

MECHANICAL TREATMENTS FOR QUAIL HABITAT IMPROVEMENT

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What Types of Mechanical Treatments Are Available?

Mechanical treatments typically use some type of tractor and pull behind attachments (mower, disk, roller chopper). The size of mowers, disks and roller choppers vary, thus making the horsepower requirement of the tractor vary accordingly. If you are not familiar with gauging tractor horsepower requirements, I recommend you contact dealer representatives of the various implements to get this information. A web plow is a V-shaped blade that is typically positioned under a road grader and inserted into the ground about 6 to 8 inches deep, and is another type of mechanical treatment.

Why Use Mechanical Treatments?

While quail eat fruits of some woody plants (saw palmetto, blue berries), much of their diet consists of seeds and fruits of herbaceous plants (grasses, sedges, weeds and legumes) and on insects that are attracted to herbaceous plants. Prolific woody plant growth will compete for sunlight, water, and nutrients with herbaceous plants and limit their productivity. Mechanical treatments have been shown to reduce woody plant growth for varying periods of time and increase herbaceous plant growth. Plant responses to the soil disturbance following mechanical treatments are a major management objective. Mechanical treatments should not be used as a substitute for prescribed fire. Herbaceous plant growth and seed production will respond best to a combination of mechanical and fire treatments.

Do I Need To Use Mechanical Treatments On My Property?

The decision to use mechanical treatments should be based on the overall extent of woody shrub on you property. In south central Florida, the most common woody shrubs are saw palmetto (palmetto), gall berry, scrub oaks, and fetterbush. These shrubs occupy a midstory of canopy between ground cover of grasses and forbs below and typically pines above. On native range pastures where cover of woody plants exceeds 30-40%, mechanical treatments should be considered in addition to prescribed fire treatments.

What Does Roller Chopping Do To The Habitat?

A roller chopper is a metal drum that has a series of sharpened blades attached. These drums can be used singly or in a set of two, with one drum

positioned in front of the other and often oriented at an angle to one another. Water may be added to the drums to provide additional weight. As the drums are pulled along, the vegetation is both crushed and cut by the apparatus. Above and below ground portions of plants may be cut by the blades depending upon the physical structure of the vegetation. Drum choppers pulled over bare ground will turn the soil. Repeated passes of choppers over the same piece of ground, called double chopping, will result in additional cutting of the vegetation and additional disturbance to the soil.

Some woody plants may be killed by roller chopping but many will just be defoliated for several months until resprouting begins. Woody plant canopy cover can be reduced by about 40-60% for 3 to 5 years, depending upon species. The crushing effects will also reduce shrub height for several years. If your management objective is to remove most of the palmetto quickly (within a couple years), then you will need to retreat the site annually until the palmetto are root-killed. This level of treatment will result in severe soil disturbance, so potential problems of soil erosion should be considered when choosing the sites to receive palmetto removal. Some existing herbaceous plants may be killed where soil disturbance is high. On the other hand, most herbaceous plants, especially sod-forming species, will be stimulated to increase growth. Also, soil disturbance will promote germination of seeds lying dormant in the soil.

Roller choppers come in light (90-130 HP requirement), medium (150-200 HP requirement), and big (200-300 HP requirement) drum sizes and in several blade arrangements (solid straight bar and spiraled bar segments). Most saw palmetto "woods" pastures can be chopped with the medium-sized choppers. Land managers at Myakka River State Park have experienced increased reduction in palmetto cover and plant density with the spiraled chopper design.

What Does Mowing Do To Quail Habitat?

Mowing defoliates all vegetation small enough to be cut by the blades at the height set on the tractor; few, if any, woody plants are killed by this treatment. Importantly, almost no soil disturbance occurs, often resulting in reduced amounts of seed producing plants regenerating on the treated sites. Shrubs begin resprouting soon following treatment with recovery of their canopy cover within a year, although shrub height regrowth may take longer.

Given the high rpms of the mower blades, I expect maintenance costs of mowers would be more than for roller choppers or disks.

What Does Disking Do To Quail Habitat?

Disking can be used on relatively sparsely growing shrubs and low growing palmetto. However, much care would need to be taken not to damage the disks, especially if they were too small for the vegetation. Similarly, disking

can be used in large, monotypic areas of grass, to stimulate weed growth and diversify the plant community. Discing is mostly used for establishment and maintenance of fire lanes. Regardless of where disking is done, annual plants that produce seeds and some perennial grasses with high seed productivity, such as low panicums, and many weeds regenerate in disked areas, providing excellent foraging areas for adult quail and bugging areas for their chicks.

What Does Web Plowing Do To Quail Habitat?

Web plowing is more effective in root-killing palmetto than roller chopping. The V-shaped blade runs parallel to the soil surface and severs palmetto rhizomes and roots. Disturbance to the soil surface is not severe, so stimulation of herbaceous species growth is not as pronounced as with roller chopping or disking.

What Time Of Year Should I Use Mechanical Treatments?

Avoid treating large areas in March, April, May and June if at all possible. Ground nesting birds, including quail, nest during this time. If you must treat during nesting season, leave patches of untreated vegetation (size and shape to be discussed later) as many of the birds will reneest. It is important to have good soil moisture conditions at the time of treatment. Research has shown poor reduction of shrub cover when roller chopping was done during a drought. Excessive rainfall immediately following roller chopping may cause a 2 to 3 month delay in regrowth of herbaceous vegetation.

Use prescribed fire in advance of using mechanical treatments so that tree stumps can be avoided. Striking tree stumps can be very damaging to the equipment and to the operator. Marking stump locations with a section of PVC pipe also will reduce the probability of striking them with your equipment in the situation where you cannot mechanically treat burned sites before vegetation regrowth.

Soil disturbance resulting from mechanical treatments during different seasons of the year will affect the types of plant species reestablishing in the disturbed areas. Some experimentation on your own property may be needed to determine the time of year you need to disk to provide the best composition of seed and insect producing plants.

How Often Should I Use Mechanical Treatments?

Research indicates Florida's pine/palmetto flatwoods habitats should be roller chopped on a 6-year cycle (and burned at least on a 3-year cycle for quail). Although there are no studies on shrub responses to disking, a similar return interval to chopping should work. Fire lanes should be disked prior to prescribed burning and possibly more often to stimulate seed production from annual plant

species. Mowing will occur mostly in grassy areas and the frequency will be related to the rapidity of shrub encroachment and growth.

What Is the Best Spatial Pattern For Mechanical Treatments?

Since the home range of a quail is relatively small (30-40 acres) and they need a variety of cover types (grassy-weedy areas for bugs and seeds, mixed weeds and shrubs with bare ground for scratching seeds from the soil and protection from aerial predators, and heavier shrubs/trees for winter refuge), size and physical arrangement of habitat patches is very important. About 25 % of a pasture should not receive any mechanical treatments. However, through time, some of these untreated patches may be mechanically treated when woody plant growth on previously-treated patches recovers and can be protected. Patch arrangement will vary from pasture to pasture as land forms vary. For example, flatwoods ponds often occupy 10-15% of the land area, and their borders should be protected from mechanical treatments to provide cover for most wildlife.

Strip or checker-board patterns may be used. Treated strips of about 200 feet wide separated by 60 feet of untreated shrubs are a suggestion. A checkerboard pattern of alternating treated and untreated strips will result in blocks of land receiving no treatment, single mechanical treatment and double mechanical treatment. Again, treatment strips should be about 200 feet wide.

How Much Do Mechanical Treatments Cost?

Cost of contracting mechanical treatments can vary according to total area of treatment, complexity of treatment pattern, and ever escalating fuel prices. For summer 2005, cost of roller chopping and disking range from \$40 to \$65/acre. Mowing cost per acre should be somewhat less. To obtain prices of purchasing your own equipment, please contact your local distributors or manufactures for up-to-date prices. Web plows typically require a road grader (there were some pull behind versions made in the past), and their availability is limited. While web plowing is very efficient at killing palmetto, the per acre costs probably are quite high in comparison to other mechanical treatments.

