

**With RO updates 1/14/09**

**Preventing the Spread of Invasives Species  
Cleaning/Sanitation of Equipment for Fire Operations  
Sawtooth National Forest 2008**

**Prevention**

- Obtain maps of where aquatic invasive organisms occur in watersheds where the operation will take place. GIS coverages of individual species for most areas are accessible to biologists, resource advisors, and fire personnel. These GIS coverages are contained in a personal geodatabase (“Invasives Database”—7.2 mb) available for download at [http://www.fs.fed.us/r4/resources/aquatic/spatial\\_data/index.shtml](http://www.fs.fed.us/r4/resources/aquatic/spatial_data/index.shtml). You can never be certain that invasives are NOT present, but at least you will know ahead of time where they ARE present. For Boise NF; see Fire Operations Guidance Map and District external hard drives. For Sawtooth NF; see external hard drives
- Use pre-identified incident base and helibase locations described in the Fire Management Plan. These areas should be weed-free or have established site-specific mitigations. If these sites are not available, establish these facilities in noxious weed-free areas.
- If possible, establish camps, vehicle and crew staging areas, helispots, cargo and net loading areas, and airstrips in noxious weed-free areas. If such areas are not available, implement mitigation measures as determined by the Weed Specialist/Resource Advisor.
- Water tenders and engines shall not dump water directly from one stream or lake into another in order to prevent the spread of potential aquatic organisms/diseases.
- Engines and helicopters should not obtain water from multiple sources during a single operational period unless drafting/dipping equipment is sanitized between sources.
- Avoid sucking organic and bottom material into water intakes when drafting from streams or ponds.
- Minimize driving equipment through or wading across waterbodies whenever possible.

**Cleaning**

**External equipment surfaces:**

- To reduce the spread of undesirable aquatic organisms, keep equipment and supplies as clean as possible. Thoroughly clean equipment periodically.
- All equipment and vehicles will need to have all plant parts, soil and other materials that may carry noxious weed seeds removed prior to entry onto the Forests or movement from one Forest incident area to another.
- Engines and helicopters moving from areas where whirling disease and other aquatic organism threats occur, to areas where they are not known, shall clean and

sanitize equipment before moving. Power wash all accessible surfaces with clean water, and completely remove all mud and organics.

- Cleaning/Sanitation will be conducted in areas where there is no potential to deliver effluent to waterways. Areas will be designated for cleaning/sanitation of heavy equipment to reduce the spread of noxious weeds and unwanted organisms.

### **Water tenders, engines, and other equipment with internal tanks:**

- Disinfect all equipment prior to use if it has an unknown sanitizing history as well as after an incident. Sanitation will consist of a 5% solution of *Quat128*<sup>®</sup> (6.4 oz per gallon of water) or its equivalent will destroy most if not all target invasive organisms.
- Use backpack spray pumps or similar cleaning devise to clean all portable tanks, pumpkins, and helicopter buckets. The solution must be in contact with the surface being sanitized for at least 10 minutes and then rinsed.
- For engines and tenders circulate the 5% solution of *Quat128*<sup>®</sup> or *Sparquat 256*<sup>®</sup>) from a pumpkin tank for 10 minutes.
- Quaternary ammonium compounds (brand names *Quat 128*<sup>®</sup> [or ‘Waxie’] and *Sparquat 256*<sup>®</sup>) are safe for gear and remain effective for at least a day if not overly diluted or muddied.



### **Testing Disinfectant Concentrations**

- It is recommended that if the disinfectant is too muddy or diluted that the solution be properly disposed of and a new solution made. One way to determine if the solution is below the 5% strength is to use “Quat Chek 1000” Test Papers (you can get these from Local Distributors listed below).
- The made-up solutions of Sparquat or Quat 128 need to be diluted before they can be tested with these papers. The solution to be tested needs to be around 600 ppm of ammonium compounds, which is in the middle of the test paper range.

#### **For Sparquat 256:**

- Take **one** cup (or mug or beer can) of Sparquat solution, pour into a bucket. Add **5** cups (or mugs or beer cans) of water. Mix. Test the diluted solution with “Quat Chek” Test Paper. Match up the color of the paper with the ppm’s on the color chart. For optimal disinfection, the diluted solution should have a concentration of between 600 and 800 ppm.

#### **For Quat 128:**

- Take **one** cup (or mug or beer can) of Quat 128 solution, pour into a bucket. Add **4** cups (or mugs or beer cans) of water. Mix. Test the diluted solution with “Quat Chek” Test Paper. Match up the color of the paper with the ppm’s on the color chart. For optimal disinfection, the diluted solution should have a concentration between 600 and 800 ppm.

### **Disposal**

- Sanitation effluent will be applied to roads in areas where there is no potential to deliver to waterways. Care will be taken to avoid exposing firefighters, the public, or areas outside of the road right-of-way to the sanitation effluent as it is applied.
- Do not dump treated water into any stream or lake, or on areas where it can migrate into any water body. ~~It would be best to offload treated water to sanitary sewers if possible.~~
- ~~Diluted chemicals can be safely disposed of in sewer system when available based on conversations with Spartan Chemical Company.~~
- Do not dispose of diluted quat chemicals in municipal sewer systems. While wastewater treatment plants can process small volumes of used quat solutions, large volumes (hundreds of gallons) of quat solutions could overwhelm a treatment facility, especially ones in small towns.

## Safety

- As the concentration of cleaning chemicals increases, so do the occupational health and safety hazards (irreversible eye damage, skin burns, respiratory irritation) and importance of adhering to personal protective equipment requirements when handling the concentrated product.
- Respiratory Protection is not normally required when there is good ventilation. However, protective rubber or other water-proof gloves are recommended. Eye Splash goggles and/or face shield is also recommended for eye protection.

## Purchase

- Most of the recommended chemicals are available through GSA. See the General Services Administration website, and search with the product's NSN number: <https://www.gsaadvantage.gov>. In addition, quaternary ammonium compounds are available in bulk as swimming pool chemicals at reduced cost.

## Quat 128

*Quat 128<sup>®</sup> (Waxie)*

Waxie's Enterprises Inc.

GSA (NSN No. 170304) = \$36 per case (4 gal)

### Local Distributors include:

Waxie Sanitary Supply  
 2240 S. Cole Road, Suite 110  
 Boise, Idaho 83709  
 (800) 445-5597  
 (208) 376-8700

Waxie Sanitary Supply  
 3839 South American Way

Idaho Falls, Idaho 83402  
(208) 552-1300  
(888) 297-5505

Additional information can be found at the Waxie web site:  
<http://www.waxie.com/index.html>

### **Sparquat 256**

*Sparquat 256*<sup>®</sup>  
Spartan Chemical Company  
GSA (NSN No. 102504) Sparquat 256 = \$52 per case (4 gal)

### **Local Distributors include:**

Gem State Paper  
1801 Highland Avenue, East  
Twin Falls  
(208) 733-6081

Brady Ind. of Idaho  
5198 Chinden Blvd.  
Boise  
(208) 887-2199

Gem State Paper  
10189 W. Emerald  
Boise  
(208)658-0449

Brady Industries of Idaho  
1395 Enterprise Way  
Idaho Falls  
(208) 227-0578

Additional information can be found at the Spartan Chemical web site:  
<http://www.spartanchemical.com/web/webhome.nsf>

### **Storage**

Sparquat 256 and Quat 128 (Waxie) – Can be stored up to 2 years in an unopened container without losing its effectiveness. Both should be stored in a cool, dry place, out of direct sunlight. Temperatures can range from 32 to 110 F.

### **Concentration**

## Quat. 128

To reach a 5% solution, follow these guidelines:

<i>Assuming all active ingredients in Quat 128® are equally effective</i>	Based on the <i>active ingredients</i> in Quat 128 in common with Sparquat 256
mL Quat 128 per 100 mL water	4.63
mL Quat 128 per gallon water	187.90
liquid oz. Quat 128 per gallon water	6.35
tbsp liquid Quat 128 per gallon water	12.7
cups liquid Quat 128 per gallon water	0.79
<b>gallons Quat 128 per 100 gallons water</b>	<b>4.96</b>
<b>cost Quat 128 per gallon of water treated</b>	<b>\$0.45</b>

## Sparquat 256

To reach a 3% solution, follow these guidelines:

<i>Assuming that only the a.i. in Sparquat 256® that was tested is effective</i>	Based only on the ADBAC a.i. in Sparquat 256® (5%) in common with Formula 409
mL Sparquat per 100 mL water	3.00
liquid oz. Sparquat per gallon water	4.12
tbsp liquid Sparquat per gallon water	8.2
cups liquid Sparquat per gallon water	0.51
<b>gallons Sparquat per 100 gallons water</b>	<b>3.22</b>
<b>cost Sparquat per gallon of water treated</b>	<b>\$0.42</b>