# Moist-soil Management for Waterfowl

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Moist-soil management is the manipulation of water, seed banks, and soil to promote germination of desirable wetland plants for waterfowl. For the purposes of this article, we will define desirable moist-soil plants as those plants that provide seeds, tubers, or leaves for waterfowl and other wildlife to consume. As with other wildlife management practices, moist-soil management is both an art and a science. The art comes from each site seeming to be a little different than the next and sometimes, when Mother Nature throws a curve ball, you must quickly adapt to hit a home run. The science comes from decades of research supporting moist-soil management practices that are most beneficial to waterfowl and other wildlife.

Moist-soil management for waterfowl originated from early research conducted by the legendary Dr. Frank Bellrose in the Illinois River Valley, and has proven highly successful in other regions important for wintering waterfowl, including southeast Missouri, California's Central Valley, and the Playa Lakes of Texas. Although it is sometimes difficult to convince folks that growing "weeds" in their duck holes is a good idea, these weeds are a critical component in the waterfowl habitat complex. Moist-soil habitats provide high-energy seeds and good habitat for aquatic invertebrates which provide energy and nutrients for waterfowl throughout the fall and winter. Conversely, most conventionally-grown agricultural crops only provide waterfowl with foods that are high in carbohydrates. While these high-carbohydrate foods are extremely important to wintering waterfowl, ducks also need these additional nutrients and proteins found in moist-soil plants and invertebrates to thrive during winter and return to the breeding grounds in good condition. Just as importantly, ducks key into moist-soil habitats during certain times of winter, and without this important component of the waterfowl habitat complex on your property, you may be left staring at empty skies while the guy with the weeds is shooting ducks.

Successful moist-soil management typically occurs in wetlands that have a water control structure capable of manipulating water levels in increments (i.e., a flash board riser). However, moist-soil management may also occur in natural basins without a water control structure (e.g., beaver wetlands) if they dry naturally during summer and can be regularly accessed with a tractor and disk. Presence or absence of desirable weeds depends heavily on timing of the drawdown, plant successional stage, seed bank, and weather. Timing of drawdown is generally divided into early-, mid-, and late-season time frames. In Mississippi, an early season drawdown occurs during the first 45 days of the growing season (March 15 – May 1), a mid-season drawdown occurs during the next 45 days of the growing season (May 1 – July 15), and a late-season drawdown occurs after July 15. A slow, early to mid-season drawdown typically produces the greatest diversity and quantity of seeds. However, mid- to late-season drawdowns will often favor the most desirable grasses and sedges. The key to successful moist-soil management is to hold water in a wetland until the growing season starts and the danger of a frost has passed. If a wetland is drained too early, it can be quite difficult to get any desirable wetland plants. Typically, we recommend beginning a drawdown in mid-April that will end in early May until we find out what works best for a particular property. If multiple wetlands are available on a property, we recommend a combination of early-, mid-, and late-season drawdowns to provide a diverse suite of waterfowl foods.

As in other habitats such as grasslands and forests, wetland plant communities change through time; this change is what biologists call "plant succession". Wetlands in early stages of plant succession are dominated by annual plants that produce many seeds (i.e. grasses), while wetlands in late stages of succession are dominated by perennial plants that typically do not produce many seeds. Thus, when managing for waterfowl foods, an early successional plant community is highly desirable, but must be maintained by disking every 2-3 years. These desirable annual plants are already present in the soil's seed bank; they just need a soil disturbance to be stimulated to grow. Waterfowl habitat managers have many opinions on when and how to disk. Disking during spring causes a manager to be entirely dependent on rainfall or irrigation to create the mudflats needed for moist-soil plant germination. If spring

disking is planned, water should be drained in early March so there will be sufficient time for the soils to be dry enough to disk, and so that early spring rains and mild temperatures will encourage desirable moist-soil plant germination after disking. Furthermore, effective spring disking requires breaking up the soil until the seedbed is smooth and finely textured, as soil full of clods will likely result in a wetland full of undesirable plants like coffeeweed and cocklebur. We do not recommend disking in the heat of summer, as this will also likely result in an undesirable plant community unless disking is followed with an irrigation or timely rain.

Disking during fall will promote a good diversity of moist-soil plants when the water is drained during the following spring, but may reduce the amount of food available during fall and winter. Once beneficial waterfowl foods may be readily identified, target disking in areas dominated by undesirable plants. Disking these poor areas will promote a good moist-soil plant response the following year and will also conserve existing waterfowl foods. Soils may be left more coarsely disked during fall than during spring, as winter flooding will reduce the soils into a mudflat over the course of the winter. Seek to disk about one-third of the wetland every year in a patchy mosaic pattern. Some disking each year will conserve waterfowl foods, reduce rank vegetation to improve waterfowl access early in the fall, and promote a diversity of moist-soil plants within an impoundment. Additionally, fall disking is an excellent strategy in wetland areas that do not dry until late summer or early fall.

Just as the duck migration varies according to annual weather patterns, so does the response of moist-soil plants. Weather patterns that are drier, wetter, colder, or hotter than the previous year may cause large-scale shifts in plant communities. To reduce these large shifts in plant communities, we recommend a slow drawdown over the course of two to six weeks. A slow drawdown will produce a diversity of desirable plants each year, because not all mudflats are exposed at the same time. Conversely, if the entire wetland is drained at the same time, a similar plant community (i.e. a monoculture) occurs across much of the impoundment. In some years, a rapid draw down may produce excellent results, but as is usually the case, when a cold front or other sudden weather event hits, it will produce an impoundment dominated by undesirable plants. Thus, vegetation identification and monitoring becomes very important soon after completion of a drawdown. Depending on the resulting vegetation response, effective management actions (i.e., disking, herbicide, and mowing) will vary.

Another benefit of moist-soil management is it allows for a fall flooding strategy that is not possible for many agricultural crops. In an ideal situation, a moist-soil wetland should be flooded from 5%-10% of capacity from mid-August until early November. Flooding should increase to about 25% of the wetland's capacity by mid- to late November. From late November to mid-December, 50%-75% of the wetland should be flooded and the wetland should be completely flooded by late December or mid-January. This strategy provides some wetland habitat for early migrants and constantly exposes new food resources throughout the winter. Many agricultural crops are not ready to be flooded by the time early-season migrants start filtering through Mississippi. Furthermore, most agricultural crops break down fairly rapidly once flooded whereas moist-soil seeds do not. This flooding strategy will provide hunting opportunities from early teal season to the last day of duck season.

It is important to remember that moist-soil management is not a silver bullet that will produce a full strap of ducks on every hunt, but it is certainly a key part of a complete waterfowl habitat management plan. The keys to successful moist-soil management are developing a plan, recording notes and observations on drawdown times, plant responses, herbicide applications, disking schedules, wildlife use, and flood timing. If you are interested in moist-soil management and other waterfowl habitat management assistance, please contact a MDWFP Waterfowl Program biologist or Private Lands Habitat Program biologist.

Moist-soil vegetation on Trim Cane WMA.


Barnyardgrass is a preferred moist-soil plant for waterfowl.

Sprangletop is a high seed producing moist-soil plant that can be attained with a late season drawdown.