

SAFE Storage, Handling and Disposal of PESTICIDES and CONTAINERS

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Pesticides used in agriculture must be handled safely to protect the applicator, family and consumer. Storage of pesticides, disposal of old or unusable pesticides and rinsing and disposal of empty containers are becoming major concerns as potential sources of groundwater and environmental pollution.

Pesticide disposal is best handled by mixing only enough chemical to complete the job, and rinse water should be sprayed on a label approved site.

Mixing only enough chemical to complete a job eliminates unused pesticide but sometimes is difficult to do. Finding a place to rinse and flush the sprayer without harming the environment can also be a problem. When sprayers are cleaned repeatedly and the rinse water dumped in the same area, a potential threat to groundwater quality exists. If unused pesticides or rinse water seep into underground water supplies and subsequently into wells, a hazard to humans may result.

Facilities for catching, holding and disposing of pesticide rinsate are being built. The size of the facility needed by commercial or farm applicators may vary depending on the amount of pesticide used and the amount of wash water needed. **At this time it is unknown if these facilities are the answer to handling unused pesticide. However, they should help find answers.**

Disposal of empty pesticide containers is becoming more of a problem. At the present time the only permitted disposal method for commercial applicators is to triple rinse containers and dispose of them

at sanitary landfills. Crushing barrels reduces the space required for transportation and burial. **Caution: some landfills want containers uncrushed so they can verify that they have been triple rinsed.** Check with the landfill before crushing containers.

NDSU Carrington Research Extension Center

The Carrington Research Extension Center has designed and built a pesticide catch and disposal facility. It consists of a concrete catch pad and two open 600-gallon fiberglass holding tanks (Figure 1). The tanks are located below and at each end of the concrete pad and are located inside a larger 1,000-gallon tank to catch any pesticide that may leak from the inner tank. The tanks are covered with mesh and supports to keep children and animals out. It may be best to enclose the holding tanks with a chain link fence.

Railroad ties are placed around the tanks to keep soil away and the tanks exposed. If a leak occurs in the outer tank, it will be much easier to spot. The tanks are not considered underground storage facilities and, as such, are exempted from underground storage tank regulations. Check with North Dakota State Health Department and Consolidated Laboratories for specifics on underground storage tanks (UST).

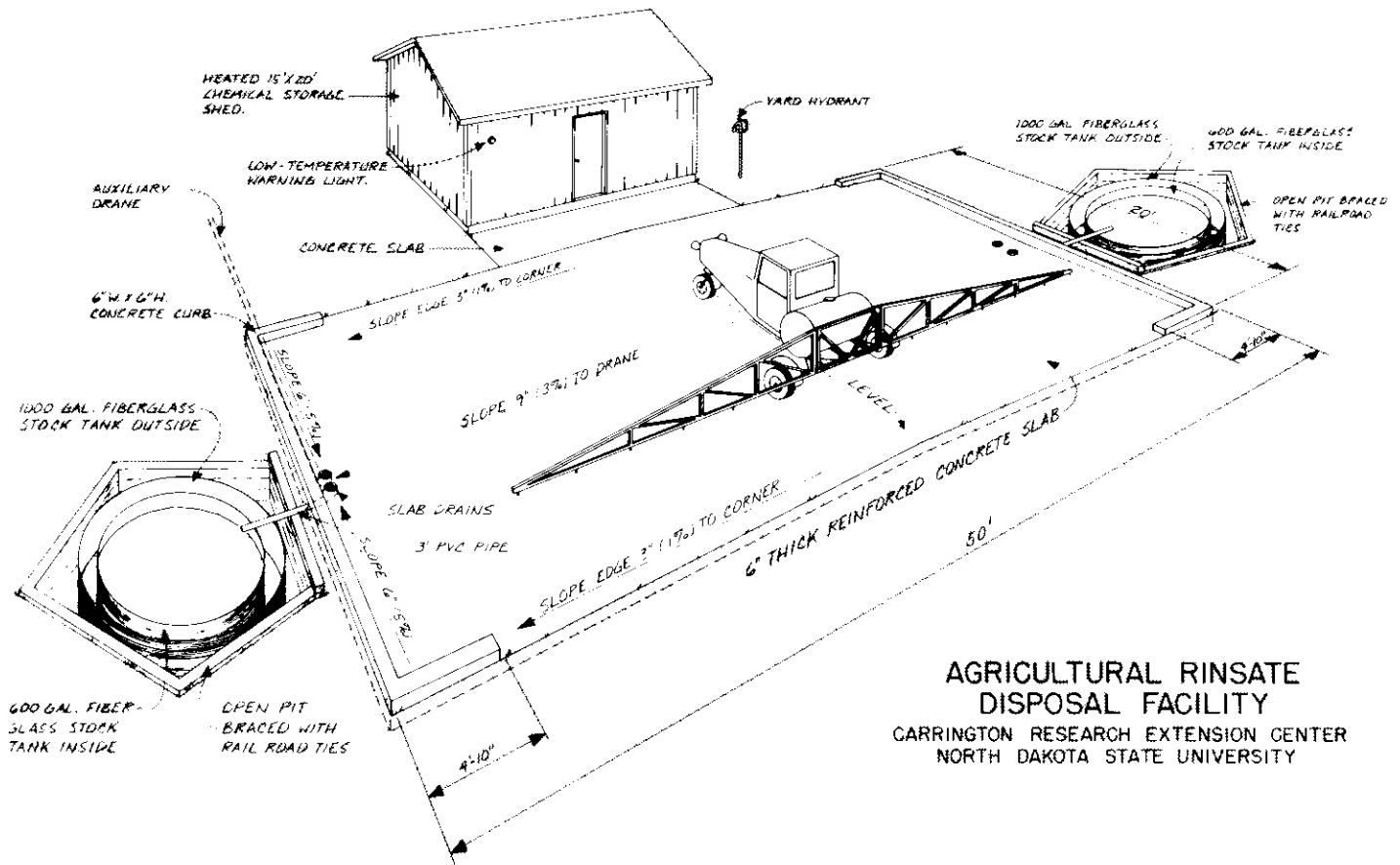
The catch apron is 6-inch thick reinforced concrete. The concrete is made with a high cement-to-



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**AGRICULTURAL RINSATE
DISPOSAL FACILITY**
CARRINGTON RESEARCH EXTENSION CENTER
NORTH DAKOTA STATE UNIVERSITY

Figure 1. Agricultural rinsate disposal facility, Carrington Research Extension Center, North Dakota State University.

water ratio for added strength. It is 20 feet wide, 50 feet long and slopes to each end. The length of the apron should be slightly longer than the extended width of the sprayer unless the sprayer can be operated when folded. Each end of the apron has two drains. One diverts rain water to the side of the apron onto a grassed area and the other leads to the holding tank. If the catch apron is being used for washing or loading sprayers, the drain used to divert rain water is plugged. If the apron is not being used to catch sprayer wash water, the drains leading to the holding tanks are plugged. (Use flags on drains as a reminder.)

This system uses a two-stage approach to chemical decomposition. The first is breakdown by sunlight (photodecomposition) and water (hydrolysis). Decomposition from sunlight occurs when ultraviolet radiation strikes the solution in the open tanks. The solution absorbs the sun's energy and chemical reactions occur which break down some organic pesticides. Photodecomposition will quickly break down many insecticides and herbicides.

Disposal tanks should be large enough to hold rinse water from one season. This will allow the collected pesticides to absorb sunlight over the entire summer. Evaporation on a warm cloud-free day may

be .3 inches per day from an open tank in North Dakota and will help reduce the total volume of solution that must be stored.

After sprayer cleaning is completed, the pesticide is held in the open tanks not to exceed 90 days, in compliance with guidelines in keeping it a temporary waste site. The solution is then pumped onto a compost pile consisting of hay, straw or other organic farm waste.

This starts the second stage - microbial breakdown. Naturally occurring bacteria, fungi and other micro-organisms use the pesticides as a food source and decompose them into simpler compounds that should be nontoxic to the environment. Microbial decomposition reduces those chemicals that are not completely broken down by sunlight.

Under North Dakota conditions, it is not known how long a compost pile must be maintained. Experience from other researchers suggests that compost material may have to be maintained for up to 18 months, depending on what pesticides are contained in the waste. It is hoped that the end result is an environmentally safe material that can be spread on fields.

The compost pile should be placed on concrete with a low restraining wall all around. This will help keep all pesticides confined on the concrete pad. A roof should be placed over the pile to divert rain water. It is also recommended to leave all sides open so air can move over and around the compost. Stirring and addition of water may be required. At this time, a compost pile is only experimental. Samples from the pile will be taken and analyzed for pesticide decomposition. The North Dakota State Health Department has **not** approved this method for general use.

The chemical storage building is 15 x 20 feet and is insulated and heated. The interior is covered with plywood. Sealed shelves are provided for small container storage off the floor. A continuously running fan is mounted in a wall to exhaust pesticide fumes caused by leaking containers or spills. When the door is opened and the lights turned on, the fan speed increases for more ventilation when people are in the storage building.

and a 30 x 24 foot concrete pad outside which is used to catch accidental spills during filling and washing of sprayers and to collect unused mixed pesticide solution. The concrete pad slopes to a center gutter and a drain pipe carries the pesticide to a 200-gallon holding tank. The collection pad wash water is also held in the tank. Rainwater is diverted to a grassed area. The tank holds pesticide and wash water until it can be pumped into a sprayer and used for the intended spraying operation. The tank sits inside a sealed concrete retaining wall above ground. A roof covers the tank to keep out rainwater.

The pesticide storage area is ventilated, insulated, heated and should be locked. This keeps the temperature above freezing and pesticides separated from other products and activities. A ventilation fan is mounted in an exterior wall to exhaust pesticide fumes.

The facility contains a shower and an emergency cleanup kit in the wash room. If a chemical is accidentally splashed on someone, it can be washed off immediately. If a chemical is spilled, it can be quickly cleaned up. All containers are triple rinsed with a washer that collects the washwater and pumps it into the spray tank. The containers are punctured to prevent secondary use and are placed in a separate storage building until they are discarded in a sanitary landfill.

Cass County Weed Board

The Cass County Weed Board constructed a 30 x 40 foot pesticide storage and office building (Figure 2). It contains a work and wash area inside

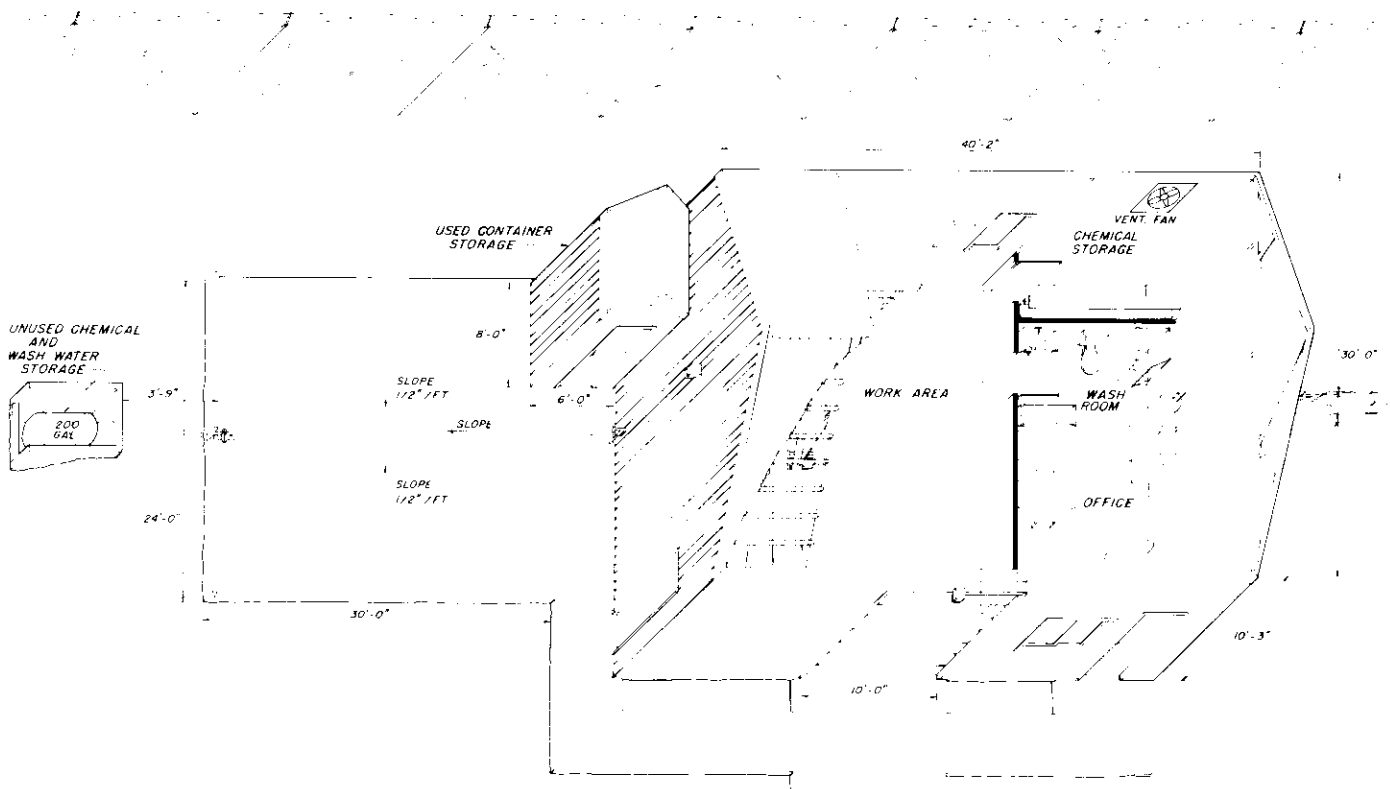


Figure 2.

All water fill lines contain a check valve for preventing backflow of pesticides into water lines if water pressure is lost.

Pesticide Storage Building Plans

Several plans for pesticide storage are available. They are:

MWPS 74002 - Pesticide Storage and Mixing Building, 16' x 24'

USDA 6346 - Pesticide Storage Building, 13' x 20', Concrete Block Building

USDA 6136 - Pesticide Storage Building, Poleframe, 12' x 12'

AF 169 - Pesticide Storage Facility, 8' x 12', Wood Frame, Cooperative Extension Service, Kansas State University, Manhattan, Kansas



Figure 3. Empty pesticide cans and barrels can accumulate rapidly during the spraying season.

Pesticide Barrel Crusher

Empty pesticide container disposal is the responsibility of the pesticide applicator. Empty metal barrels and cans can accumulate rapidly during the spraying season (Figure 3). Some containers can be returned for re-use, but this is done by only a few chemical companies. Scrap metal dealers will not accept them because pesticide residue may remain inside. Therefore, the only means of disposing of metal containers by commercial applicators is by burial in a sanitary landfill. Private applicators may bury containers on their own land in a well drained area. All containers must be TRIPLE RINSED before being buried either in landfills or on private property. This eliminates the residue problem and also saves expensive chemical that would otherwise be lost. After rinsing, barrels should be punctured and crushed before they are taken to a landfill. This removes the possibility of anyone using the container for any other use. Also, crushing allows more containers to be carried in a load. (Note: Check with landfill, some won't accept crushed containers.)

Many sanitary landfills will accept triple-rinsed containers, but check with the individual landfill before showing up with a load of containers.

N.D. Plan #3156-1 for building a barrel crusher is available from NDSU Extension Service county offices (Figure 4). It is capable of crushing a 55-gallon or smaller container. It mounts on a tractor's three-point hitch and uses the tractor's hydraulic system to operate a 36-inch cylinder that crushes the container. Note: This crusher is not extremely heavily

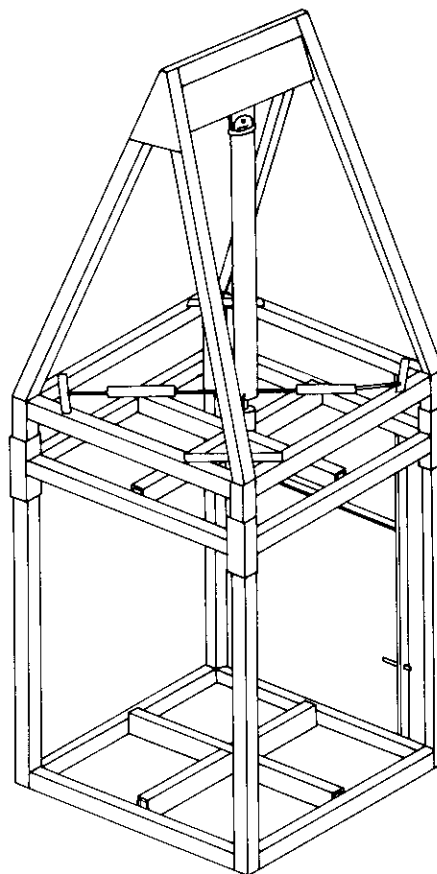


Figure 4. Pesticide barrel crusher.

built so do not expect to use it to crush barrels as a business. It is designed to crush containers for an individual commercial applicator.

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