Lesson 2: Plumbing Safety

Given the need for water in agricultural operations, good plumbing systems are a requirement. Although few people think of plumbing as dangerous, some dangers do exist when working with pipes and fittings. Therefore, using the proper tools and methods is important for safety.

Hazards of Plumbing

Plumbing may involve working in open trenches that range in depth from two to ten or more feet deep. If the trench is deep enough, people can suffocate if the sides cave in and bury them. The sides of any deep trench should be carefully observed for signs of instability, such as loose and collapsing areas. These areas should be avoided until they have been excavated to a safe point. Another situation that requires caution is if heavy excavating equipment is close to the sides of a trench, since the equipment can cause the earth to cave in. The equipment should be removed before anyone enters the area.

Plastic pipes require the use of cleaners and cements, or glues, that contain strong chemicals. These substances can be hazardous because they may produce very strong, sometimes toxic, fumes, making good ventilation a necessity. They may also irritate the skin and be flammable.

Fire can be another danger when working with plumbing. In areas where septic or waste lines are present, methane gas may accumulate. This gas is flammable and can explode. Another potential fire hazard occurs when using a propane torch to join copper pipe. The flame can cause a fire if it comes into contact with combustible materials, such as wood, paper, and clothing. Remember, if plumbing is being installed, water for fire protection may not be available.

Disorganized, untidy work sites can cause accidents. Tripping and falling are common causes of injuries. Small sections of pipe left lying around can be particularly hazardous, since they tend to roll when stepped on. Ladders, which are used to place pipes overhead or in walls, can tip over if they are not set on a level, solid surface.

Plumbing Careers

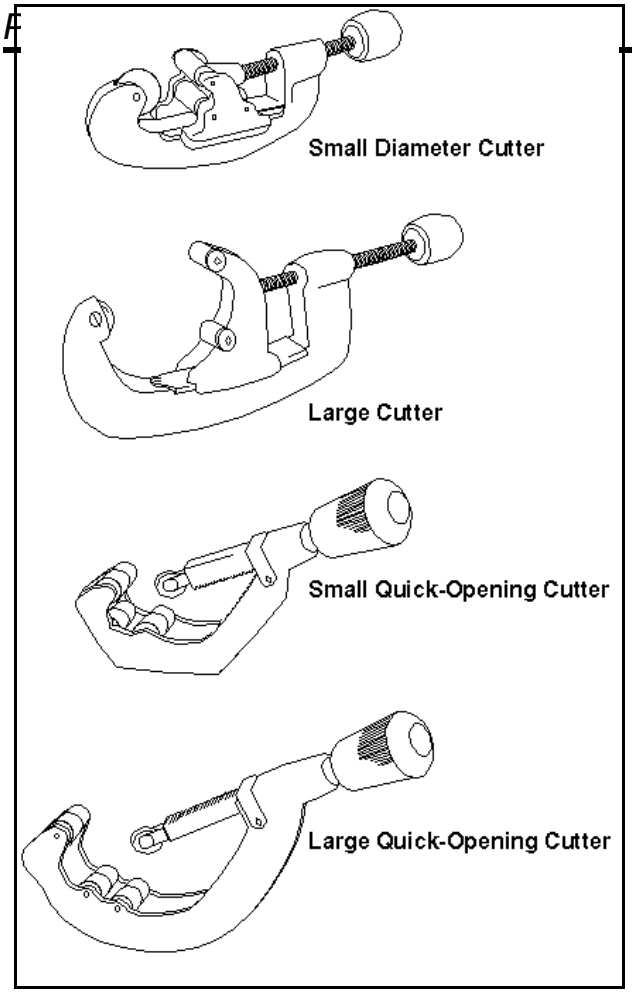
Plumber	Plumbing supply dealer
Plumbing retailer	Plumbing inspector
Plumbing educator	Well driller
Plumbing contractor	
Plumbing estimator	

Tools for Safe Plumbing Practices

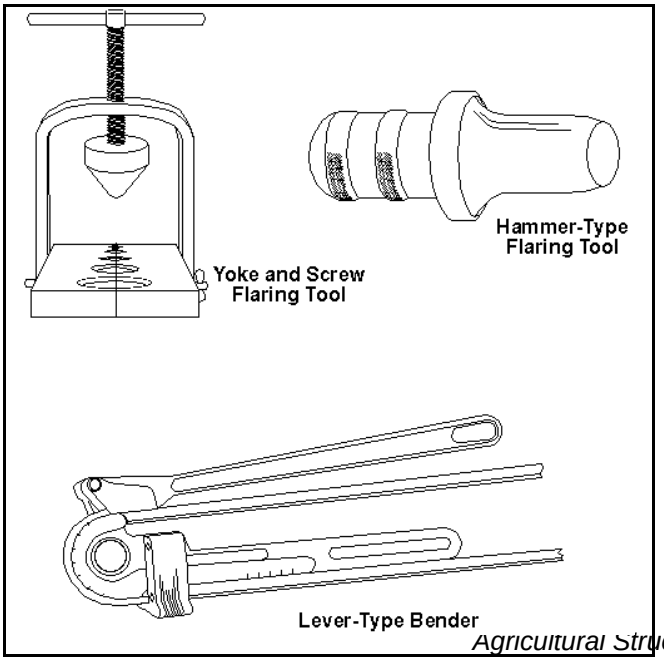
In the past, metal pipes, consisting of cast iron for drains and copper and galvanized steel for supply lines, were the industry standard. Tile was also a common material for drain lines or pipes. These materials may still be found in older structures, but, with the exception of copper lines (required by building codes under various conditions), they are not a popular choice for new construction. Plastic plumbing materials are much easier to work with and do not require the specialized tools that were necessary for working with their metal counterparts. Because of the decline in popularity of metal pipe, few people choose to invest in the tools necessary to work with it. These tools are quite costly and specialized in function, so they are simply not practical.

A few general tools are needed for plumbing practices. A shovel can be used to dig shallow trenches for pipe; for deeper trenches, heavy earthmoving equipment is necessary. Other tools needed when installing pipe are a level, a claw hammer for removing boards, a ladder, a tape measure, and a drill for drilling holes in walls to run pipes.

Working with plastic pipe requires some additional tools. They include a hacksaw for cutting pipe into smaller lengths and an adjustable wrench to hold plastic pipe fittings. Sandpaper, a knife, or a scraping tool is used to smooth the rough edges of pipe that has been cut, and pipe cleaner removes residue from cutting. Pipe glue is used to join pipes.



If copper pipes are necessary, special tools must be used. A propane torch and soldering material join pipes together. A pipe cutter cuts the pipe into lengths, while a pipe bender bends the pipe. A pipe reamer is used to remove sharp edges after cutting the pipe. A flaring tool is used to widen the end of the pipe. Some copper fittings are designed to seal using compression, requiring that one end of the pipe be widened to prevent the fitting from sliding off. Figure 2.1 shows some different types of pipe cutters. Figure 2.2 shows one kind of bender and different flaring tools.



Using Plumbing Tools Safely

Protective clothing and gear can greatly enhance personal safety while using the plumbing tools listed. A minimum of heavy work pants, boots, gloves, and eye protection is suggested. If injury from above is possible, a safety helmet may be needed.

Most plumbing tools are safe if used carefully. All tools should only be used according to the manufacturer's recommendations. When utilizing plastic pipe cleaners and cements, special attention should be given to any safety recommendations concerning ventilation, skin contact, or fire hazards. If working with plumbing involves soldering copper pipes, using a propane torch will probably be necessary. Extreme caution should be used when working with a torch; proper ventilation and the use of the protective clothing and gear listed above are a must.

Plumbing, like other construction activities, requires that people be alert and cautious to stay safe. Workers must stay focused on the task at hand as well as their surroundings to avoid injuring themselves or others.

Summary

Basic plumbing skills are necessary for constructing many types of agricultural structures. Being aware of any possible hazards is an important part of working with plumbing materials safely. Safety can also be maintained by becoming familiar with the tools needed and how to use them properly. By following these guidelines, the chances of an injury or accident occurring can be greatly reduced.

Credits

Annis, William H. *Basic Plumbing Skills*. Athens, Ga.: American Association for Vocational Instructional Materials (AAVIM), 1989.

Huth, Mark W. *Construction Technology.* 2nd ed. Albany, N.Y.: Delmar Publishers, 1989.