The Safe Use Of ATVs In Agriculture

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The all-terrain vehicle (ATV), also called the “three-wheeler” or “four wheeler,” was initially developed in Japan for farm-to-town transportation in isolated, mountainous areas. During spring thaws and rainy seasons, steep mountainous roads were often impassable with conventional vehicles. These vehicles soon became popular for recreational use, providing transportation to areas inaccessible by other motorized transport. Japanese manufacturers realized that the ATV could be sold to Americans.

When the ATV first appeared in the United States in the 1970s, it was promoted and sold as a recreational vehicle designed to provide “thrills” for the rider. Shortly, however, sport and recreation operators found that the ATV was a useful machine to move through areas not accessible with pick-up trucks, four-wheel drives, or other motorized vehicles, and the ATV became a popular hunting vehicle.

ATVs in Agriculture

In the 1980s, the ATV was finding a use in agriculture as a substitute for pick-up trucks, horses, tractors, and even walking. The ATV can now be found on all types of farms, ranches, and orchards, in the forest, in the ornamental nursery, and on the golf course.

ATVs are used to inspect crops and livestock, to inspect and repair irrigation systems and fence lines, to supervise field crews, to herd livestock, mark timber, to seed, to fertilize and apply chemicals, to mow grass, to move dirt, to transport things from here to there and back again.

An ATV offers a new sense of freedom to individuals with mobility handicaps: it can be the wheelchair for the farm, ranch, and orchards. It can enable these individuals to take a more active role in the operations and management of the business.

ATVs Can Be Dangerous

The Consumer Product Safety Commission reports that in a recent year an estimated 90,000 individuals were treated for ATV-related injuries in hospital emergency rooms; nearly 10,000 were hospitalized and over 120 deaths were recorded. Nearly 50 percent of the injured persons and fatalities were less than 16 years of age. Twenty percent of the fatalities were children under 12 years of age. A recent study indicated that 16.4 percent of all ATV accidents occurred on the farm, resulting in more than 20 fatalities annually on American farms. This number is expected to grow as the ATV becomes a more common agricultural machine. Clearly, the ATV can be a dangerous vehicle.

Some ATV operating guidelines are:

- ATVs are not toys; children under the age of 12 should not operate or be permitted to ride ATVs.
- Children between the ages of 12 and 15 often lack the physical size to operate or control the machine. They should not operate adult-size (greater than 90cc) ATVs.
- Do not ride double; the unique handling characteristics of the ATV require that the operator shift both weight and position on the seat to steer and control the vehicle. Riders hamper the operator’s ability to steer and control the ATV.
- Since ATVs are small and low to the ground, they are not as visible as larger vehicles. Lights, reflectors, and highly visible flags should be used so the ATV is easier to see.
- Never ride the ATV on public roads, or when alcohol or drugs are in the bloodstream. In nearly 10 percent of all injuries, and in 30 percent of all fatal ATV accidents, alcohol use was a contributing factor.

This fact sheet is adapted from a publication by Dr. William J. Becker, Professor and Extension Safety Specialist, University of Florida.
ATVs may have automatic clutches, hand clutches, or fully automatic transmissions. Some have a reverse gear. Other models have power take-off drives. There are ATVs with chain drives or shaft drives. Others have solid drive axles, while others have differentials allowing the rear wheels to turn independently. Most differentials can be “locked”, causing both wheels to turn uniformly to provide additional traction. For most agricultural operations, an ATV with an automatic clutch, reverse gear, shaft drive, and a differential with a locking mechanism would be appropriate.

A solid drive axle or a locked differential give the ATV its unique, difficult and dangerous turning characteristics. Because both rear wheels rotate at the same speed, the weight of the machine must be reduced on the inside rear wheel to enable it to turn. The inside rear wheel can then slip throughout the turn. This maneuver by the operator — shifting body weight forward and to the outside foot peg or rest — causes the machine to be less stable and increases the risk of a side overturn.

An automatic clutch reduces chances of “popping-the-clutch,” which can result in rear overturns. The solid shaft drive is more trouble-free than a chain drive and is nearly always found on ATVs with a differential. The advantages of a reverse gear are obvious.

A power take-off is available on some models, for operating mowers, spray equipment, and other machinery. The anticipated use of the machine would determine whether or not this feature is desired.

ATVs come equipped with engines ranging from less than 100cc to more than 500cc, and with gear ratios which will permit speeds in excess of 50 mph. The use(s) planned for the ATV should determine the size of the engine and the gear ratio. There are few, if any, reasons for a maximum speed of more than 25 mph in any agricultural operation. Make sure the ATV’s gear ratio fits your needs. Serious ATV accidents are frequent at higher speeds.

ATVs can have electric, kick, or pull recoil starters. Recoil starters are less expensive but can be frustrating if the engine is hard to start. Electric starters are more costly and require a battery, but are more convenient.

### Drive Lines

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### Power and Speed

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### Other Features

ATVs can have electric, kick, or pull recoil starters. Recoil starters are less expensive but can be frustrating if the engine is hard to start. Electric starters are more costly and require a battery, but are more convenient.
The seat should be wide enough to give good support and be well-padded to prevent “saddle sores.” A light-colored seat will stay cooler when exposed to the hot sun.

The ATV should have both front and rear brakes with independent controls. The rear fenders and foot peg or rest should be designed to make it difficult or impossible for the foot to slip off and be caught under the rear wheel.

Roll bars, safety belts, and deflectors to keep branches from striking operators, are available for some models. Safety belts should never be used without a roll bar, but always with a roll bar. The use of the ATV should determine if these safety features should be added.

The muffler, exhaust, and other hot engine components should be located, or guarded, to prevent burns. The design should also prevent the buildup of dry trash near hot exhaust parts, to reduce the risk of fire.

If carrier racks are installed on the ATV, both front and rear racks are recommended. This permits the load to be balanced front and back for stability. Remember, any extra load in carriers, or a passenger, significantly raises the center of gravity of the loaded machine and increases the risk of an overturn.

**Preparing To Operate The ATV**

Before beginning to operate the ATV, three questions should be considered. First, is the operator ready? Second, is the ATV ready? Third, have the hazards of the environment and task been considered? Each question should be completely answered.

**Is the Operator Ready?**

Don’t be an unprepared operator, and don’t permit others to operate an ATV if they are ill-prepared. Inexperienced drivers, in their first month of using an ATV, have thirteen times the average risk of injury. Quality training should be provided. There are two sources of training programs in Pennsylvania.

One is from the Pennsylvania Department of Environmental Resources’ Snowmobile/ATV Unit. This program is designed for youthful riders, ages 10 to 15, who need a certificate to legally operate an ATV anywhere except on their parents or guardians property. The number to call for additional information is 717-783-9227.

The other source for a training program is the Pennsylvania affiliate of the Specialty Vehicle Institute of America (SVIA). This is a hands-on program that involves actual riding, and is appropriate for all age groups. More information about this program can be received by calling 412-564-2913 or 412-439-2674.

A videotape, produced by the SVIA, is available through Penn State Cooperative Extension. This 20 minute tape discusses the need for ATV safety, shows proper riding equipment and basic riding skills. It is available through your county extension office.

**Is the ATV Ready?**

This involves more than having adequate fuel and starting the engine. The machine should be maintained in accordance with the owner’s manual. Give special attention to the tires, brakes, and throttle. The tires must be uniformly inflated (2-6 psi); a one-pound difference in air pressure can cause control problems. You will need a low-pressure gauge; a regular tire gauge will not be accurate enough. The brakes must be adjusted to ensure a safe, straight stop. Check that the throttle operates smoothly in all steering positions. Regularly check all bolts and nuts, particularly the axle and wheel lug nuts. Whenever a wheel is changed, the lug nuts should be tightened after every two hours of operation until they set.

**Are There Task and Environmental Hazards?**

Consider task and travels for the day or trip. What are the tasks and what environmental hazards might be encountered? Give special attention to roads, terrain, slopes, ditches, blind intersections, trees, shrubs, and other vehicles or objects which might cause accidents. It is difficult to avoid potential accident situations if the operators are unaware of, or fail to recognize, the hazards.

**Personal Protective Equipment**

The hazards involved in operating an ATV demand serious consideration be given to proper personal protective equipment. The following equipment is particularly important.

**Helmet** Most experts recommend that a full-face helmet always be worn when riding an ATV, but some agricultural uses of the ATV are at a very low speed, where the helmet may interfere with close inspection
or become unbearably hot. However, if you are traveling at speeds in excess of 10 mph a full-face helmet should be worn. It should fit snugly and be securely fastened, and bear the American National Standards Institute label (ANSI z90.1 or equivalent).

The majority of serious accidents occur when the ATV overturns or collides with another vehicle or a fixed object. Speed is often a major contributing factor. An accident at 5 mph may not cause an injury, but at 20 mph it could be fatal. Helmets often mean the difference between life and death in these types of accidents.

**Face Shields and Goggles** For some operations at slow speeds, such as seeding and mowing, no head or face protection may be needed. For other slow-speed operations, such as working in woodlands or ornamental nurseries, a full-face shield or goggles should be worn. One branch or thorn in the eye and your sight might be lost. At higher speeds, face or eye protection should always be worn. A branch, small item, or even an insect could cause a serious eye injury.

The goggles or face shield should carry the American National Standard Institute label (ANSI z87.1 or equivalent) on the bottom or side of the lens or shield. Make certain the face shield or goggles are clean and reasonably free of scratches. Grey- or green-tinted shields or goggles are best in bright sunlight, but after sundown only clear lens shield or goggles should be worn.

**Boots or Shoes** Quality boots, or over-the-ankle work shoes with good heels, are a must. No one should be allowed to operate an ATV with anything less. Ideally, the soles and heels are made of slip-resistant materials, not leather or neoprene-type materials. While motorcycle or ATV-type boots are best, a good quality pair of over-the-ankle, tightly-laced work shoes are adequate for most agricultural operations.

**Gloves and Clothing** Gloves and clothing should be determined by the task. Long-sleeved shirts, full-length trousers, and well-padded gloves are normally recommended. They should be worn in nursery and forest-type environments to protect hands, arms, legs and body from serious cuts and punctures. Avoid loose-fitting clothes which could easily catch on a branch. However, in a open-field operation, less protective or different protective clothing might be dictated by the task.

**Pennsylvania’s All-Terrain Vehicle Law**

ATV use in Pennsylvania is governed by state law. The major parts of the law have to do with the registration and operation of ATVs, youthful operators, accident reports, liability, and law enforcement. Brochures that summarize important points of the law can be obtained by calling 717-783-9227.

Small ATVs, which are used exclusively for agricultural purposes, are classified in the Motor Vehicle Code as Multipurpose Agricultural Vehicle (MAV) and are exempt from the Pennsylvania ATV law. A MAV is defined in the Motor Vehicle Code as “a vehicle which is 50 inches or less in width and 600 pounds or less in dry weight and which is used exclusively for agricultural operation and only incidently operated or moved upon the highways.” An ATV that is used for dual purposes, that is, for both work and recreation, is not considered a MAV and thus would fall under the ATV law at all times. If you are unsure about the MAV designation, check with DER at the telephone number listed above.

For a copy of our Fact Sheet Listing contact:
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