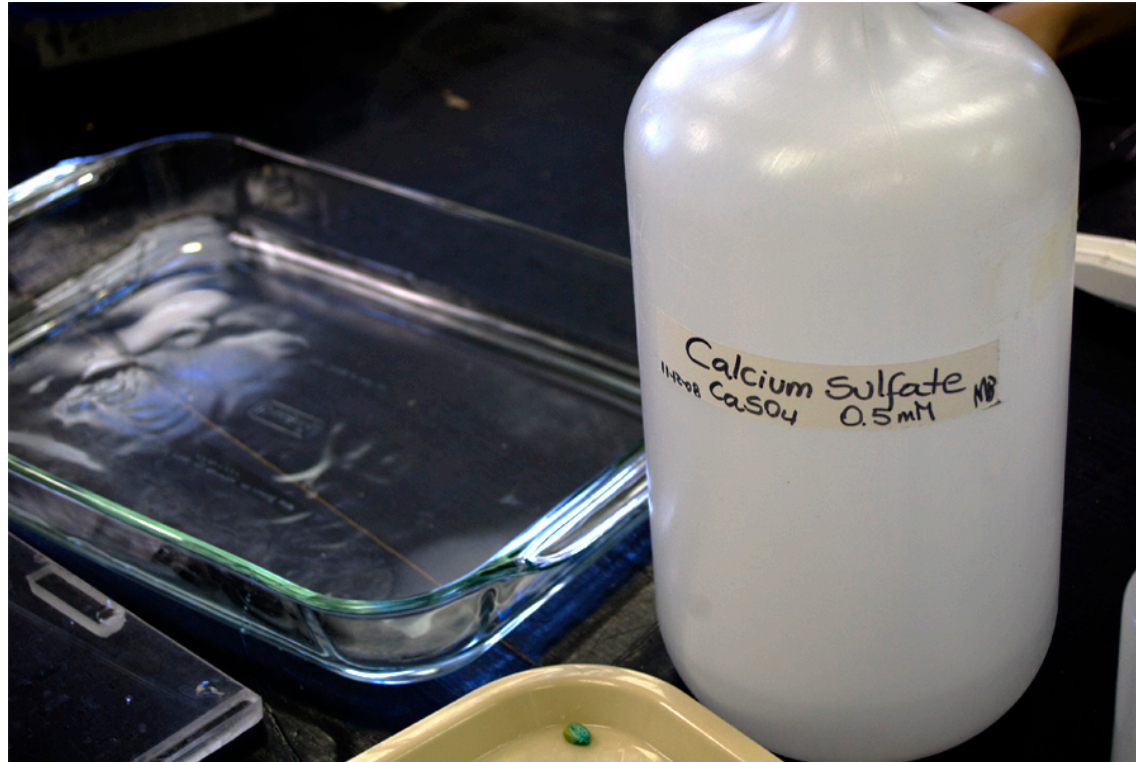


**Maize seedling
Root Growth Evaluation Box:
The Illustrated Method.**

Developed at Penn State University
College of Agriculture
Lab of Dr. Jonathan Lynch
Dept. of Horticulture
by Bob Snyder: 2009



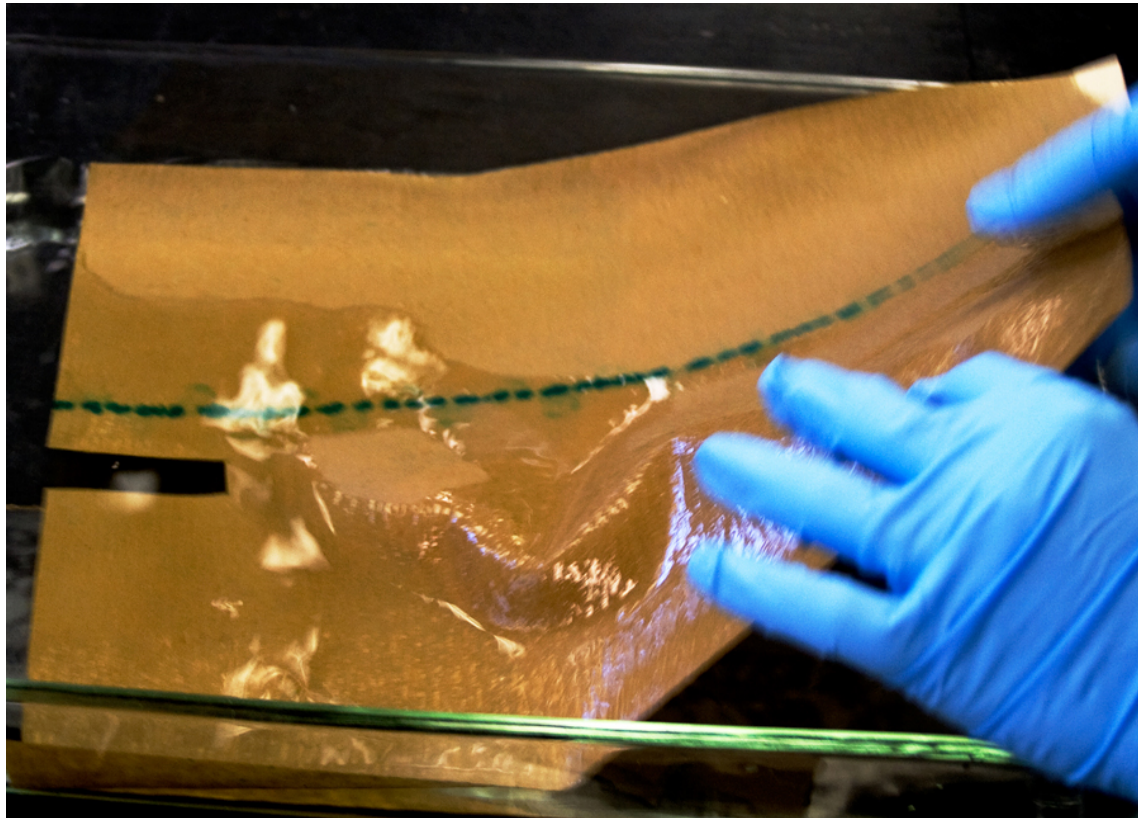
Calcium Sulfate (0.5 mM) used to hydrate germination paper.



Plexiglass back piece ($3/16$ " thick x 10.5" wide x 12" long)
With two 8" long x $1/2$ " wide x $3/8$ " thick support bars.



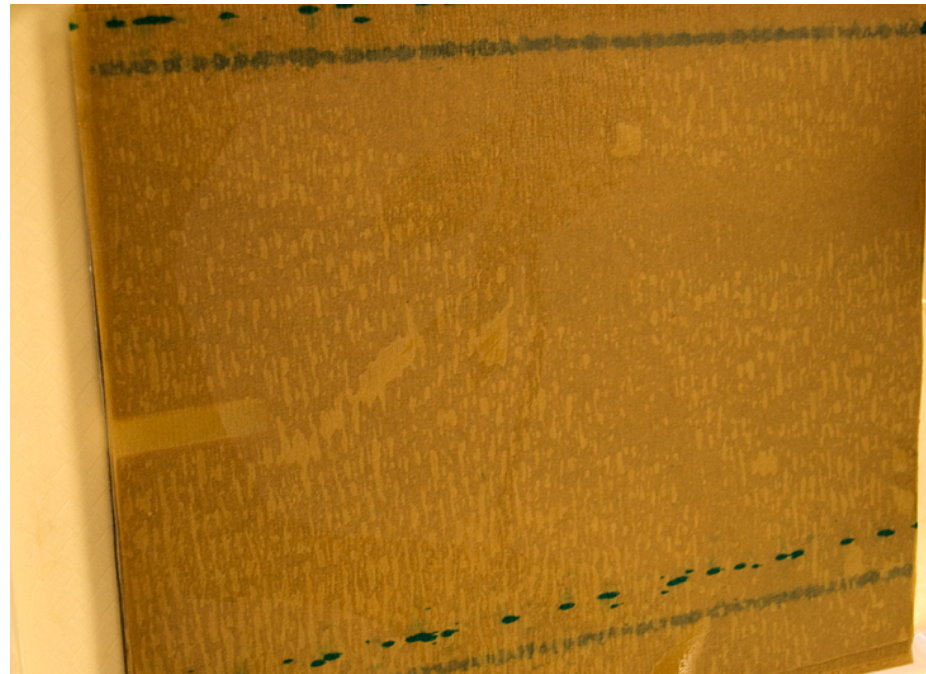
Hydrating first layer of 78lb germination paper in CaSO_4 .



Layering 3 sheets of 78 lb germination paper with a ½” wide
By 2” deep “germination notch” cut into the top edge.



Layer one sheet of 37lb germination paper over the 3 layers of 78lb paper: do not cut a germination notch.



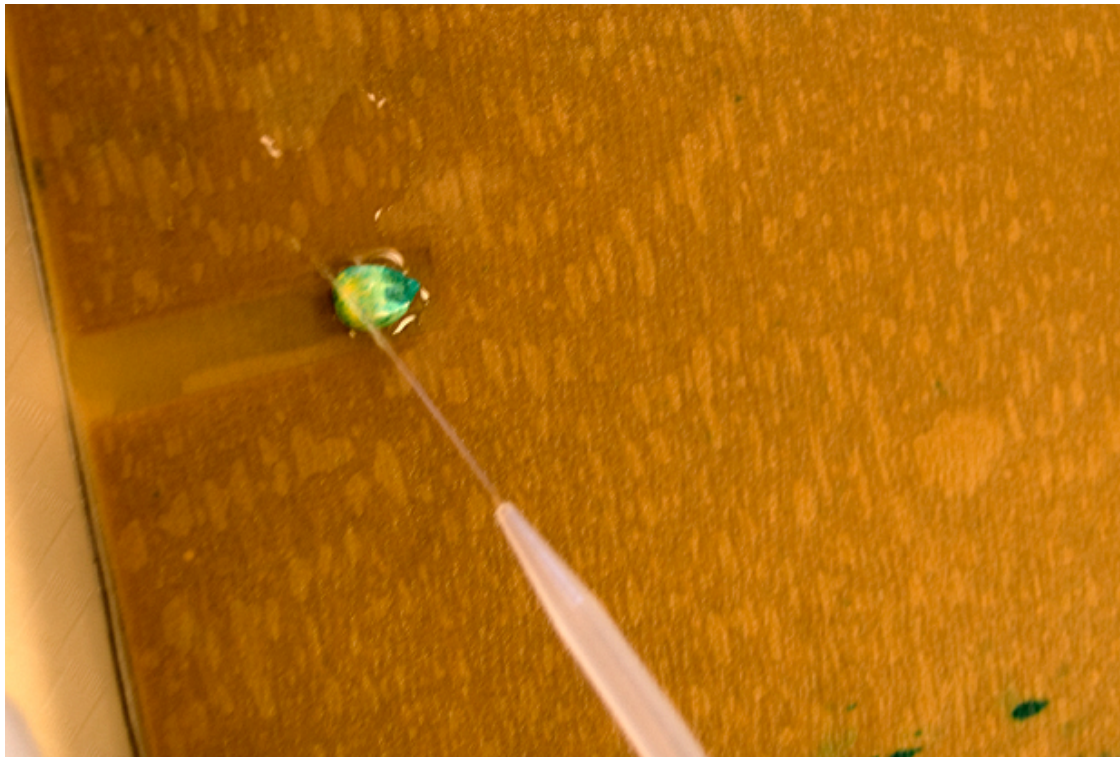
Make a “germination cradle” with your finger, to support the seed.



Place seed with embryo facing down, upon the paper.



Saturate the germination paper around the seed with 0.5 mM CaSO_4 to ensure that the seed will imbibe and germinate in situ.



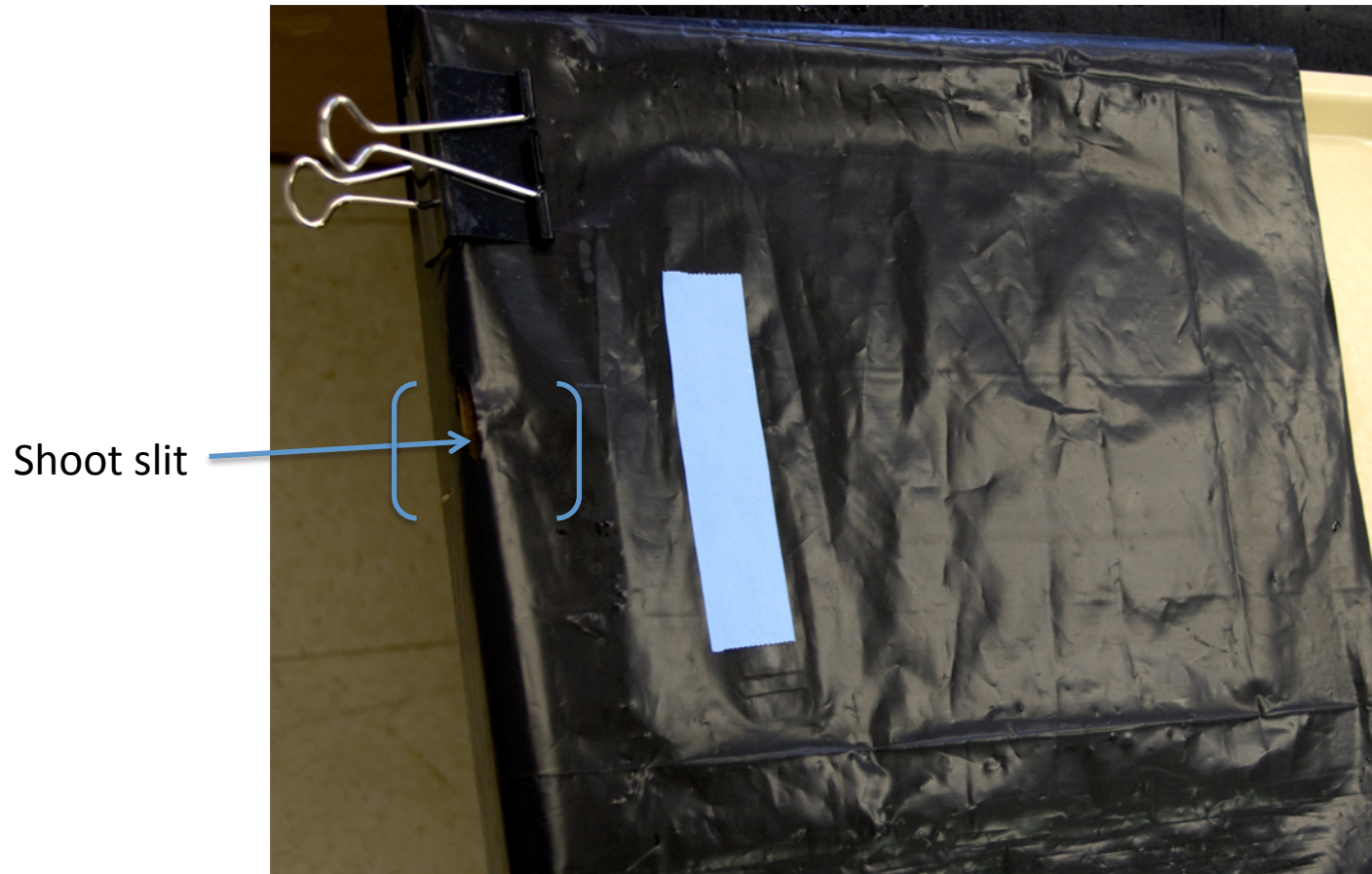
Place the top cover over the seed as shown. The plexiglass strips, will hold the cover 3/8" above the seed.



Place the black plastic “Light Exclusion Cover” over the top plate.



Position the “shoot slit” centered over the “germination notch”, at the top of the box. Then wrap the cover over the edges of the box and secure with 6 large binder clips. Place a piece of labeling tape over the front and label with genotype code.



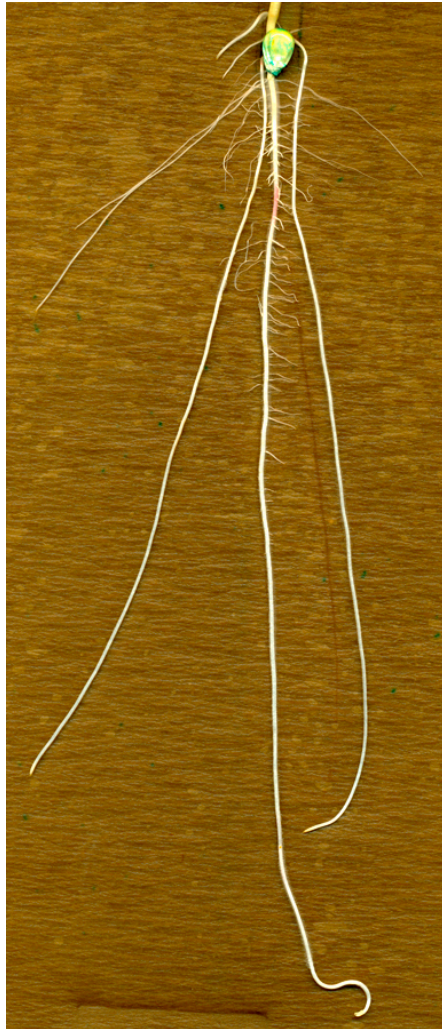
24 root boxes can be placed within one mylar-covered growth closet (metal storage rack; top and sides covered with 6 mil silvered mylar). Temperature and humidity data are monitored with a Hobo data logger. Light is supplied by a bank of fluorescent lamps controlled by a timer: 16hrs of light, 8 hrs of darkness.



CaSO₄ (0.5mM) solution, at least 1" deep in the plastic pans hydrate the germination paper in each box.

Scan 7-day old seedlings at 600dpi and analyze with Image J

7-day old seeding



Root detail

Scale (mm) included in initial scan, for calibration when using Image J for analyses.

