MONTANA STATE UNIVERSITY | EXTENSION

PESTICIDE NEWS

Winterizing Spray Equipment and Cold Storage of Pesticides. (Monday 9/27/2011 12:00PM)

Cecil Tharp (MSU Pesticide Education Specialist)

(Photo Credit USDA)

Applicators should take time to prepare spray equipment and pesticide supplies prior to long term storage during the winter months. Prior to storage, applicators should clean sprayers thoroughly, drain pesticide residual from tank, decontaminate sprayers and inspect sprayer components.

Rinsing & Cleaning Sprayers. The outside of a sprayer should be washed, while also rinsing spray tanks. Spray tanks can be rinsed by circulating water through the spray system by adding water up to 10% of spray tank capacity and spraying on a labeled site. Many pesticide product labels will recommend adding select cleaning agents to spray tanks to aid in removing water and oil soluble pesticides (Table 1). Tank cleaning agents work in a variety of ways including: 1) addition of ammonia to raise pH of rinsate solution to increase water solubility, 2) addition of chlorine bleach to increase the breakdown of many pesticide products into inactive compounds, 3) addition of fuel oil or kerosene for removing oil soluble pesticides including esters and emulsified concentrates. Nozzles, screens, and strainers should be removed and cleaned separately in a bucket containing water and the recommended cleaning agent once the tanks have been cleaned.

Bleach should never be mixed with ammonia as this creates a deadly chlorine gas. In addition, fuel or kerosene should be followed by a detergent rinse to remove oily residue. Cleaning agents should be washed through entire spray system prior to rinsing with clean water. It is critical that all 'rinsate' be sprayed upon a site written on the pesticide product label or collected into containers and treated as pesticide waste.

Final Inspection and Preparation for Storage. Upon final rinse you can inspect nozzles, screens, valves, hoses and tank for wear or damage. To protect sprayer pumps and lines from corrosion and freezing damage over the winter months circulate antifreeze through entire sprayer. A 50/50 mixture of antifreeze and water should be pumped through system for at least 5 minutes.

With the antifreeze mixture still in the system remove some components:

- Remove pressure gauges and check valves. Store in marked container at room temperature over the winter to avoid damage from freezing temperatures. Plug assemblies.
- Nozzles and screens should be removed and placed into a marked container filled with lightweight oil (kerosene or diesel fuel). Correctly plug these assemblies as well.

By capping assemblies, remaining antifreeze will ensure that lines don't freeze and crack. Antifreeze should remain in sprayer through winter months to avoid air moisture from corroding internal components of sprayer. Sprayer should be ready for storage in a sheltered location away from liquid and dry fertilizers which will corrode paint and hardware.

Table 1. Cleaning Solutions for Pesticides.*

Pesticide Used	Step #1 (per 25 gallons of solution)	Step #2	Step #3
Hormone Herbicides (2,4-D salt, amine, brush killers, MCPA, dicamba)	1 qt. household ammonia or 1 lb. washing soda (sal soda) or 2 lb. trisodium phosphate or ½ lb. fine activated charcoal and ½ cup detergent	Agitate solution for 15 minutes. Agitate solution for 15 minutes. Agitate solution for 15 minutes. Agitate sprayer for 2 minutes.	Let stand overnight. Flush with clean water Let stand for 2 hours Flush with clean water Let stand for 2 hours Flush with clean water Let stand for 10 min. Flush with clean water.
Hormone Herbicides ester form (2,4-D, brush killers, MCPA)	1 lb. washing soda (sal soda) + 1 gal kerosene + ¼ lb detergent	Rinse inside of tank and flush small amount through system.	Let stand for 2 hours. Flush and rinse.
Amino Acid Inhibitors (SU's including primisulfuron, prosulfuron, and halosulfuron)	2% household ammonia then circulate for 15 minutes and flush	1% household ammonia, circulate for 15 mins then flush	Rinse tank for minimum of 5 minutes using clean water.
Organophosphate or carbamate insecticides	1 qt. household ammonia + ¼ lb detergent	Flush a small amount through system.	Rinse with clean water.
Other herbicides and insecticides	¼ lb detergent	Flush a small amount through system.	Rinse with clean water.

*Applicators should always read and follow any pesticide product label cleaning instructions.

Long Term Storage of Pesticide Products. Granular and wettable powders are not generally impacted by freezing but should be stored in a dry location. Liquid pesticides may freeze and result in separation of the active ingredients from carriers which could reduce effectiveness of pesticide product. This reaction may include

coagulation or crystallization which may cause further plugging of spray lines. Some frozen pesticide products often retain effectiveness if applicators follow steps when thawing and re-dissolving the suspension.

Pesticide products have different freezing temperatures due to the presence of hydrocarbon solvents in many formulations. Hydrocarbon solvents actually reduce the freezing point below 32 degrees F. Pesticide product labels often explain a pesticides minimum storage temperature, in addition to whether: 1) freezing poses a problem, 2) active ingredients separate from carriers if frozen, 3) effectiveness of a pesticide is reduced if frozen, and 4) the active ingredients and inert ingredients go back into suspension.

Applicators should always be familiar with storage directions on their pesticide product label. For more information consult the chemical manufacturer or read the MontGuide titled 'Cold Weather Storage and Handling of Pesticides' at www.pesticides.montana.edu by selecting 'References'.

FOR FURTHER INFORMATION: See the MSU MontGuide titled "Maintainance, Storage and Cleaning of Sprayers" at pesticides.montana.edu/Reference/Sprayercleaning-MT198917AG.pdf for more information. Contact the MSU Pesticide Education Program if readers have any further questions (Cecil Tharp, 406-994-5067, ctharp@montana.edu).