Virginia Cooperative Extension

PUBLICATION 420-090

Farm Tractor Logging for Woodlot Owners

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Farmers performing their own timber harvest on their woodlots is common in the Scandinavian countries. Using specialized logging attachments on modified farm tractors, they often log during the winter when their normal farming operations are suspended. Their total impact on the forest industry is substantialãpart-time logger/farmers produce nearly onethird ofthe wood utilized by Scandinavia's large lumber and paper industry. Loggingtheir own timber also provides Scandinavian farmers with additional income. The forest industry pays a higher price for wood piled at roadside than it does for standing timber. If the logger/farmer can log the wood to roadside with his farm tractor logging system for less cost than the increase he gains in price, he can profit from doing his own logging.

Although many American farmers own timberland, have farm tractors suitable for logging, and have a slack season during the winter, part-time farm tractor logging is not common in the United States. In some areas, the forest industry raw material supply infrastructure discourages wood produced by part-time farmer/loggers. Some forest products companies prefer to buy stumpage, or standing timber, from the forest landowner and have it logged to their specifications and delivered to their mill by a preferred group of professional full-time logging contractors. Through this arrangement, they maintain greater control over the quality, quantity, and scheduling of their raw material flow. However, there are areas where landowner-produced wood is welcomed. For example, a large paper mill in southwestem Alabama recently announced a special wood procurement program aimed at encouraging the production of pulpwood banked, or piled, at roadside by small-scale fammer/loggers for subsequent collection by paper company logging trucks.

Farmers considering part-time farm tractor logging may also have justifiable concen over the issue of safety. Logging is the single most dangerous occupation in the United States, according to Labor Department statistics. Logging accidents occur at a rate 2.5 times the average for all other industries, and a full-time logger has a better than 1 in 1,000 chance of getting killed on the job! Many farmers (and their wives) simply don't want to risk the accident and injury exposure that logging involves, and rightfully so. However, with professional training, extensive use of personal protective equipment (such as hard hat, saw chaps, and steel-toe boots) and a healthy respect for the dangers inherent in logging, a properly equipped farmer could develop a profitable part time farm tractor logging operation for use on his own forest land.

Small-scale farm tractor logging may also be used in certain cases to lessen the environmental impact of a timber harvesting operation. The smaller, lighter farm tractor may be able to operate effectively on partial cuts in dense timberstands where larger skidders or forwarders might possibly cause residual stand damage or soil compaction. A farm tractor logging system, with its relatively low capital investment and operating costs, may be an effective way to meet other non-timber landowner objectives that require logging small areas infrequently, like clearing wildlife plots or opening up recreation areas. Larger, full-time professional loggers with higher capital and operating costs often cannot afford to move their equipment for such small jobs. Finally, farm tractor logging can be a very effective system for producing firewood from the farm woodlot for personal consumption or commercial sale.

For a part-time owner/operator farm tractor logging venture to be successful, the following criteria should be met:

1. The farmer must own enough timber to justify the investment in training and equipment. As a rule of thumb, at least 40 acres of mature timber would be required. In addition, this timber must be located on

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Produced by Communications and Marketing, College of Agriculture and Life Sciences,
Virginia Polytechnic Institute and State University, 2009

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land suitable for logging with a farm tractor system - not too steep and rocky or too wet and swampy. It should have reasonably good access and be adjacent to a trafficable road where a log truck can travel to pick up the "banked" wood or logs.

2. The farmer must have a farm tractor suitable for modification to logging. To handle a full range of log sizes and species typical of many woodlots, the tractor should be a moderately powerful, 4-wheel drive model of at least 60 horsepower rating and a low center of gravity.

3. The farmer must be in top physical shape. Felling and bucking timber with a chainsaw is a highly strenuous physical activity. Working in the forest environment requires an alert individual not dulled by fatigue.

4. The farmer must be proficient in the use of a professional-quality chainsaw. Often referred to as "the most dangerous tool known to man," the chainsaw is also the most efficient way to manually fell, limb, and buck a tree. Under no circumstances should an individual inexperienced with a chainsaw attempt to begin a logging operation. "On-the-job training" is NOT an acceptable way to learn how to fell trees with a chainsaw! Professional training with an experienced chainsaw operator is a must! Many chainsaw manufacturers offer training programs, and chainsaw training videos are available from a variety of sources, including the Cooperative Extension Service. A few independent professional timber harvesting training companies also offer workshops on chainsaw use and safety. See the Appendix for a partial list of chainsaw training programs.

5. The farmer will be required to invest from $2,000 to $20,000 in farm tractor modification end attachments, professional training, chainsaw, personal protective equipment, logging chain, and other miscellaneous equipment and supplies.

6. The farmer must contract with a log truck owner to pick up the logs or pulpwood "banked" at roadside and deliver it to the sawmill or pulpwood yard. He must also contract with the mill for a "delivered" price for his wood or logs, based on the mill's raw material specifications and method of scale (volume or weight).

7. The farmer should be somewhat knowledgeable regarding forestry and the different types of cutting methods. Many harvesting alternatives are available to the forest landowner, and the best choice depends upon landowner objectives, desired species mix, regeneration goals, local timber markets, age and quality of the timberstand, forest health, and many other factors. Harvest cut alternatives range from single-tree selection (uneven-aged management favoring shade-tolerant species) to clearcuts (even-aged management favoring shadeintolerant species) to group selection, shelterwood, and thinning. Any landowner unfamiliar with basic forestry principles would be well advised to consult with a professional forester prior to undertaking any timber harvesting operation. Advice can be obtained from Virginia Department of Forestry service foresters or private forestry consultants.

8. The farmer must become familiar with the various laws and regulations affecting timber harvesting. For example, in Virginia, loggers should be familiar with and follow recommended Best Management Practices forlogging. These operational techniques will prevent stream sedimentation and site degradation from logging. A copy of the BMP Handbook for Logging is available free of charge at each county office of the Virginia Department of Forestry. OSHA logging safety standards; Virginia's seed-tree law; and various environmental, operational, and trucking regulations all affect a logging operation.

Two modified farm tractor logging systems are commonly used and available commercially in the United States. They are (1) a skidder system and (2) a forwarder system.

Using the Farm Tractor as a Skidder

In a skidder system, the trees are manually felled with a chainsaw. The logger then delimbs (cuts the limbs off flush with the bole) and tops (cuts off the bole of the tree near the top at the point where the tree's diameter falls below minimum merchantable size) the tree where it lies at the stump. Whenever possible, the trees should be directionally felled with the butts oriented toward the landing, or location to which the trees will be skidded. This will make the skidding job easier. After a few trees have been felled, delimbed, and topped, the logger moves his modified farm tractor skidder into position, sets the brake, pulls out the winch cable, attach es the chain or cable chokers to the butts of two or three trees, winches them in to the tractor, raises the ends up with the three point hitch, and skids the tree-length stems to the roadside landing. At roadside, he bucks the trees

(measures and cuts the tree-length stems into specified log lengths). After a full truckload of logs or pulpwood has been banked at roadside, a self-loading log truck (one with a hydraulic knuckle-boom loader mounted just behind the cab) picks them up and delivers the load of logs or pulpwood to the mill.

For a skidder logging application, the fann tractor should be modified as follows:

1. A steel skid plate, or belly-pan, should be welded under the tractor's motor, transmission and steering components. The belly-pan protects the tractor's underside and reduces the number of times it will hang up on a stump or rock. (Figure 1.)

Figure 1.

2. The tractor MUST be equipped with an OSHA-approved roll bar or protective cab.

3. \Radiator protection in the form of a steel grille guard, as well as engine side guards, is necessary.

4. 10-12 ply tires, with valve stem protection plates welded on the rim, may be advisable, especially in rougher terrain.

5. Tire chains may be necessary on the rear wheels when logging on soft ground or snow.

6. Counterweights on the tractor's front end to improve machine stability will be required for skidding.

7. A fire extinguisher should be carried in the tractor at all times.

8. A special logging winch is also required (Figure 1, see right). This logging winch is mounted on the tractor's three-point hitch and operates off the PIO. Over 20 firms, most of them in Scandinavia, manufacture logging winches for farm tractors. They are priced from $1,500 to $4,500. See the Appendix for a partial list of manufacturers. Use of the special logging winch allows skidding of multiple logs with the ends ofthe logs locked snugly against the winch frame and lifted off the ground by the three point hitch, eliminating hang-ups and reducing drag as the logs are pulled through the woods. Dragging logs with a farm tractor not equipped with a logging winch is very dangerous and inefficient and is not advised.

A skidder system is the most economical farm tractor logging system, requiring the minimum amount of additional investment. It is most efficient when the skidding distance from the stump to the roadside landing averages less than 500 feet.

Using the Farm Tractor as a Forwarder

With a farm-tractor forwarder logging system, the trees are also manually felled with a chainsaw. They are delimbed, topped, and bucked into log lengths at the stump. The logs are then loaded onto a logging trailer with a grapple loader mounted on a modified farm tractor. After loading the logs onto the logging trailer, the farm tractor pulls, or forwards, the trailer to the roadside landing. At the roadside landing, the operator offloads the logs from the logging trailer using the grapple loader either directly onto a log truck or stacks them in a pile for later pickup and delivery to the mill.

For use as a forwarder, a farm Tractor should be modified as follows:

1. Belly-pan, radiator protection grille, engine side guards, roll bar or protective cab, reinforced tires with valve stem guards, tire chains, counterweights, and fire extinguisher are all necessary modifications, whether using the farm tractor as a skidder or as a forwarder.

2. The tractor must be equipped with a hydraulic grapple loader (Figure 2). These units are usually mounted on the tractor's three-point hitch, although they can be mounted on the front of a powered logging trailer as well. Grapple loader attachments generally require a tractor hydraulic system with a flow rate of at least 5 gallons per minute (gpm). At least six manufacturers offer small grapple loader models suitable for use with a farm tractor (see Appendix for listing). They cost from $6,000 to $11,000. Boom attachments such

as trenching and loading buckets are available that can serve a variety of agricultural purposes when the unit is not being used for logging.

Figure 2.

A logging (forwarding) trailer (Figure 3) is also required in a forwarder logging system. The trailer can range from a common four-wheel flatbed utility farm trailer equipped with four temporary standards (upright poles to hold the logs on the trailer), to a PI O-powered, bogie-axle, specially designed logging/railer. The latter can cost from $2,000 to $5,000. A few manufacturers are listed in the Appendix.

Figure 3.

Obviously, using a farm tractor as a forwarder requires a larger investment in equipment than a farm tractor skidder system. Advantages of forwarder logging include a larger payload on each trip from stump to landing, less ground disturbance since the logs are being carried rather than skidded, the ability to stack and/or offload the logs directly on a truck at the landing, and the opportunity to use the grapple loader attachment as a versatile agricultural implement. For farmers with larger woodlots and long skid distances who plan to do considerable part/time logging and have their own log truck, a forwarder system may prove well worth the investment.

Part-time farm tractorlogging has not been common in the United States. However, as forest stewardship programs increase landowner awareness regarding the interrelationship of timber harvesting with wildlife and other multiple-use aspects of forest management, woodlot owners with a tractor and a chainsaw may see advantages in being able to do their own logging.

For additional information on logging, contact your local Virginia Department of Forestry area forester, Forestry Extension at Virginia Tech, or one of Virginia's 1,100 professional logging contractors. But remember, each and every workday, over 70 persons are injured on a logging job somewhere in this country. If you are going to log, get the proper training and equipment, and BE SAFE!

Appendix

A partial list of farm tractor logging winch manufacturers:

Pacific Winches
P.O. Box 164
Lynden, WA 98264

J & R Enterprises (Brumfield Farm Logger)
P.O. Box 97
Montesano, WA 98563

Les Equipments Hardy Ine. (Agri-Winch)
100 Rue St. Arthur Portneuf Station, Quebee
Canada

Nokka-Koneet (Nokka logging winch)
68600 Jakobstad
Finland

Orion Yhtyma Oy Normet (Farmi logging winch)
74510 Peltosalmi
Finland

Elkem - Spigerverket a/s (Norse logging winch)
Stal og Tau
3160 Stokke
Norway

Fransgard (Fransgard logging winch)
Fredberg, DK 9640 Farso
Denmark

A partial list of farm tractor grapple loader manufacturers:

Gafner Machine Inc. (L'il Gaf hydraulic grapple loader)
P.O. Box 401
Gladstone, MI

Nokka-Koneet (Nokka hydraulic grapple loader)
409500 Muurame
Finland

Orion Yhtyma Oy (Farmi hydraulic grapple loader)
Normet 74510 Peltosalmi,
Finland

Bercomac Ltee (Berco hydraulic grapple loader)
2815 chemin de l'Aeroport
Thetford Mines, Quebec
Canada

Les Equipments CAJEC Inc. (Cajec mini-loader)
222 2e Ave.
Lambton, Quebec
Canada

A parlial list of logging trailer manufacturers:

Kesla Oy (Patu logging trailer)
SF-59800 Kesalahti
Finland

Nokka-Koneet (Nokka logging trailer)
409500 Muurame
Finland

Orion Yhtyma Oy Normet (Farmi logging trailer).
74510 Peltosalmi
Finland

Bercomac Ltee (Berco logging trailer)
2815, chemin de l'Aeroport
Thetford Mines,
Quebec Canada

Les Equipments Inc. (GAJEC logging trailer)
222 2e Ave.
Lambton, Quebec
Canada

Harper Equipment Ltd. (Harper logging trailer)
Fredericton, New Brunswick
Canada

A. Lacasse Engineering (Lacasse logging trailer)
41 Route Abenakis
Ste. Clair, Quebec
Canada

A partial list of eastern U.S. distributors of farm tractor logging equipment:

Northeast Implement Corp.
P.O. Box 402
Spencer, NY 14883
607/589-6160

Woodlot Management Equipment Company
P.O. Box 455
Liberty, NC 27298
919/622-3375

A partial list of chainsaw safety and training program vendors:

Consumer Product Safety Commission (chainsaw safety publications)
Washington, DC 20207
(800)638-8326

Tilton Equipment Company (chainsaw training programs)
Box 68
Rye, NH 03870
Soren Eriksson Training, Inc. (chainsaw training programs)

9237 Ridge Rd.
Hiram, GA 30141
North Carolina Agricultural Extension Service (chainsaw safety and training videotape series) NC State University
Raleigh, NC 27612

Various chainsaw manufacturers (chainsaw safety videos and publications)

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