

# ATVs or 4-Wheelers Offer a Stable Platform for Rough Terrain Weed Management

**Editor's Note:** This TechLine article outlines the ATV sprayer experiences of federal and state resource managers and applicators who contract weed control work on public lands. This article will speed up your learning curve and save you time by detailing what your colleagues who use ATVs like the one pictured at right have learned from their field experiences.

**A**pplying herbicides on steep, rough terrain where weed infestations are often isolated and scattered over great distances requires knowledge, precision, and perseverance. Four-wheel all terrain vehicles (ATVs or 4-wheelers) offer a stable platform for transporting application equipment and applicators over rough terrain. Back country weed management is often hand work, utilizing either backpack units or hose spraying from a truck or other vehicle. ATVs can expand the range of an applicator, safely travel with minimum impact into areas often inaccessible to full-size vehicles, and increase daily efficiency which maximizes budgets.

These features translate into less operator fatigue and greater range and mobility. The benefits are more terrain covered each day, increased personnel safety, and a higher degree of spraying accuracy since operators stay fresher and more focused.

## BLM Experience

Pat Fosse, BLM assistant area manager in Fillmore, Utah, has increased the ATVs used in their district to five four-wheel drive units with automatic transmissions that carry 28 or 34 gallon sprayer



units. "We couldn't have a weed program without the ATVs," she says. "We treat the little trails, two-track roads, and draws where larger units cannot operate efficiently. Overall we are treating one and a half times more area with the same staff that we did before we had the ATVs. And since we mounted the units with Boom Buster broadcast nozzles, we treat four to five times more area each day than we did when all we had were handguns on the units."

Fosse says they can still spot spray, but they use Gun Jet pistol nozzles instead of wands. The pistol-type handguns are easier on operators' hands and arms and safer since they are less likely to become entangled in the ATV's wheels.

"These units are only efficient if you can keep them working. We had too much downtime with our nurse tank trailers until we invested in a well-built water trailer with puncture-resistant tires. Some days the five ATVs use 600 gallons of

water, so the nurse tank truck and trailer are key elements," Fosse says. "We also improved efficiency when we upgraded to larger capacity pumps. You need a 4.9 gpm pump to avoid problems."

## Building an ATV Sprayer

Many companies will custom build sprayers to your specifications or you can purchase complete units "off-the-shelf." This article details a typical ATV unit but does not endorse any one brand of all terrain vehicle or brand of spray equipment. It details the features that experienced users deem important for rough terrain and back country weed management. All prices mentioned are current retail prices and will change without notice and can vary among dealers, regions, and government bids. Please refer to local dealers and suppliers for up-to-date information and prices.

**See "ATV Sprayers" on next page**



## Recommended ATV Features to Consider:

### 1. Four wheel drive or two wheel drive?

Arlen Mickelsen with Superior Outdoor Power Center in Superior, Neb. says overwhelmingly, applicators prefer four wheel drive ATVs. Mickelsen has assembled scores of ATV units for herbicide application. He explains in four-wheel models there is no need to counter steer on hillsides to maintain balance and traction. "Because the front ends are heavier and the front wheels travel faster than the rear, the machine is pulled into the hill, which provides greater stability and safety," he says.

Mickelsen recommends a four-wheel drive model with a front differential. "This eliminates front end hopping when turning from one type of surface (mud to dry) onto another since the tires travel at varying speeds. Some manufacturers also offer lock-in, lock-out features on 4-wheel drive models which lets the operator switch to easier turning 2-wheel drive when on level surfaces or when working in tight areas."

### 2. Suspension

Independent 4-wheel suspension offers excellent side-hill stability and improved ride, however clearance is reduced and under heavy load can be a mushier ride. Double A-arm solid rear suspension offers good handling and cornering, but is also a stiffer ride than independent or strut rear suspension.

Mono-shock, strut rear suspension offers a better ride, but softer handling. This is still the dominant rear suspension in the industry and offers excellent riding characteristics, less maintenance, and long durability.

### 3. Manual or Automatic Transmission?

Manual Transmissions - manuals still dominate the industry and offer more constant speed control because they are gear to gear and not belt driven. Because they have been built longer than automatics, manual transmissions offer excellent durability and less maintenance than automatics and are lower in price. Honda features a push button manual transmission that eliminates the need to foot clutch.

Automatic Transmissions - automatic transmission

technology is advancing rapidly. Automatics are easier to use for less-experienced riders and many experienced applicators prefer their ease of use. Automatics coupled with a braking clutch so brake use is minimized are listed as the ideal combination by experienced users.

Most automatics are belt driven, which means at certain low speeds belts tighten and loosen and the clutch kicks in and out repeatedly making it harder to maintain a constant speed, which is important for some types of spray work.

Yamaha has developed a new automatic that maintains belt tightness at all times, which offers longer idling times and maintains a constant speed much like a manual transmission. However, this feature costs \$300 to \$400 more than standard automatics.

### 4. Chain or shaft drive?

Most ATV manufacturers offer either chain or direct drive choices on many of their models. Direct drives are preferred by applicators because they require less maintenance and longer durability. Chain drives require regular and consistent servicing to maintain performance.

### 5. Tires

Mickelsen recommends a minimum of 4-ply rated tires for off-road weed control work with an ATV. Puncture resistant tires are also recommended for rough terrain. Specialty Tires offer a tire with two Kevlar belts that come in 8 to 12 inch, 4 ply sizes that sell for \$83 to \$100 each. Blackwater Tire also makes a heavy duty, puncture resistant tire line that sells for \$100 each. GBC Tire Company offers a good all-around 4-ply tire series with v-tread or agri-tread patterns that average \$68 each, according to Mickelsen.

### 6. Seat Height

Seat height in relation to ground clearance is a critical feature to consider, Mickelsen says. As machines gain ground clearance, some models also position the seat higher, to the point that the model may not offer as much side-hill stability as other models that position the seat lower on the machine. "As ground clearance increases, machine width should also increase," he states. "Look for models that offer as low a seat position as possible for working in steep areas."

### 7. Brakes

Brakes have improved drastically on ATVs in recent years, increasing their safety. Enclosed rear drum brakes, sealed from dirt and moisture, offer the highest level of durability and performance and need the least amount of servicing.

# Building The Right ATV Sprayer for Rough Terrain



1. **Two tanks** balance the unit and increase spraying range, which increases operator efficiency and lowers costs.

2. **A pump** rated at 4.9 gpm is the largest made and recommended for consistent spray patterns and durability.



3. **Handgun** with at least 25-50 ft. of hose enables applicators to spot treat with precision to protect off-target vegetation. Longer hoses reduce efficiency.



4. **Boom Buster Nozzles** (below) mounted on rear with valves so nozzles can be operated together or separately. Nozzles spray 8 to 15 ft. on either side or 16 to 30 ft. when operated together. These nozzles produce uniform patterns (left), reduce drift significantly, and eliminate booms and weight. Many back-country areas can be broadcast sprayed efficiently with these nozzles without hitting off-target vegetation.



5. **Gauges and Connectors** - make sure to specify and use good connectors. Loose connections drop amperage causing the pump to lose revolutions which ruins accurate calibration. Include a pressure gauge in-line from pump to nozzles and filters in the re-circulation line and on both tanks.

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## Building The Right ATV Sprayer for Rough Terrain



**6. Switches** - For maximum efficiency include two sets of on-off switches, one on handle bars, one on each tank.



**7. Independent 4-wheel Suspension** - offers excellent side-hill stability and improved ride, however clearance is reduced and under heavy load can be a mushier ride.



**7. Drains** - in-line drains speed cleaning, increase equipment life, and reduce labor costs.

### Typical ATV Sprayer Unit and Estimated Price Range:

#### 1. Tanks – \$65-85

Front, Raven 15-gallon poly tank with bottom drain. Rear, Raven 25-gallon poly tank. A minimum 3/4 -inch line should connect the tanks.

#### 2. Pump – \$120-135

Flo-Jet 4300-143 pump rated at 4.9 gpm is the largest made and recommended for consistent spray patterns and durability. Many new pumps have a pressure regulator switch included. If not, include a pressure regulator in the line.

#### 3. Miscellaneous – \$80 - \$100

This includes connectors, fittings, filters, and gauges. Include a pressure gauge in-line from pump to nozzles and filters in the re-circulation line and on both tanks. For maximum efficiency include two sets of on-off switches, one on handle bars, one on each tank.

Electrical connectors - make sure to specify and use good connectors. Loose connections drop amperage

causing the pump to lose revolutions which ruins accurate calibration.

**4. Green Guard Handgun – \$100 - \$120** with 25-ft. of hose.

**5. Boom Buster Nozzles – \$180-\$200** for two plus fittings. Mount on rear with valves so nozzles can be operated together or separately. Nozzles spray 8 to 15 ft. on either side or 16 to 30 ft. when operated together.

**6. Custom built frame to hitch** – this configuration provides better support for the rear tank than fender mounts. Four bolts on each tank make removal quick and easy.

**7. Per unit price if purchased together** - \$355 for complete tank setup, tested ready to spray, plus Boom Busters and brackets which are additional. Most suppliers sell equipment packages which allow you to assemble your own sprayer. These packages cost \$60 to \$80 less than the pre-assembled units. 