

Rx Burn Equipment for small acreage landowners – Ray Hinnant

As recent as 70 to 100 years ago, wildfires were nearly non-existent in most areas of Texas. Landowners farmed their land or utilized livestock to graze most of the available forage if not nearly all of it, creating a natural fire-resistant ecosystem. As better management practices were developed and practiced and as landowners began changing from subsistence farming to land speculation and retirement living, wildfires have become more common. Pastures were allowed to produce fuel rather than forage which increased wildfire susceptibility. Early attempts at wildfire suppression included wet toe sacks, water-soaked brooms, or even coats. Larger ranches used livestock sprayers or road machinery to fight wildfires. As larger ranches and farms are split up and sold, there are a lot of small acreage landowners moving into rural settings which are secluded by design. What kind of equipment do they need for wildfire suppression and prescribed burning?

Some of the new landowners were and are interested in reintroducing fire frequency for ecosystem restoration. To apply fire to the land, they needed to be trained by education and experience and to begin formation of neighbor helping neighbor Prescribed Burn Associations (PBAs). It quickly became obvious that individuals and PBAs needed to have some equipment to quickly identify and mitigate spot fires before they grow to a wildfire. Larger landowners usually have more equipment than small acreage landowners, if nothing else than scale of operation. One of the topics that is presented at all prescribed burn training is equipment. Equipment includes personal equipment such as clothing and goggles, hand tools, hand sprayers, and sprayers mounted on either pickups, four wheelers (ATVs), or UTVs. Sprayers are usually built on some kind of frame so it can be easily moved from storage to the back of the unit. Construct the frame out of 1" – 1 ½" thin wall tubing to keep it as light weight as possible.

Equipment used by local Volunteer Fire Departments and state and federal agencies is specifically designed for fighting wildfires and structure fires. The resources available to these groups facilitate the



purchase of high-quality durable and effective pumps, tanks, nozzles, and vehicles. While they are well maintained, they are available to others in the organization to utilize so they must be strong and dependable. Most of this equipment can be used on a prescribed burn, but they are not usually built for that use. While the typical equipment available for a PBA burn may not be the most expensive or durable, we can purchase or fabricate equipment that will assist on a prescribed burn and also be available to assist in a wildfire situation.

SCTPBA has equipment that can be loaned out to landowner members interested in conducting a

prescribed burn such as spray rigs, hand tools, drafting water pumps, radios, signs, etc. The spray rigs are useful, but the landowner must have some kind of way to transport the spray rigs during a burn. Some members have ATVs or UTVs and some have trailers to transport these vehicles to other members' property for a prescribed burn, but others do not. If you live in the country, it is a good idea for you to have some basic fire fighting equipment so that should a wildfire trespass on your property you will have the means to begin suppression prior to the arrival of the Volunteer Fire Departments or other entities. This equipment can also be used to assist your fellow PBA members on their prescribed burns or on your own. If you have an ATV or UTV, there are commercial units that can be purchased, or

you can build your own. This paper will assist you in determining what suppression unit is right for you and your situation.

Prescribed burns are 97% sheer boredom and can be 3 percent sheer terror. When everything goes as planned, water from a spray rig may not even be needed. However, it is prudent to have equipment available to handle the 3% terror times. What is a spray rig? A spray rig consists of a tank from 10 to 220-gallon capacity or larger, a pump to pressurize the water through some kind of hose to a hand spray nozzle. There are many different kinds and shapes for water tanks from all metal to polyethylene or other petroleum-based products. 55-gallon drums can even make acceptable spray tanks. The pumps can be either 12v electric or gasoline engine powered or even power them off a PTO on your tractor. There are many different configurations of either of these pumps such horsepower, as PSI (pounds per square inch) of pressure and GPM (gallons per minute) or GPH (gallons per hour) flow rate based primarily on the usage of the pump such as spraying insecticide or herbicide or fighting fire. For reference, the typical home water hose is approximately 50 PSI and 13-17 GPM. If you are trying to fight a wildfire, you will need a pump capable of producing at least 100 PSI and 75 to over 100 GPM. The hand nozzle wands also come in many different sizes and configurations and can range from a few dollars to several hundred dollars. Some kind of frame is not necessary, but certainly makes it easier to set up and have available when needed.

Gasoline pumps for the 65-100-gal tanks are usually 1" to 1.5" outlet 1 – 3 hp pumps capable of delivering 60 to 100 psi and 35 to 100 gpm. These pumps have a shorter 1" hose for spraying and may or may not have a hose reel. They must also have some kind of return to the tank so that if the pump is not spraying, water can always travel through the pump to keep it cool. For tanks >200 gallons, a 5-10 hp pump with 2" to 3" fittings are common. Pumps that are usually used for prescribed burns and wildfire suppression are called high pressure pumps and start at 100 psi. The 100 psi pumps are available from several dealers and are cost effective. Higher psi pumps are usually much more expensive and require cleaner water. They can also be plumbed to draft from a tank or other water source if more water is needed on the Fireline. Gasoline spray pumps take more training to use, more maintenance, and typically must be running continuously during the burn. The spray nozzles used for these pumps and tanks are typically quality twist or bail nozzles developed strictly for firefighting. The addition of a ball valve will allow the user to quickly begin spraying water without having to adjust the nozzle.

Pickup slip-in sprayers are ideal for catching spot fires right behind the lead drip torch person or to effectively attack a spot fire that has developed into a wildfire. In deep sand and heavy clay soils,



pickups can easily be stuck, especially with an extra ton of spray rig and water in the bed. With this much weight a 4-wheel drive pickup is preferred. A half-ton pickup can easily carry a 65 – 100-gal water tank. A ¾ or 1 ton truck can safely carry a 200–220-gal tank. A suggested add for these slip-in units is to add a 12v on-demand pump of 60psi and 4-5.5 gpm for mop up and instantaneous use if need be. A

metal frame is usually made to hold the tank and pump and if built in a cubic configuration, it doubles as something for the person in the bed of the truck to hold onto while suppressing the fire. For fire use, the pump should have a reliable engine and a centrifugal pump. Because our prescribed burn sites are small and often the soil is wet, the use of a pickup is not reliable.



UTV spray rigs are usually made very similar to the pickup slip-in units with the 65-gal tanks being the most used. If gasoline pumps are used, the 1-3 hp are very easy to adapt to the metal frame. These engines and pumps should produce between 60 and 80 psi and deliver 30 to 50 gpm. The downside to the gasoline engine pumps is limited spraying time. If the pump is rated at 50 gpm, it will take less than 2 minutes to empty your 65-gal tank. Plumbing on these units should be like the larger truck units. UTVs can also utilize 12v on-demand pumps for fire suppression and mop-up and should be at least 60psi with 4 to 5.5 gpm water delivery (12 to 15 minutes of spray time for a 65-gal tank).

The 12v pump units quickly handle spot fires and it makes a great mop-up unit especially if a hose reel is added. There are a lot of different types of wand nozzles for the 12v pumps. 12v on-demand pumps are also easier to plumb, cheaper, and there is less maintenance than for a gasoline pump. Personally, I like the metal water pistol nozzles from the box stores which cost less than \$10 and can be easily changed from fan to spray with a hand lever. The wands that have a long barrel tend to be cumbersome to use.

ATV spray rigs are front or rear mounted on a 4-wheeler with a fairly short hose to prevent getting tangled up with tires and trees. The tanks for these units are typically from 10 to 20 gal and have a 12v on-demand pump mounted directly on the tank.



Tanks with 12v pumps, hoses, and wands are available from many sources. The tanks and hoses are ok for fireline use, but the typical 1.8 gpm pumps must be replaced by a 4-5.5 gpm and replace the included wand with the water pistol nozzle. The size of the ATV will determine the size of the tank and whether the unit can be mounted on the front rack or the rear one. These units, when filled with water, totally change the handling and safety of the 4-wheeler so be very careful.

Use what you have! If you have a tractor, you can install a roller pump on the PTO shaft and a larger water tank on a frame which will attach to your three-point hookup. Routing the sprayer hose on a tractor is critical so that it doesn't interfere with wheels or levers. Remember that roller pumps require clean water so you can't draft out of a creek or pond. For small acreage burns, an ATV type spray unit can be used on a garden tractor with a fabricated rack or installed on the deck of a zero-turn mower. These are not fast attack units, but for preventing grass bridges, mop-up, or to quickly spray out a spot fire if close to the fire line.



Engine	HP	Pump	Hose fitting	PSI	GPM	Tank size	Spray time	Pump Cost
Gas	1	centrifugal	1"	65	100	50-100	<2 min	\$500+
for drafting	3	centrifugal	1.5"	35	35	50-100	3-4 min	< \$500
	5-10	centrifugal	2-3"	100+	100+	200+	2-4 min	\$500-\$11500
Fire Pump	5-10	centrifugal	2-3"	>100	70 - 200	200+	1-5 min	\$2 - \$5,000
High pressure	3-5	Piston	.5"	350	5	50-100	10-60	\$2,000+
Electric	12V	On-demand	.5"	65	4-5	50-100	15-25	\$130 to \$200

Spray rigs built and used in a trailer configuration are not recommended to be used during the prescribed burn. They can be too hard to back out of the way on a fire line if another suppression unit is needed in the area. Trailer mounted units can be used effectively for supplying water for a wet line when utilizing a mowed and raked fire line. The operator must be aware that if there is a spot fire, they must move to a safe spot out of the way and become a water source for the other suppression units.

All the previously mentioned spray rigs will work great to quickly attack a small spot fire before it becomes a larger wildfire. They can also be used effectively to fight a spot fire that has grown until help from other units on the burn can assist or until the Volunteer Fire Department in the area which has been summoned arrives. If you are not trained to attack a larger spot fire or wildfire, assist in other ways such as manning larger storage tanks and transfer pumps.

While our PBA has several smaller spray units for use, it is a prudent idea for you to purchase or build one to use on your prescribed burns and for fire mitigation on your property. If you keep it operational and ready for use it may save your home or other property.

