is a huge assortment of trailers available in metal and poly, so take some time and figure what would be the best all round application for your needs. If your homestead is pretty well-developed and you are just into maintenance, a simple two-wheeled poly or metal trailer should be fine. Don't forget to make sure the trailer has a dump feature, which really helps with the unloading end of the operation.

Lawn implements: Where does one start? There are dozens and dozens of implements for lawn and pasture care. Lawn mowers and brush cutters are great if you have a lot of area to cut or super-dense groundcover to mow. There are dozens of brush cutters and finish mowers available for ATVs. Most of them are tow behind, but there are push mowers that attach to the front to allow you to see exactly what you are cutting as well as mowers that mount between the wheels. ATVs can go many places many lawn mowers can't. Make sure you get a big enough mower for the job.

Aerators: Designed to either cut or poke holes in the lawn or pasture to allow fertilizer, air, water, and nutrients in, aerators come in a plug style and a spike style. The plug aerator has long hollow tubes that actually leave holes in the soil for maximum penetration. The spike aerators simply cut a slit in the soil and work well in loamy soils and black dirt. The plug aerators leave thousands of small plugs on the lawn, which eventually break down with mowing.

Working up the garden is a piece of cake with a disc harrow and chisel plow.

Don't be afraid to ask the salesperson if you can return it if you are dissatisfied. If it works as touted, you won't want to part with it. I find that the tractor supply and ag stores tend to be pretty straight forward when you ask questions. If you can, go online and research the particular model you are interested in. If it has problems, there will be feedback.

Harrows: Tine or drag harrows are designed to break up tough, compacted ground to prepare it for planting or smoothing rough areas. They can also help cover seed beds, spread fertilizer, dethatch pastures and lawns (root raking), and perform a host of other chores. There are implements specifically made for dethatching only, but a tine harrow is many implements in one.

Disc harrow: When you need to aggressively prep some soil, a disc harrow cuts and breaks up even the hardest ground. Designed for preparing seed beds and game plots, cultivating soil and turning dead foliage in, a disc harrow is a serious piece of equipment for some penetrating dirt work.

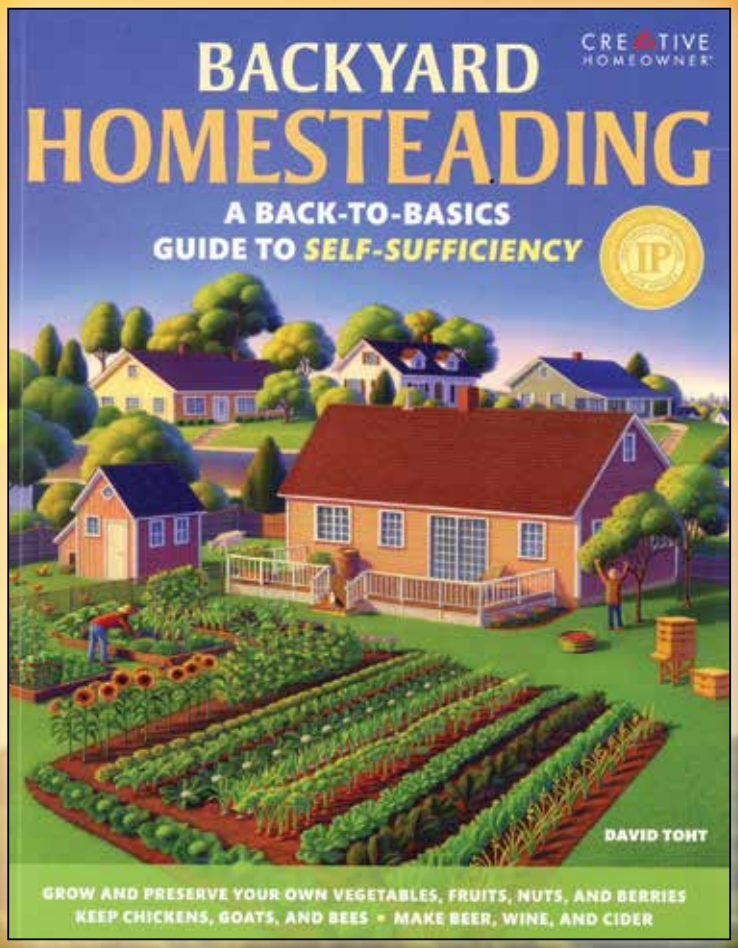
Another device designed to scarify or prep soil is a chisel plow. Many companies offer tools that work together, for example a chisel plow with a blade attached behind it to level the newly tilled ground.

Plows: The two common types of push plows are for snow and dirt. Dirt plows are close to horizontal to the ground so they don't dig in. A snowplow on the other hand, has a pronounced "rake" to scrape down to the earth and lift the snow. When properly set up, snowplows can do an amazing amount of work. Some snowplows require a winch on the ATV to lift and lower the plow, and others use a linear motor to raise and lower the blade.

There are many other types, styles, and combination of attachments available from dozens of quality manufacturers including buckets, tillers, snow blowers, sprayers, dry spreaders, and more. Do your homework and make sure the implement is the best choice for the job. Be safe and enjoy the summer.

A Back-To-Basics Guide To Self-Sufficiency

BACKYARD HOMESTEADING



Backyard Homesteading addresses the needs of many people who want to take control of the food they eat and the products they use—even if they live in an urban or suburban house on a typical-size lot. It shows homeowners how to turn their yard into a productive and wholesome "homestead" that allows them to grow their own fruits and vegetables, and raise farm animals, including chickens and goats. *Backyard Homesteading* covers the laws and regulations of raising livestock in populated areas and demonstrates to readers how to use and preserve the bounty they produce.

To order visit:
CountrysideNetwork.com/shop/backyard-homesteading
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How to Maintain a Farm Tractor

Avoid Unnecessary Tractor Repairs with Proper Maintenance

By Jeremy Chartier

USING A TRACTOR MAINTENANCE CHECKLIST is a great way to keep your small farm tractor operating smoothly. For many of us, we've come to rely on our tractor, and being without it is a great inconvenience. We'd all like to avoid losing the use of our tractor, and we can do so by following a basic tractor maintenance checklist.

TRACTOR MAINTENANCE CHECKLIST

Your tractor uses several consumable products to operate, and they certainly don't last forever. Besides fuel, we have different oils, grease points, filters, and rubber products. All these things have a service life we need to observe because if we forget or ignore them, they're guaranteed to break at the least convenient time.

✔ AIR FILTERS

The air filter on your tractor's engine stops dirt and dust particles from destroying your engine from the inside out. Tractors mow and till fields, as well as grade driveways and move materials like dirt, sand, gravel, and manure. These jobs can kick up a lot of dust, so don't be surprised if your air filter clogs up quickly.

Periodically inspect your air filter, or your filter's air restriction gauge if it has one. Can you see daylight through your air filter, or is it so loaded with dirt that you can't see any light through the filter medium? Is your tractor smoking more than usual? Does your tractor starve out or noticeably loose power? These are all cues to change your air filter.

✔ FUEL FILTERS

Fuel filters, much like air filters, stop contaminants from your tractor's fuel from destroying your engine internally. Fuel filters don't last forever, and when they stop flowing fuel, it's because the filter is doing its job.

Many diesel tractors include a water separator in the fuel filter. Water in diesel fuel is a real concern and can do irreparable harm to your engine. Read up on your specific fuel system and understand how to maintain it, because if neglected, it may leave you without a tractor.

✔ HYDRAULIC SYSTEMS

Modern agricultural tractors have built-in hydraulic systems to run implements and bucket loaders. Most of these tractors will feature a filter to capture contaminants in the hydraulic oil as it circulates through your system.

A clogged filter can cause pressure issues, making your bucket loader or hydraulic implements slow down or lose power, so be sure to change them per your manufacturer's recommendation.

✔ COMBINED SYSTEMS

Be aware that many modern tractors share the hydraulic fluid between the transmission and implements, so your hydraulic and transmission oil may be one in the same. Older tractors may feature a stand-alone system you need to check independently.

✔ CHECKING HYDRAULIC OIL

On most modern tractors, there is a sight glass window in the back near the PTO shaft, or there is a dipstick somewhere. Check your hydraulic oil level frequently, because incorrect levels can cause damage and performance problems. It's best to check your fluid level with no rear hydraulic implements attached because they can affect the oil level. Be sure to lower the bucket loader as well. Otherwise, it will throw off your readings.

Write the date or hour meter reading on filters and parts to remind yourself when they were last replaced.


Hydraulic lines are used where your loader hinges. Inspect these hoses for obvious signs of aging.


V Belts and serpentine belts should be flexible. If they crack and split when bent like this, then they're no good.


Sight glasses, like this one near the PTO spline on my John Deere, is a quick way to check your fluid level.

✔ ENGINE OIL

Just like your car or truck, your tractor needs an oil change eventually. Unlike cars and trucks, we're not changing a tractor's engine oil based on mileage, but by operating hours. All tractors should have an hour or "Hobbs" meter on the dash. This meter logs how long your engine has been running. Just like changing the oil on a vehicle, you'll be changing the oil filter on your tractor at the same time.

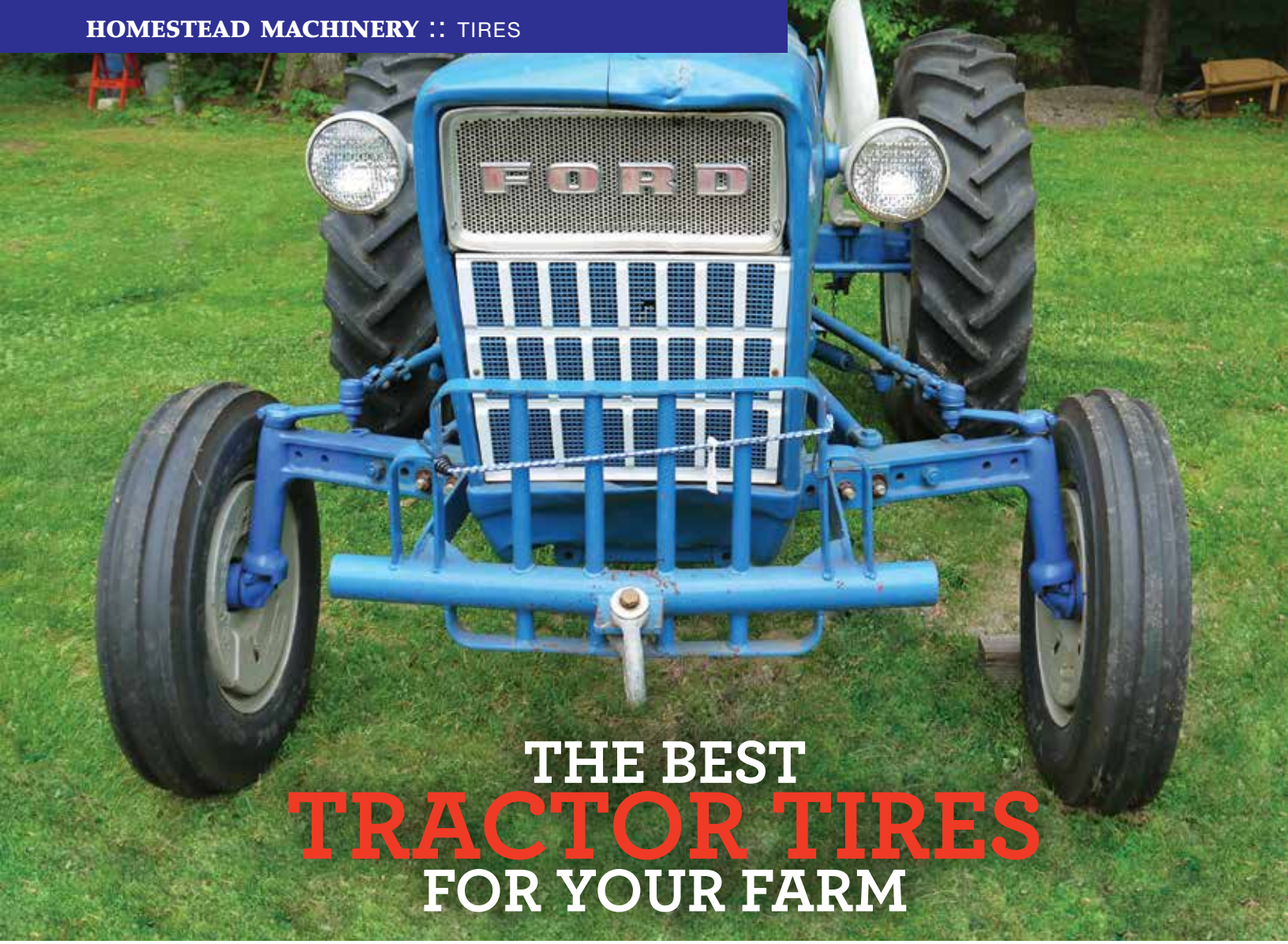
✔ COOLANT

Engine coolant will collect contaminants from wear and tear on the coolant system, and deposits will begin to form over time. An occasional flush and replacement of fluids help avoid internal damage to your coolant system like rust and clogs. Also, when you change your coolant, be sure to replace your thermostat for good measure.

TRACTOR MAINTENANCE CHART*

WHAT TO DO	HOW OFTEN
Check Oil Level	Before Startup
Check Fuel Level	Before Startup
General Walk Around	Before Startup
Check All Fluid Levels	Every 10 Hours
Check Air Filter	Every 10 Hours
Check Fuel Bowl (if equipped)	Every 10 Hours
Grease All Zerk Fittings	Every 10 Hours
Check Wheel Bolts	Every 10 Hours
Change Engine Oil and Filter	Every 200 Hours, or Annually
Check Belts and Hoses	Every 200 Hours, or Annually
Check Hydraulic Lines	Every 200 Hours, or Annually
Replace Air Filter	Every 500 Hours
Replace Fuel Filter	Every 500 Hours
Change Hydraulic/ Trans Oil and Filters	Every 500 Hours
Flush Coolant System	Every 2 Years
Replace Thermostat	Every 2 Years
Fill Coolant System With New Coolant	Every 2 Years

*Basic recommendations. Check your manual for specific maintenance schedules.



THE BEST TRACTOR TIRES FOR YOUR FARM

By Jeremy Chartier

CHOOSING THE BEST TRACTOR TIRES for your small farm tractor can be a make-or-break deal. Not all tractors are the same, and not all tractor jobs call for the same tire or tire size. Knowing which tread will serve you best can be the difference between getting the job done, or making a bigger job than you bargained for. Let's look at common, and some not-so-common, styles available to you.

TYPICAL AGRICULTURAL STYLE

R-1 is the most common style of tractor tire. This is your average agricultural tire that features an aggressive cleat pattern angled at about 23 degrees, radiating from the tire's centerline. R-1 tires perform well in mud, dirt, and fields. It's a compromise between traction performance, wear resistance, and road manners.

Don't think of this as a proper road or hard surface tire, nor is it the best snow tire, but it's a reasonably well-rounded tire fit for general farm use. This is the style I have on my John Deere 5105. Beware of deep sandy surfaces, however. R-1 tires will try to dig a hole to China in soft, sandy conditions. Be gentle and deliberate when driving R-1 shod tractors over turf, since making a turn on grass will obliterate a well-manicured lawn.

AGGRESSIVE AGRICULTURAL TIRES

R-1W (Wet) style treads are just like the original R-1 but with a 25 percent deeper cleat for deep mud or slick clay applications. I don't suggest these unless you plan on operating your tractor in deep mud, manure pits, or plowing fields of wet clay. Road manners are not this tire's forte by any means, and running them on hard surfaces will yield unsatisfactory results. If your tractor spends all day mucking out sloppy, muddy areas, or wallowing in greasy clay dirt, then perhaps this is a good choice, but it's not a good candidate for the vast majority of small farms and homesteads.

ROW CROPPING

R-1HA (High Angle) is yet another variant of the conventional R-1 tire, but instead of having a tread lug set at the traditional 23 degrees, this high angle

variant offers a tread angled at 45 degrees. This style of tire performs well for tractors in row cropping, where you want a tall, skinny tire that fits between the rows of your plants. This is another one of those specialty styles that most small farmers and homesteaders will have no use for.

LET'S GO BOGGING

R-2 is a rare style in North America, but it's nonetheless a variant of the R-1 tire. Unlike the R-1W which is 25 percent deeper than the R-1, the R-2 is twice the depth of the R-1, making this a tire that is entirely unsuitable for 99 percent of us in the United States and Canada. This specialty tire does reign king in rice paddies and bogs, but that's about it. It's doubtful that anyone reading this article has a real need for this style tire unless you bought a farm with a cranberry bog.

GRASS FRIENDLY

R-3 is a departure from the popular R-1, and many people refer to them as turf tires. Turf tires are the most common tire found on sub-compact tractors and lawn equipment, but turf farms, golf courses, and institutions with vast expanses of grassy areas use them on full-size tractors as well. As the name implies, turf tires are your best option when you need traction on a green expanse without tearing up the lawn.

Turf tires also tend to offer far better flotation in the field, compact the earth far less than other styles, and tend to have better road manners compared to an R-1 style. Many farmers in New England use turf tires for tractors that have to traverse roads and hard surfaces often, but they do avoid mud like the plague since mud is a turf tire's kryptonite. Once their treads are loaded with mud, it's nothing but spin city for a turf tire.

Turf tires offer traction without destroying grassy areas.

THE BEST TRACTOR TIRES

R-4 is what I like to call "The Great Compromise" of agricultural tires. Commonly referred to as "industrial" or "commercial" treads, the R-4 is not an aggressive R-1, nor is it a tip-toeing turf tire by any means. R-4 tires are gaining popularity as the best tractor tire for many small farms because they offer excellent traction without being super aggressive. R-4 tires offer some flotation to keep you from digging in too deep, and road manners that won't make you hate pavement. These tires don't destroy turf like an R-1, but they will tear up the grass, so this is not a great tire for lawn duty. This tread style will likely benefit from loading with tractor tire fluid or foam.

R-4 tires are gaining popularity as the best tractor tire for many small farms because they offer excellent traction without being super aggressive.

FLOATING ALONG

HF (High Flotation) series tires are wide tires that operate at low internal pressures so they allow tractors, trailers, or implements to "float" atop surfaces. These tires come in various tread depths, ranging from HF-1 (being the least aggressive), and HF-4 (being the most aggressive). These are not a general purpose tire but instead designed for commercial field farming or forestry applications, where soil compaction is a significant concern. It is unlikely that a small farmer, or especially a homesteader, would have a use for such a tire, but they are available nonetheless.

CLASSIC TRACTORS

F (Front) series tires are becoming less and less popular, mainly because today's modern tractors are predominantly four-wheel drive, unlike the older tractors. F series tires aren't designed to offer any forward traction, but instead, are intended for non-powered front axles and offer varying degrees of side-to-side traction for steering purposes.

A classic F-1 design, also known as a mono-rib, features a sharp centerline rib structure that digs deep into the earth and allows a

two-wheel drive tractor to steer in the field. Now predominantly used in planting implements, classic F-1 tires are not used often on tractors today. Modern F-1 designs, such as Carlisle brand's "Farm Specialist F-1" is a shallow multi-rib design that is more road-friendly, as opposed to the classic F-1.

SECOND GENERATION

F-2 style tires also offer a prominent center rib design, but also include lesser ribs on either side of the dominant center rib. This model looks a lot like the F-1 but is more manageable on hard surfaces without losing its aggressive side-to-side slide resistance. F-2 tires are effectively the 2nd generation of the F-1.

HEAVY DUTY

F-2M style tires feature a four-rib design and are intended for heavy two-wheel drive tractors. Being a compromise between aggressive, deep digging ribs, and road-friendly side traction, the F-2M style is the best tractor tire for the many two-wheel drive tractors that are still dragging plows today.

BACKHOES

F-3 style tractor tires are an industrial tire found on the front end of many dedicated two-wheel drive backhoe loaders. These are a specialty tire designed to perform on hard surfaces and resist rough treatment on a construction site. If you have a backhoe tractor, then these may be your ticket, but if you have a farm tractor with a backhoe attachment, these won't perform well for you.

CUT TO THE CHASE

Now that I've confused you with options, let's boil it all down. For the vast majority of today's modern small farm tractors, an R-1, R-3, or R-4 tire will be your best tractor tires.

For general farm use where you don't have a lawn to worry about, the standard R-1 agricultural cleat tire will serve you well in dirt, mud, and snow. If you've bought a belly mower or an estate mower for your tractor, then you'll find the best results with an R-3 turf tire. If you need to traverse a lawn on occasion, operate on paved surfaces, yet still have traction in mud or snow, then R-4 industrial tires will be the best tractor tires for you.

These classic agricultural tires will serve well in dirt, mud, and snow, making it a versatile option for many farmers.

TRACTOR TIRE CHART

TIRE	SURFACE	APPLICATION
R-1	Dirt, Mud, Snow	Typical Farm Use
R-1W	Slick Mud or Clay	Manure Pits or Clay Fields
R-1HA	Field Wind Rows	Row Cropping in Fields
R-2	Bogs, Paddies	Rice or Cranberry Farming
R-3	Lawn and Turf	Lawns, Hay, or Golf Courses
R-4	Dirt, Snow, Hard Surfaces	General Farm or Industrial
HF	Dirt and Sand	Low Compaction, Industrial
F-1	Fieldwork	Classic Front Axle Design
F-2	Fieldwork	2nd Generation of F-1
F-2M	Fieldwork	Heavy Farm Tractors
F-3	Hard Surfaces	Backhoe, Industrial

Driveway Graders and Grading Techniques

Driveway Drag Harrows and Other Grading Implements

By Jeremy Chartier

A DRIVEWAY GRADER IMPLEMENT IS one of those often forgotten but surprisingly useful compact tractor implements. Those of us who are fortunate enough to have homesteads with any appreciable amount of acreage can agree; long dirt driveways can be challenging. Erosion, traffic, rutting, and the effects of snow plowing can wreak havoc on your dirt or gravel driveway.

The only way to keep these surfaces in traversable condition is to maintain them, which requires the right tools. Like any job, some tools work better than others and your needs will largely dictate which tool you choose. Let's talk about some tractor implements available and which job they fit best.

DRIVEWAY GRADERS

CHAIN DRAGS

If you don't have a tractor with a three-point hitch, this is likely your best method of grooming your driveway. A chain drag (or drag harrow) is a driveway grader that you quite literally drag behind your tractor, or truck if need be. Many farmers make a simple one from a section of chain link fence. It's a simple tool, but it's limited in what it can do.

Much like taking an army of rake-wielding landscapers to your driveway, a chain drag effectively rakes the ground lightly. A chain drag is not a particularly aggressive implement, which is why it will take several passes to accomplish the desired result. Chain drags don't handle heavy ruts or severe crowns well, so groom your driveway regularly to keep ahead of it.

LANDSCAPE RAKES

Three-point rakes are a versatile implement that I find myself using often. From tidying up the driveway to raking freshly cleared land, the landscape rake is my go-to tool.

Your standard landscape rake is a simple affair, consisting of flexible tines attached to a bar. That bar can angle from side to side to allow the operator to cast material to one side of their path. All other adjustments of a landscape rake come from your tractor, such as pitch angle and down force.

York rakes make for a great multi-purpose implement and do a great job of resurfacing loose material. Most dirt and gravel driveways are easily resurfaced with this type of driveway grader, but particularly hard surfaces are not easily dealt with.

GRADER BLADES

Much like the professional road graders used by your town or state Department of Transportation, three-point grader blade implements feature an adjustable blade that can aggressively cut dirt or gravel surfaces. When you have a severely damaged or neglected driveway, this is a great tool to have.

Just like a York rake, you have the option to angle these blades side to side. Your pitch, downforce, and all other adjustments are still handled by your three-point hitch. Unlike the York, this style of driveway grader features what looks like a short snow plow instead of rake tines. When you trade flexible rake tines for a stiff blade with a proper cutting edge, you gain a more aggressive cut, which may or may not be a great choice for you.

If your driveway simply needs a little grooming then this driveway grader is likely too aggressive for you. If you have big stones lurking under the immediate surface of your driveway, you may catch one big enough to stop your machine dead in its tracks. If your driveway has a tendency to develop big pot holes, pronounced crowns between tire ruts, or you see sections getting washed out a lot, then this is a great tool for you. Also, if you need to pitch your driveway surface or add drainage ditches, then a grader blade will do wonders.

SCRAPER BOXES

If you think grader blades make for an aggressive driveway grader, then you've never met one of these monsters. Scraper boxes are an aggressive earth-moving device that does the job very well, likely too well for most people.

Scraper boxes look much like they sound; it's a big box of unforgiving steel. Grader boxes have no angle adjustments with exception to the pitch your three-point hitch gives it. Imagine a grader blade that's been boxed in, then a set of

really aggressive tines are set in front of that blade and now you have a pretty good idea of a grader box.

If your driveway is soft dirt or relatively loose gravel, then this is the wrong tool for you. Scraper boxes are king when it comes to hardpan and clay. The aggressive nature of the tines makes it easier to break the surface, unlike a rake or drag harrow which would simply skate across a hard surface.

This style of driveway grader is yet another option. It features two blades and tines like a grader box. This style of driveway grader is slowly catching on but is not widely popular yet.

DRIVEWAY GRADER OPTIONS

Before blindly buying an implement, ask around. Someone in your area is bound to have one of these implements, so ask how well they perform. Is your driveway soft and sandy? If so, a driveway drag harrow will probably do just fine.

Do you have stiff dirt or stone? Do you need the tines to give way to big rocks lurking in the surface? If that's the case, then a landscape rake will be a great start for you.

Does your driveway have some severe crowns? Do you need the ability to pitch the surface one way or another? Do you have drainage ditches you need to re-carve? Then a grader blade sounds like the right tool for the job.

Lastly, if you have a really hard surface like clay or some sort of hardpan material, then you probably need to reach for the big guns. A scraper box will prove to be an aggressive implement, but with practice and finesse, you can achieve some great results. If you do need such a tool, consider using a York rake in conjunction with it to smooth things out after roughing it all up.

HOW TO GRADE A DRIVEWAY

Learning how to grade a driveway is not all that difficult, but some basic concepts and tips will make the process easier. For those of us who have long dirt driveways that have a mind of their own, it makes sense to keep them in good shape. Don't wait for it to become a critical issue! Pin your driveway grader to your tractor and let's get down to business.

COMPACTION

When we drive vehicles and equipment along the same path over and over, we create the "cart path" effect. This is caused by the weight of our cars, trucks, and equipment rolling over the same two tracks, compacting the soil in those areas. If you have an existing two-track driveway that is otherwise traversable, consider filling the ruts with stone instead of cutting the crown and pushing the dirt into the ruts.

Filling ruts with stone gives your tires something harder to ride on and will bring your driveway back to its original grade level, instead of cutting the crown and reducing the overall height of your driveway. Simply grading the crown may be a low-cost construction technique, but over time you'll notice that your driveway will look less like a driveway and more like a trough or shallow river bed.

This style of driveway grader is yet another option. It features two blades and tines like a grader box. This style of driveway grader is slowly catching on but is not widely popular yet.

Use your adjustable lift arms to alter the pitch of your driveway grader.

SNOW AND FROST

For those of us in snow country, we get to deal with the added complication of frost and snow. Frost heaving, the resulting potholes, and the stones pushed to the surface all need to be dealt with. Not only that, but the act of plowing snow also moves material around, especially when there's snow but the ground hasn't frozen yet. You may find your gravel piled up where you plowed snow, so be prepared to drag that material back to where it's needed.

EROSION

Water can hasten driveway deterioration. Existing compaction ruts create a low point for runoff water to follow. As water flows down these ruts, erosion cuts them deeper and deeper. Even driveways that have no ruts can experience erosion, especially if they have more dirt than gravel. Water will find the lowest point and carve its own path, usually in an inconvenient location.

Water also makes driveways muddy, which leads to ruts. Since water likes to collect in low spots, make sure your driveway isn't one. Slope low points, or even create a ditch that sits lower than your driveway to give the water somewhere else to go. Mud alongside your driveway isn't an issue, but mud in the middle of your driveway is, so take that into consideration when deciding how to grade a driveway.

CROWNING

Crowning a road stops water from collecting and pooling on the driveway. Unlike the severe crowning of a neglected two-track, an intentional crown leaves a slight peak in the middle of the road which sheds water from the center. If you have a long stretch of flat driveway, adding a slight crown to it will stop puddling in the middle of your driveway.

Crowning is an effective way to shed water, but remember that water is going somewhere if you like it or not. Concentrating the water runoff on the sides of your driveway will create ditches, but those erosion ditches may undermine the driveway. Be proactive and provide a definite path for your water runoff, and line it with a coarse gravel to reduce the erosion if need be.

Erosion can creep up on you. This driveway used to be level with the ground to the right of the photo.

Learning how to grade a driveway is not all that difficult, but some basic concepts and tips will make the process easier. For those of us who have long dirt driveways that have a mind of their own, it makes sense to keep them in good shape. Don't wait for it to become a critical issue!

GRADING TECHNIQUES

Sometimes you can get away with a quick and simple flat grade, but that's not always the best course of action. If you've decided to add drainage ditches, correct a pitch, or form a proper crown, you'll need to properly adjust your driveway grader.

For those of us using a tractor with an adjustable three-point hitch, we need to take care in how we set up our implement. Landscape rakes and grader blades are typically a light to medium draft implement, which means the top link needs to be in the lowest pin hole available. Scraper boxes are typically considered a heavy draft implement, so be sure to use the top pin hole. Verify this with your tractor's manual just to be sure.

Most tractors feature adjustable lift arms. For forming a flat grade, maintain your two lift arms in the level position. If you want to add a crown with your rake or dig a ditch with a grader blade or grader box, then you need to adjust your lift arms to put your implement on a slant. Once properly slanted, your implement will carve your desired grade.

ADDING MATERIAL

When deciding how to grade a driveway, many people settle on a crushed gravel sized somewhere between a ¾ and 1 ½-inch. For those of us with a tractor, we can explore other options such as a 2-inch or larger size, since we have the equipment to manage it. A ¾-inch gravel makes for a smooth surface when groomed, but it's far easier to wash away versus a 2-inch or larger gravel. If you just can't keep your stone in place, try graduating to a larger sized gravel. Larger gravel is more difficult to work with, which is why it's not as popular as the smaller sizes, but when you have a tractor and driveway grading implement, it's nothing you can't handle.

YOUR MILEAGE MAY VARY

Everyone's situation calls for different considerations. Weather patterns, local soil composition, the implements you have available and even the size or power rating of your machine will largely dictate how you decide to manage your driveway. My goal here was to give you some food for thought, and hopefully, answer some questions along the way.

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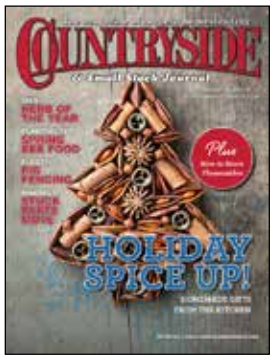

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