CHEMICALS FOR TREATMENT OF PARASITES AND FISH DISEASES

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Trade names are provided for example purposes only. Trade name lists are not exhaustive and are not endorsements. Recommendations should be made based on active ingredients.

ACTIVE INGREDIENT	TRADE NAME EXAMPLES	USE CASES	PRODUCT APPLICATION RATE	RESTRICTIONS	SPECIAL CONSIDERATIONS
Formalin	Parasite-S	• Control of external parasites on all finfish	• **Tanks and raceways** 170–250 ppm • **Earthen ponds** 15–25 ppm	None	Always check water temperature before applying and follow treatment instructions accordingly.
Chloramine-T	Halamid® Aqua	• **Freshwater Salmonids** Control of mortality due to bacterial gill disease • **Walleye and freshwater warm water finfish** Control of mortality due to columnaris	• **Freshwater Salmonids** 12–20 ppm • **Walleye** 10–20 ppm • **Freshwater warmwater finfish** Up to 20 ppm	None	Immersion treatments only. Make sure the system can be flush after application. Bypass biofilter in recirculating systems.
Ormetropin + Sulfadimethoxine	Romet® 30	• **Salmonids** Control of furunculosis • **Catfish** Control of enteric septicemia	• **Medicated feed** 7.6 g per 100 lbs. of fish body weight per day	• 3-day withdrawal period for catfish. • 42-day withdrawal period for Salmonids.	**Restricted to use by or on the order of a licensed veterinarian.**
Tricaine metanesulfonate	Tricaine-S Syncaine®	• General anesthetic or euthanasia of fish	• Application rates are species specific and highly variable. Check label for further information on specific rates.	• 21-day withdrawal period.	Use in fish intended for consumption should be restricted to Ictaluridae, Salmonidae, Esocidae, and Percidae. Water temperatures should exceed 50°F.
Oxytetracycline	Terramycin® 200 for Fish	• **Salmonids** Control of mortality due to ulcer disease, furunculosis, bacterial hemorrhagic septicemia, columnaris, and pseudomonas disease • **Catfish** Control of bacterial hemorrhagic septicemia	• **Medicated feed** 2.5–3.75 g per 100 lbs. of fish body weight per day for 10 consecutive days. Rate depends on species. Check label for further information.	• 21-day withdrawal period for Salmonids and Catfish.	**Restricted to use by or on the order of a licensed veterinarian.**
Florfenicol	Aquaflor®	• **Freshwater Salmonids** Control of mortality due to furunculosis and coldwater disease • **Freshwater finfish** Control of mortality due to columnaris disease	• **Medicated feed** 10–15 mg/kg of fish body weight per day for 10 consecutive days.	• 15-day withdrawal period.	**Restricted to use by or on the order of a licensed veterinarian.**

1. Adapted from Approved Drugs for use in Aquaculture, 2010. US Fish and Wildlife Service, Aquatic Animal Drug Approval Partnership Program, American Fisheries Society Fish Culture Section, and US Food and Drug Administration Center for Veterinary Medicine.

ACTIVE INGREDIENT	TRADE NAME EXAMPLES	USE CASES	PRODUCT APPLICATION RATE	RESTRICTIONS	SPECIAL CONSIDERATIONS
Hydrogen Peroxide	Perox-aid ®	• **Freshwater Salmonids** Control of *Gyrodactylus* spp. and mortality due to bacterial gill disease • **Freshwater finfish** Control of mortality due to saprolegniasis and columnaris disease	• 50–100 ppm for 30–60 minutes per day. Check label for further information on specific rates.	None	Immersion treatments only. Make sure the system can be flushed after application. Bypass biofilter in recirculating systems.
Rotenone	Prenfish™ Fish Toxicant	• Piscicide	• **Normal use** 0.5–1.0 ppm • **Tolerant Species** 1.0–3.0 ppm • **Tolerant Species in Organic Ponds** 2.0–4.0 ppm	• Do not consume dead fish post-treatment • Do not enter the water during treatment	**Rotenone is a restricted use pesticide and may only be applied by certified applicators.**
Calcium hypochlorite		• Use as a disinfectant for aquaculture facility equipment	• 10 ppm available chlorine	None	Kills fish and some parasites. Remove fish from systems before treatment.
Hydrated Lime (Calcium Hydroxide)		• Use as a pond sterilizer for cleaning fishponds before restocking	• 500 pounds per acre	None	Kills most fish. Remove fish from systems before treatment. Use on a damp pond bottom without standing water.
Potassium Permanganate		• Use as a disinfectant for ponds or aquaculture facilities	• Pond application 2 ppm • **10-minute tank treatment** 10 ppm	None	Can be harmful to fish and algae. May cause oxygen depletion.
Sodium Chloride (Salt)	Fish Haul-C	• Reduces stress in fish. Use as a fish hauling aid.	• Treatment rates can vary. Check label on product.	None	Do not use iodized salt.

1. Adapted from Approved Drugs for use in Aquaculture, 2010. US Fish and Wildlife Service, Aquatic Animal Drug Approval Partnership Program, American Fisheries Society Fish Culture Section, and US Food and Drug Administration Center for Veterinary Medicine.

HERBICIDES FOR AQUATIC VEGETATION CONTROL

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ACTIVE INGREDIENT	TRADE NAME EXAMPLES	GENERAL USE CASES	PRODUCT APPLICATION RATE	SPECIAL CONSIDERATIIONS
Copper Sulfate	Crystal Blue Copper Sulfate Smart Crystals	• Algae • Macroalgae	• Application rates are variable depending on species and range from 0.25–2.0 ppm. • Check product label for further information on specific rates.	• Copper sulfate can be toxic to fish at high concentrations and in low alkalinity water. Test alkalinity and carefully perform treatment calculations prior to use.
Chelated Copper Compounds	Cutrine®-Plus K-Tea® Captain Nautique® Argos®	• Planktonic algae • Filamentous algae • Macroalgae	• Application rates are variable depending on species and density of growth and range from 0.2-1.0 ppm. • Check product label for further information on specific rates.	• Less toxic than copper sulfate. • Can be mixed with Diquat and/or Flumioxazin to increase effectiveness against resistant algae.
	Cutrine®-Ultra	• Planktonic algae • Filamentous algae • Macroalgae	• Application rates are variable depending on species and density of growth and range from 0.2–1.0 ppm. • Check product label for further information on specific rates.	• Stronger formulation than Cutrine®-Plus. • Includes a surfactant for penetrating algal mats.
Diquat	Alligare Diquat herbicide Reward® Weedtrine®-D	• Filamentous algae • Floating weeds • Submersed weeds	• Application rates are variable depending on water depth and density of growth and range from 0.25–2.0 gallons per surface acre. • Check product label for further information on specific rates.	• Diquat binds with sediment particles very quickly, so is ineffective in turbid water. • Can be mixed with copper products to increase effectiveness against certain types of algae.
Endothall	Hydrothol® 191 granular	• Submersed weeds	• Application rates are variable depending on species and density of growth and range from 0.3-1.5 ppm. • Check product label for further information on specific rates.	• Endothall is toxic to fish at high enough concentrations. • The manufacturer recommends this product be applied by commercial applicators on small portions of waterbodies.
	Aquathol® Super K granular Aquathol® K liquid Aquastrike® (Formulation includes Endothall and Diquat)	• Submersed weeds	• Application rates are variable depending on species and density of growth and range from 0.75-5.0 ppm. • Check product label for further information on specific rates.	• Endothall is toxic to fish at high enough concentrations. • The manufacturer recommends this product be applied by commercial applicators on small portions of waterbodies.
Flumioxazin	Clipper® Flumigard® SC	• Filamentous algae • Floating weeds • Emergent weeds • Submersed weeds	• **Water Depth < 3 feet** 6 ounces per acre • **Water Depth > 3 feet** 12 ounces per acre	• Flumioxazin is ineffective in water with a pH greater than 8.5. • Certain adjuvants can be used to adjust pH. • Disperse in 50-100 gal/A • A sinking adjuvant may be necessary in applications to deeper water
Fluridone	Sonar® Alligare Fluridone (**Formulations of these herbicides include granular, slow-release, liquid, and ready-to-us**e).	• Floating weeds • Submersed weeds	• Application rates are variable depending on formulation. • Check product label for further information on specific rates.	• Requires long contact time. Residence time should be considered before use. • Effective for whole-pond treatments.

ACTIVE INGREDIENT	TRADE NAME EXAMPLES	GENERAL USE CASES	PRODUCT APPLICATION RATE	SPECIAL CONSIDERATIIONS
2, 4-D	**Granular Formulations** Navigate® Renovate® Max G (Includes Triclopyr)	• Floating weeds • Emergent weeds	• •Application rates are variable depending on water depth and range from 0.25-5.0 ppm. • Check product label for further information on specific rates.	• Use granular formulations to treat deep root and rhizome systems of emergent weeds.
	Liquid Formulations Weedar® 64 AquaSweep® (Includes Triclopyr)	• Emergent weeds • Submerged weeds • Water Hyacinth	• Application rates are variable depending on water depth and range from 2.0-4.0 ppm. • Check product label for further information on specific rates.	
Glyphosate	AquaNeat® RefugeTM Alligare Glyphosate 5.4 Rodeo®	• Emergent weeds	• Application rates are variable depending on formulation. • Check product label for further information on specific rates.	• There are many formulations of Glyphosate for aquatic and terrestrial applications. Ensure that the formulation used is labeled for aquatic use.
Imazapyr	Clearcast® Imox® Habitat® Arsenal® Polaris®	• Emergent	• Application rates are variable depending on formulation. • Check product label for further information on specific rates.	• Mix the directed amount of herbicide in 100 gallons of water per acre to improve coverage.
Imazamox	Clearcast® Imox®	• Water Hyancinth and Salvinia • Emergent weeds • Some submersed weeds	• Application rates are variable depending on species and water depth. • Check product label for further information on specific rates.	
Carfentrazone	Stingray®	• Select floating, emergent, and submersed weeds. Check label.	• Application rates are variable depending on the species. • Check product label for further information on specific rates.	• May be mixed with other herbicides to control plants not listed on product label.
Triclopyr	Renovate® 3	• Select floating, emergent, and submersed weeds. Check label.	• Application rates are variable depending on water depth and range from 0.75-2.5 ppm. • Check product label for further information on specific rates.	
Bispyribac	Oasis® Tradewind™	• Select floating, emergent, and submersed weeds. Check label.	• Application rates are variable depending on water depth and density of growth and range from 20-45 ppb. • Check product label for further information on specific rates.	• Requires long contact times to be effective. Use in static water.
Topramezone	Oasis®	• Select floating, emergent, and submersed weeds. Check label.	• Application rates are variable depending on water depth and density of growth and range from 5-50 ppb. • Check product label for further information on specific rates.	• Requires long contact times to be effective. Use in static water.
Penoxsulam	Galleon® SC	• Select floating, emergent, and submersed weeds. Check label.	• Application rates are variable depending on water depth and density of growth and range from 5-150 ppb. • Check product label for further information on specific rates.	

HERBICIDES FOR AQUATIC VEGETATION CONTROL

ACTIVE INGREDIENT	TRADE NAME EXAMPLES	GENERAL USE CASES	PRODUCT APPLICATION RATE	SPECIAL CONSIDERATIIONS
Florpyrauxyfen-benzyl	ProcellaCor® EC ProcellaCor® SC	• Select floating, emergent, and submersed weeds. Check label.	• Applications rates are in prescription dose units (PDUs), which are equal to 3.17 fl. oz. of product. PDU application rates are dependent on the species and the percent of the waterbody to be treated.	• **ProcellaCor requires training from SePro corporation as a specialist before users can purchase or use this product.**
Sodium Carbonate Peroxyhydrate	PAK® 27 GreenClean® Phycomycin®	• Algae	• Application rates are highly variable. Check product label for further information on specific rates.	
Dyes and Colorants	Aquashade® Crystal Blue® Blue Vail™	• Colors water to shade sunlight from the water column and control algae and submersed weeds.	• Application rates are highly variable. Check product label for further information on specific rates.	• Disrupts growth of healthy algal blooms that form the base of a pond food chain. • Not a good option when fish growth is an objective.

RESPONSE OF COMMON AQUATIC WEEDS TO HERBICIDES[1]

GROUP	WEED	COPPER	2,4-D	DIQUAT	ENDOTHALL	FLUMIOXAZIN	FLURIDONE	GLYPHOSATE	CARFENTRAZONE	TRICLOPYR	IMAZAPYR	IMAZAMOX	PENOXSULAM
Algae	Planktonic	E	P	P	G	G	P	P	NR		NR	NR	
	Filamentous	E	P	E	G	E	P	P	NR		NR	NR	
	Chara	E	P	G	G	F	P	P	NR		NR	NR	
	Nitella	E	P	G	G	F	P	P	NR		NR	NR	
Floating Weeds	Bladderwort	P	G	E		E	E				NR	G	G
	Duckweeds	P	P	G	P	E	E	G	G	P	G		E
	Salvinia	G	P	G	P	E	E	G	G	P	P	E	E
	Water Fern			G		E	E		G				E
	Water Hyacinth	P	E	E		P	P	F	G	E	G	E	E
	Watermeal	P	P	P		E	G	P	P		NR		G
Emersed Weeds	Alders	P	E	F	P		P	E				G	
	Alligatorweed	P	F	P	P	E	G	E	F	G	G	E	
	American lotus	P	E	P	P		F	G		G	G	G	G
	Arrowhead	P	E	G	G	G	NR	E				G	
	Buttonbush	P	E	F	P	G	P	G			G	G	
	Cattails	P	G	G	P		F	E		F	E	E	
	Floating Heart		E		G		E	G		E		G	G
	Fragant and White Waterlily	P	E	P	P	F	E	E		G	E	E	G
	Frogbit	P	E	E		E				E	E	E	
	Maidencane	P	P	F			F	E					
	Pickerelweed	P	G	G			P	F			E	E	
	Sedges and Rushes	P	F	F	P	P	P	G			G	G	G
	Slender Spikerush	P	P	G		G	G	P				G	
	Smartweed	P	E	F		P	F	E		E	E	E	G
	Spatterdock	P	E	P	G		E	E		E	E	E	G
	Southern Watergrass	P	P	P	P		G	E			E		

RESPONSE OF COMMON AQUATIC WEEDS TO HERBICIDES

GROUP	WEED	Copper	2,4-D	DIQUAT	ENDOTHALL	FLUMIOXAZIN	FLURIDONE	GLYPHOSATE	CARFENTRAZONE	TRICLOPYR	IMAZAPYR	IMAZAMOX	PENOXSULAM
Emersed Weeds (*continued*)	Torpedograss	P	P	P			F	G		P	E	E	
	Waterhyssop			G	G		G				G		
	Watershield	P	E	P	P	G	G	G			P	E	
	Water Taro		G							G			
	Water Pennywort	P	G	G	P	E	P	G		G	E		G
	Water Primose	P	E	F	P	G	F	E	F	E	E	E	
	Water Willow	P	E	F	P		P	E		E	E	G	
Sub-mersed Weeds	Variable-leaf Watermilfoil	P	G	E	E	E	E	P	E	G	NR	G	E
	Coontail	P	P	G	F	E	E	P			NR	G	
	Egeria	P	P	E	F	E	E	P			NR		G
	Elodea	P	E	E	E	E	E	P		E	NR		G
	Eurasian Watermilfoil	P	F	G	E	E	E	P	G	E	NR	G	E
	Fanwort	F	P	G	G	E	E	P			NR		G
	Hydrilla	P	F	E	E	E	E	P			NR	G	E
	Naiads	P	E	E	E	F	F	F		E	NR		G
	Parrotfeather	F	E	E	E	E	E	NR		E	G*	G	G
	Pondweed	P	P	G	E	E	E	P	NR		G*	G	G
	Eelgrass	NR	NR	F	F	NR	NR	NR	NR		NR	NR	
	Widgeon Grass	E		G								G	

*Imazapyr is not labelled for application to submerged weeds, but it is labelled for a draw down application. It should be noted that there is a 120-day irrigation restriction on imazapyr. For questions, contact your local county extension agent.

1. E—excellent control (90–100%)
   G—good control (80–89%)
   F—fair control (70–79%)
   P—poor control (<70%)

NR—Not recommended
— Insufficient data
A blank space indicates weed response is not known.

AQUATIC VEGETATION CONTROL POST-TREATMENT WATER USE RESTRICTIONS

(NUMBER OF DAYS AFTER TREATMENT UNTIL WATER IS SUITABLE FOR SPECIFIC USE)

Post-treatment water use restrictions often depend on treatment rate and are shown as a day range in this table. Check product labels for restrictions specific to the applicable treatment rate.

		HUMAN			LIVESTOCK WATERING		IRRIGATION		AG. SPRAYS
ACTIVE INGREDIENT	TRADE NAME EXAMPLES	DRINKING	SWIMMING	FISH CONSUMPTION	DAIRY	LIVESTOCK	TURFGRASS	ROW CROPS	
Copper Sulfate	Crystal Blue Copper Sulfate Smart Crystals	0	0	0	0	0	0	0	0
Chelated Copper	Cutrine®-Plus	0	0	0	0	0	0	0	0
	K-Tea®	0	0	0	0	0	0	0	0
	Captain	0	0	0	0	0	0	0	0
	Nautique®	0	0	0	0	0	0	0	0
	Argos®	0	0	0	0	0	0	0	0
Diquat	Alligare Diquat Herbicide	1–3	0	0	1	1	1–3	5	5
	Reward®	1–3	0	0	1	1	1–3	5	5
	Weedtrine®-D	1–3	0	0	1	1	1–3	5	5
Endothall	Hydrothol® 191 granular	7–25	0	0	7–25	7–25	7	7	7
	Aquathol® Super K granular	7–25	0	0	7–25	7–25	7	7	7
	Aquathol® K liquid	7–25	0	0	7–25	7–25	7	7	7
	Aquastrike®	1–3	0	0	7–14	7–14	1–3	5	5
Flumioxazin	Clipper®	0	0	0	0	0	1–3	5	5
	Flumigard® SC	0	0	0	0	0	1–3	5	5
Fluridone	Sonar®	0	0	0	0	0	7–30	7–30	7–30
	Alligare Fluridone	0	0	0	0	0	7–30	7–30	7–30
2, 4-D	Navigate®	21	1	0	0	0	0–7[1]	0–7[1]	0–7[1]
	Renovate® Max G	21	0	0	0	0	0–120[2]	0–120[2]	0–120[2]
	Weedar® 64	21	1	0	0	0	0–7[1]	0–7[1]	0–7[1]
	AquaSweep®	21	0	0	0	0	0–120[2]	0–120[2]	0–120[2]
Glyphosate	AquaNeat®	0	0	0	0	0	0	0	0
	RefugeTM	0	0	0	0	0	0	0	0
	Alligare Glyphosate 5.4	0	0	0	0	0	0	0	0
	Rodeo®	0	0	0	0	0	0	0	0
Imazapyr	Habitat®	½ mile[3]	0	0	0	0	120	120	0
	Arsenal®	½ mile[3]	0	0	0	0	120	120	0
	Polaris®	½ mile[3]	0	0	0	0	120	120	0
Imazamox	Clearcast®	<50 ppb	0	0	0	0	<50 ppb	<50 ppb	0
	Imox®	<50 ppb	0	0	0	0	<50 ppb	<50 ppb	0

AQUATIC VEGETATION CONTROL POST-TREATMENT WATER USE RESTRICTIONS

ACTIVE INGREDIENT	TRADE NAME EXAMPLES	HUMAN			LIVESTOCK WATERING		IRRIGATION		AG. SPRAYS
		DRINKING	SWIMMING	FISH CONSUMPTION	DAIRY	LIVESTOCK	TURFGRASS	ROW CROPS	
Triclopyr	Renovate®	<0.4 ppm	0	0	0	0	120	120	0
Carfentrazone	Stingray®	0–1	0	0	0-1	0-1	0–14	0–14	0–14
Bispyribac	Tradewind™	0	0	0	0	0	<1 ppb	<1 ppb	<1 ppb
Topramezone	Oasis®	<45 ppb	<50 ppb	<50 ppb	<50 ppb	<50 ppb	<1 ppb	<1 ppb	<1 ppb
Penoxsulam	Galleon® SC	0.1 ppm	0	0	0	0	<1 ppb	<1 ppb	<1 ppb
Florpyrauxyfen-benzyl	ProcellaCor®	See label[4]	0	0	See label[4]	See label[4]	See label[4]	See label[4]	See label[4]

1. If the crop area is labeled for direct treatment with 2,4–D, the water may be used for irrigation or mixing sprays at any time following treatment. If the crop area is not labeled for direct treatment with 2,4–D the water should not be used for irrigation or mixing sprays until 7 days after treatment.
2. If the crop area is labeled for direct treatment with Triclopyr and 2,4–D, the water may be used for irrigation or mixing sprays at any time following treatment. If the crop area is not labeled for direct treatment with Triclopyr and 2,4–D the water should not be used for irrigation or mixing sprays until 120 days after treatment.
3. Imazapyr cannot be applied less than ½ mile from a potable water intake.
4. ProcellaCor post-treatment water use restrictions are specific to the number of prescription dose units needed for treatment. See the product label for specific use restrictions.

CALCULATING PESTICIDE CONCENTRATIONS IN AQUATIC SITUATIONS[1]

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Depending on the chemical, pesticides are applied as a surface acre, bottom acre-foot, or total water volume treatment. Total water volume treatments are expressed on a part per million by weight (ppmw) basis. Water volume can be measured in gallons, cubic yards, cubic feet, etc.; however, the most commonly used unit of water volume measurement is acre-feet. The following formula may be used to determine the amount of pesticide formulation required to obtain a desired final concentration (ppmw) in the water of a pond or lake on an acre-feet basis:

1. Concentration based on part per million by weight (ppmw)

$$\text{Amount of formulation} = \frac{A \times D \times CF \times ECC}{I}$$

A = area of the water surface in acres (Use precise measurement or measure from aerial photos).

D = average depth of the pond or lake in feet.

CF = 2.72 lb/A foot. The Conversion Factor (CF) when total water volume is expressed on an acre-feet basis. 2.72 lb of a pesticide/A-ft of water is equal to 1 ppmw.

ECC = Effective Chemical Concentration of the active ingredient of a pesticide needed in the water to achieve control of the pest.

I = The total amount of active ingredient divided by the total amount of active and inert ingredients. Liquid products usually list the amount of active ingredients as pounds per gallon. For such products:

$$I = \frac{\text{pounds of active ingredients}}{\text{one (1) gal}}$$

Non-liquid formulations usually list active ingredients as a percentage of the total formulation. For non-liquid formulations:

$$I = \frac{\text{percent active ingredients}}{100\%}$$

The following formula may be used to determine the amount of pesticide formulation on a surface acre basis.

1. Amount of pesticide formulation per surface acre.

$$\text{Amount of formulation} = (\text{Surface acres}) \times (\text{Broadcast formulation rate/A})$$

1. For additional information, refer to UGA Extension Bulletin 866—"Using Chemicals in Pond Management."

BIOLOGICAL CONTROLS FOR AQUATIC VEGETATION

Biological control is an important part of an integrated pest management plan that involves the use of a living organism to control a specific pest. Grass Carp (*Ctenopharyngodon idella)* are useful for aquatic vegetation control and are a popular management option in Georgia ponds. In Georgia, only sterile triploid Grass Carp may be stocked to prevent accidental release and establishment of reproducing populations in natural waterways. Grass Carp feeding preferences for common aquatic vegetation types are shown in the table below.

HIGH	MODERATE	LOW
• Chara • Nitella • Naiad • **Hydrilla** • Elodea • Pondweed • Egeria	• Bladderwort • **Duckweed** • **Watermeal** • Fanwort • Water Ferns • Pennywort • Filamentous Algae	• Alligatorweed • Coontail • Eelgrass • Watermilfoil • Torpedograss • Water Primrose
NO MEASURABLE CONTROL EXPECTED		
• Sedges • Rushes • Maidencane • Parrot Feather • Spatterdock • Water Hyacinth • Water Lilies	• Watershield • American Lotus • Arrowhead • Buttonbush • Cattails • Frog's-Bit	• Pickerelweed • Slender Spikerush • Smartweed • Water Willow • Southern Watergrass • Salvinia

Grass carp stocking rates are dependent on feeding preferences, aggressiveness of the plant, and the relative density of vegetation to be controlled and typically range from 5-15 per acre. Stocking rates can also be adjusted depending on frequency of restocking. Combining biological control with chemical control is often required to achieve desired results with plants that grow aggressively (bold in table above for plants that can be controlled with Grass Carp). See the table below for examples of stocking rates. Initially stocking at a higher rate may be required for dense infestations of aggressive plants, but more frequent restocking may allow for restocking at lower rates.

Feeding Preference	Restock Every 3 Years		Restock Every 5–7 Years	
	Invasive/Aggressive	Non-Invasive/Aggressive	Invasive/Aggressive	Non-Invasive/Aggressive
High	10 per acre	5 per acre	15 per acre	5 per acre
Moderate	10 per acre	5 per acre	15 per acre	10 per acre
Low	10 per acre	5 per acre	15 per acre	15 per acre