

# **1 ½inch PVC mini silo**

Stuart Rymph - 1/19/1999

## **Parts list**

### **Silo**

1 ½inch PVC pipe approximately 20 inches long

1 ½inch clean-out adapter with threaded plug – fits over the outside of the 1 ½inch pipe  
PVC cleaner and glue

### **Cap**

Small balloon – assorted colors are nice

or

No. 10 stopper with 1 hole ¼inches in diameter in center

¼inch PVC tubing approximately 6 inches long

3/8 inch OD / ¼inch ID vinyl tubing at least 9 inches long

7/8 inch OD / 5/8 inch ID PVC pipe 2 inches long

### **Assorted pieces**

#### **For Silo**

6 + inch square pieces of plastic garbage bag – 2 per silo

Sand – wet or dry (wet packs better)

Teflon tape

#### **For filling/emptying**

1? Inch grey plastic conduit with bell shaped end. I can't read what size the conduit is but the bell shaped end fits snugly inside the 1 ½inch PVC pipe – probably 1 or 1 ¼inch conduit.

or

crow bar with tamper end

6 inch wide piece of wood or plastic cutting board(easier to clean)

#### **For emptying**

1 ½X 2 inch PVC reducing coupling – only one needed but get 1 or 2 more for spares

1 ¼ inch diameter round wooden plug

## **Assembly**

### **Silo**

Cut 1 ½inch PVC pipe to length

Clean one end and glue on clean-out adapter

Let dry

Wrap threads of clean-out plug with teflon tape and screw into clean-out adapter

Tighten with waterpump/Channellock type pliers

### **Tamper**

Cut wooden plug to fit the inside of he bell end of the 1 ¼inch plastic conduit

Press plug into place

Fill conduit with sand and cap straight end

## **Filling Procedure**

Place one piece of plastic (cut from garbage bag -approx. 8 inches square) over open end of silo and tamp lightly with conduit/tamper to cover clean-out plug and threads at bottom-inside of silo. This keeps the plug cleaner and helps keep air away from the silage

Place clean-out end (bottom) of silo on the 6 inch wide piece of wood or cutting board.

Place several handfuls of chopped forage into open end (top) of silo (fill to approximately  $\frac{1}{4}$  -  $\frac{1}{3}$  of the distance to the top of the silo).

Place tamper into top of silo and slam it down violently several times (at least 10-15 times - will vary with weight of the tamper). Rotate the silo  $\frac{1}{4}$  -  $\frac{1}{2}$  turn after every few strokes to promote even packing. You will feel when the forage is getting well packed – feels like hitting firm ground.

Repeat the fill/tamp cycle until silo is within 4 inches of the top of the silo or you run out of forage.

Cover open end of silo with the other 8 inch square of plastic and tamp it firmly into place. This helps seal the silo and provides a barrier between the silage and the sand above it.

Fill the remaining space in the silo with sand. If sand is wet pack by hand, if dry, don't bother trying to pack it. This helps exclude air from the silo.

Cap with balloon. Cut the neck off the balloon just below where it starts to bulge. Tape the edges of the balloon to the outside of the silo. Do not tape over the top, the balloon needs to expand as gas is produced. Check silos periodically (1 or 2 times daily for first week, once every week after that) to make sure the balloon hasn't slipped off or ripped.

If using the No. 10 stopper.

Push the  $\frac{1}{4}$  inch OD PVC tubing through hole in the stopper so that it is flush with the bottom (narrow) end of the stopper or passes through slightly.

Push the  $\frac{3}{8}$  OD /  $\frac{1}{4}$  inch ID vinyl or rubber tubing over the upper end of the PVC tubing until tight, clamp if desired.

Fold the upper end of the vinyl tubing over itself and push folded end through the short piece of  $\frac{7}{8}$  inch OD PVC pipe. This serves as a clamp to seal off the tubing.

Cut a small slit through the vinyl tubing below the clamp. This should normally seal itself but will allow gas to escape when the pressure is high enough to open the slit. This is essential or the plug will blow off the end of the silo.

The stopper is a more durable cap but it doesn't provide as good of a seal as the balloon.

## **Emptying Procedure**

Remove balloon or stopper

Pour out sand

Place 1 ½ inch end of reducing coupling over end of silo. This is the end the silage will be forced out of. The coupling allows the silage to escape and provides some protection for the end of the silo.

Remove threaded plug from bottom of the silo

Place tamper inside the end of the clean-out adapter – it is usually a tight fit.

Place the silo upside down (coupling end down) on the piece of wood or cutting board

Pick up the tamper (at first the whole silo will lift with it) and slam it down. Repeat until all of the silage is forced out of the silo. The silage usually comes out in pieces. Lift the end of the silo off the wood every 10-15 strokes to clean out the silage that has been forced out. Place pieces in a row, representing the profile of the silage in the silo.

Take a subsample of the silage from the middle of the profile.

### **Notes:**

These silos are not airtight and juice will seep out of the bottoms or blow out the slits of the plugs if the moisture level is too high.

I've had mixed results with these silos. Some very good silage with pH's around 4.2 and nasty stuff with pH's around 6.7. In addition to packing well, wilting and capping are critical. I use a pH of 5.1 as a threshold between good and unstable silage. The silage pH was consistently below 5.1 when the moisture level of the forage was below 60% (>40% DM). The direct cut samples that I put up in September 1997 ran 65% - 80% moisture (20% – 35% DM) and the majority of them had pH levels in excess of 5.1. (See graph)

I didn't start using balloons as caps until the end of the 1997 harvest season but I feel more comfortable with them than with the rubber stoppers – PROVIDING THE SILOS ARE CHECKED FREQUENTLY FOR THE FIRST WEEK AND ARE NOT MOVED. I'm sure some air can get through the rubber compound but you can visually inspect the seal and you can watch the gas production, especially if the balloon has some free space above the top edge of the silo.



Clean-out adapter with threaded plug in place

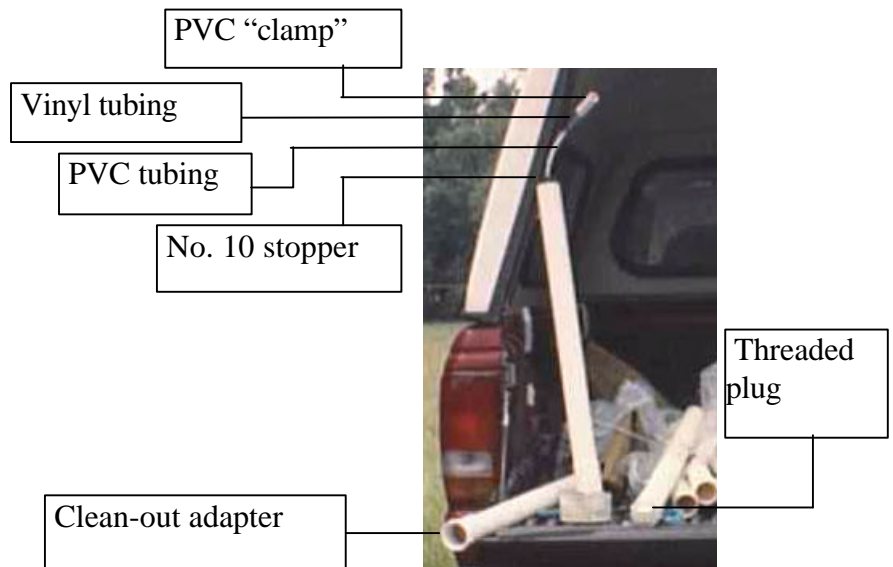
**Assembled silo**



**Filling silo**



**Starting Silo(plastic barrier) and packing**



**Filled and capped silo**

# 1997 Tifton 85 Bermudagrass Silage - Mini Silos Ona and Bell Sites - All Harvest Dates

