

# Plant Propagation Lab Exercise

## Module 2



**UF** | UNIVERSITY of  
**FLORIDA**



### PROPAGATION OF PLANTS FROM SEED

### SEED VIABILITY TESTING

An introduction to plant propagation laboratory exercises by:  
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# LAB OBJECTIVES\_GC

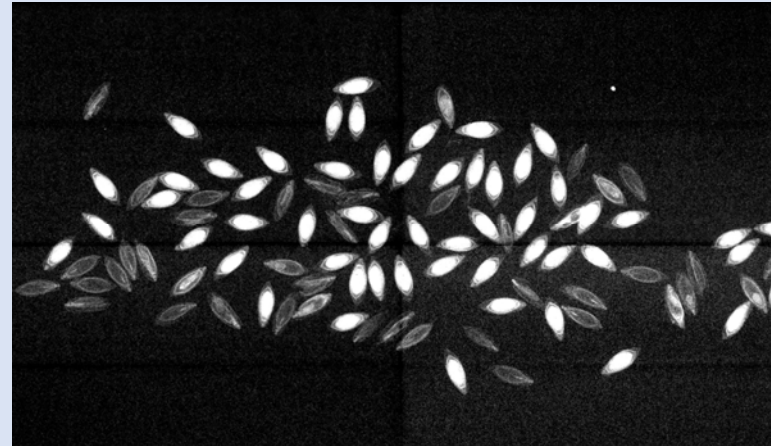
- Review the concept of seed viability.
- Describe the steps of a TZ seed viability test
- Describe the steps of an X-ray viability test
- Describe the steps for conducting a rolled paper towel viability test
- Provide an opportunity for evaluating the results of seed viability tests using photographs.

# SEED VIABILITY TESTS

- Tetrazolium (TZ) test



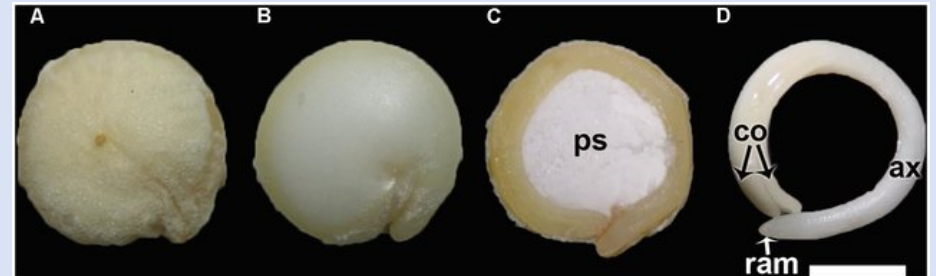
- X-ray analysis



- Rolled paper towel test



- Excised embryo test



# TZ SEED VIABILITY TEST

- Quickly tests seed viability
- Seeds placed in TZ (Tetrazolium chloride) solution prepared by dissolving the powder in water
- Respiring tissues within the seed stains **red**

## FAMILY: SOLANACEAE

GENUS: *Petunia*, *Nicotiana*

Post Staining Notes: None



### 3. EVALUATION:

#### VIABLE (NORMAL STAINING)

- entire embryo evenly stained
- entire endosperm evenly stained

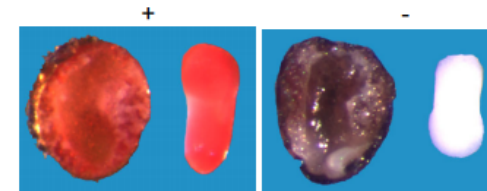
#### NON-VIABLE (ABNORMAL OR NO STAINING)

- any part of embryo or endosperm unstained

#### OTHER TISSUE/NOTES

Normal endosperm may appear granular.

*Petunia*



*Nicotiana*

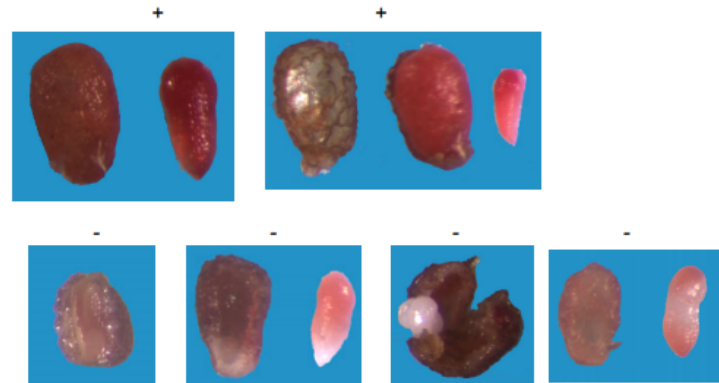


Fig 4 Seed stain evaluation

## TZ SEED VIABILITY TEST

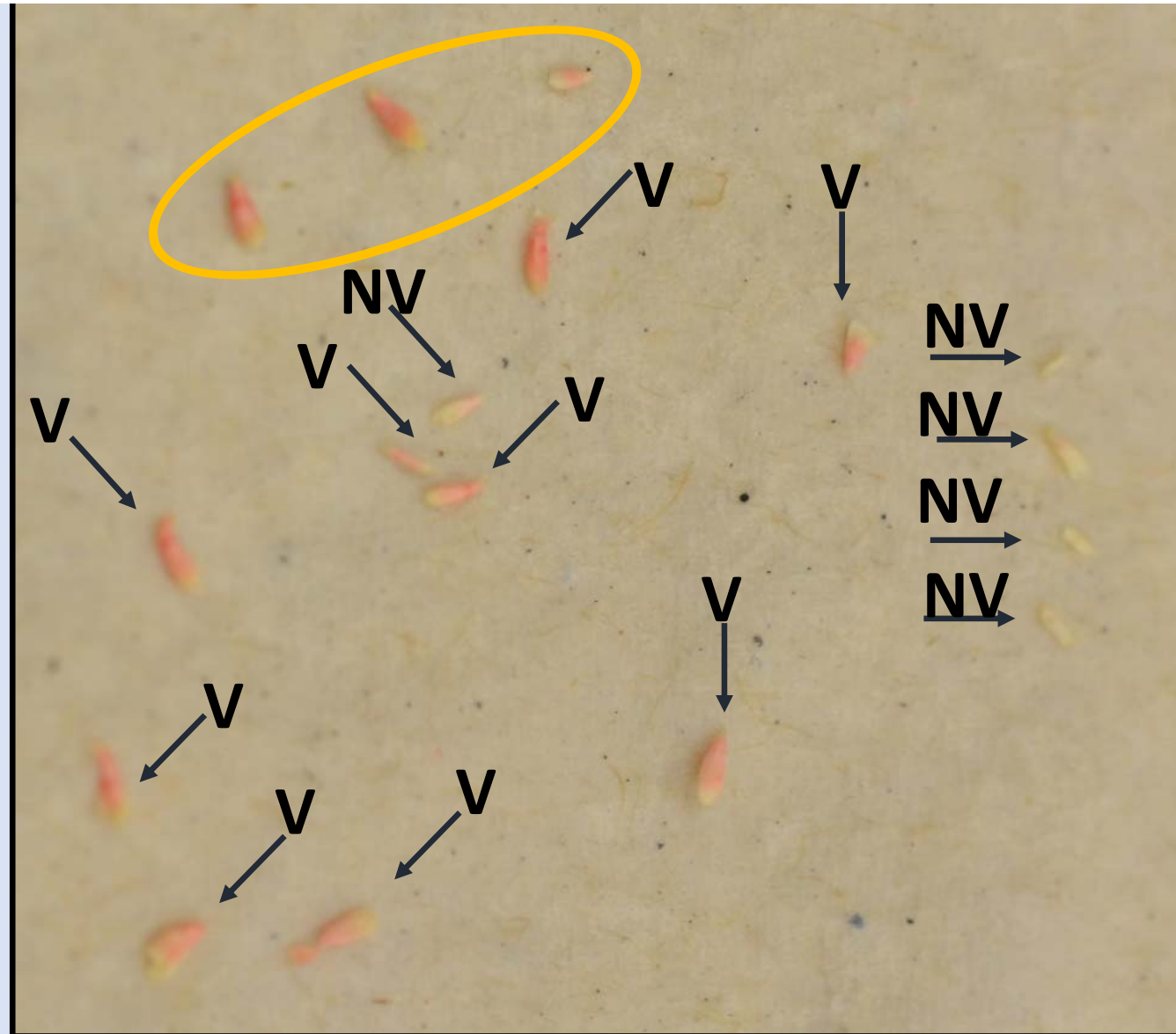
$$\text{Viability (\%)} = \left( \frac{\text{\# stained seeds}}{\text{\# total seeds}} \right) \times 100$$



## TZ SEED VIABILITY TEST

$$\text{Viability (\%)} = \left( \frac{\# \text{ stained seeds}}{\# \text{ total seeds}} \right) \times 100$$

$$\text{Viability (\%)} = \left( \frac{8}{14} \right) \times 100 = 57 \%$$



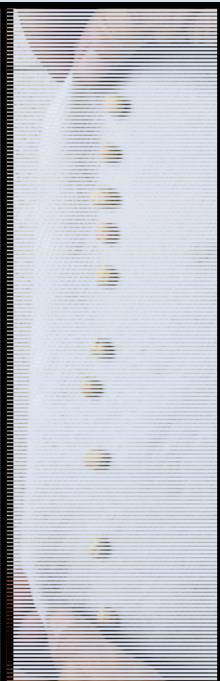
# ROLLED TOWEL TEST



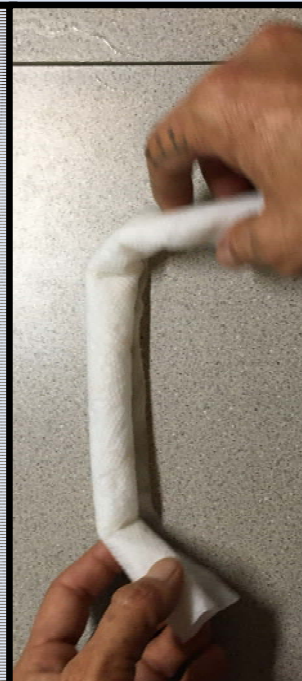
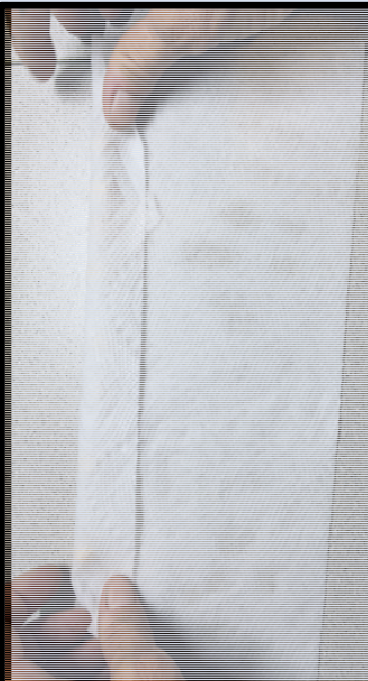
1. Place seeds on paper towel



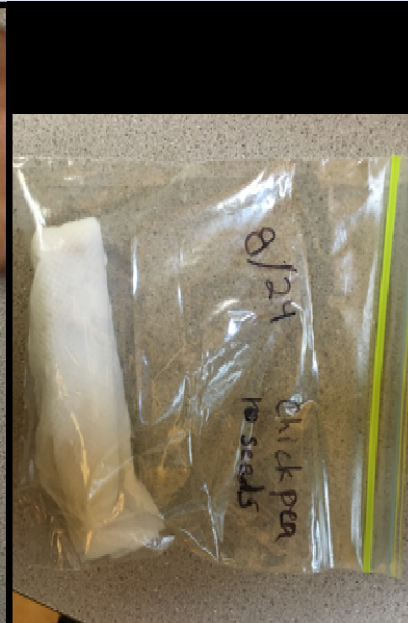
2. Gently wet until paper towel is damp but not dripping wet



3. Pinch both ends and carefully roll in a tube shape



4. Fold as needed to fit in container



5. Place in a container to maintain moisture and label (species, date, and number of seeds)

# Practice reading viability tests

The following slides will provide you with opportunities to practice reading the various types of seed viability tests.



# ROLLED TOWEL TEST



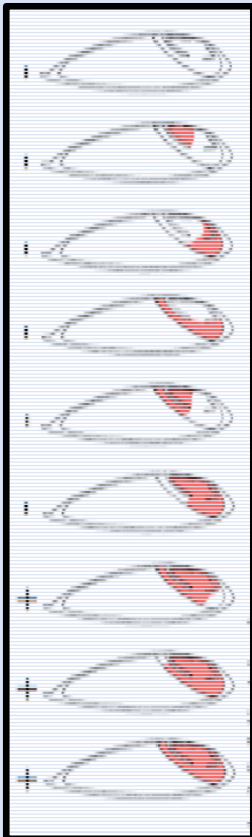
Viability = ( $\#$  normal, germinated seeds /  $\#$  total seeds)  $\times$  100

# ROLLED TOWEL TEST

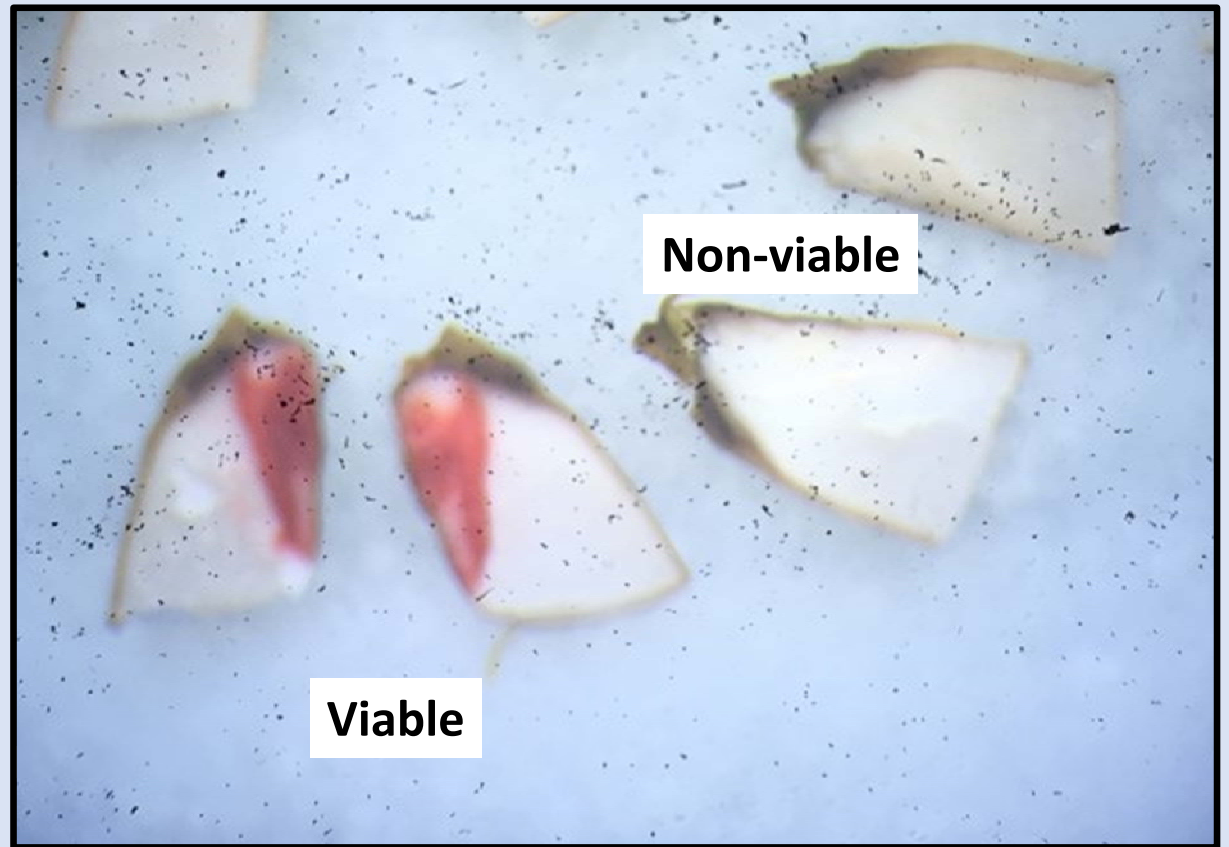


$$\text{Viability (\%)} = (8 / 10) \times 100 = 80\%$$

# TZ SEED VIABILITY TEST

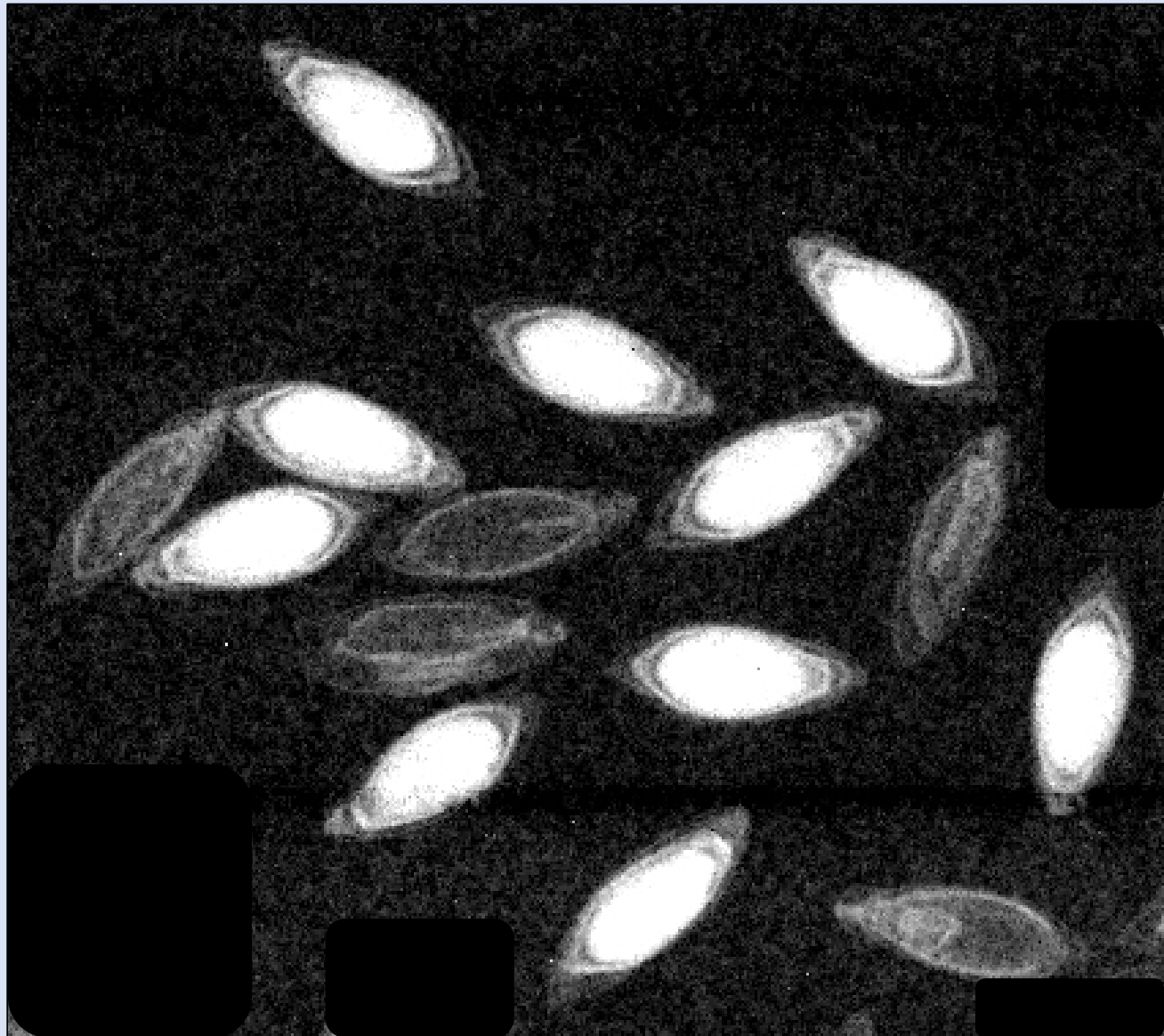


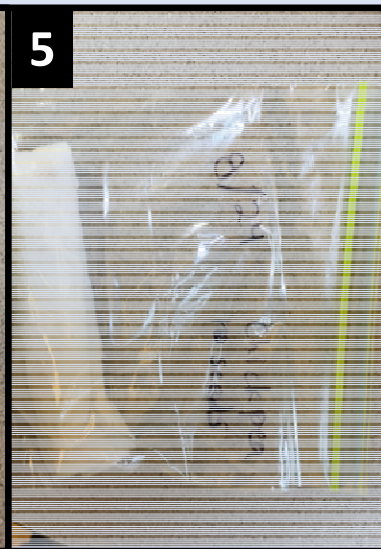
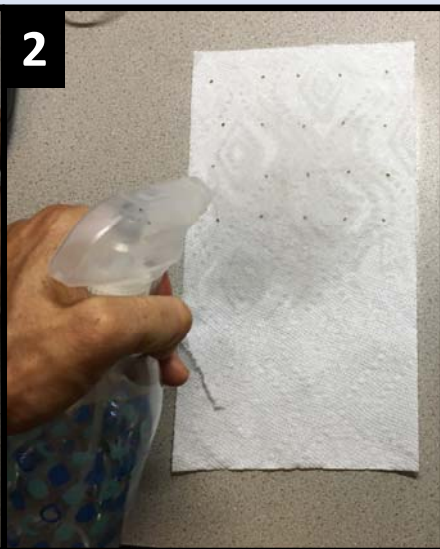
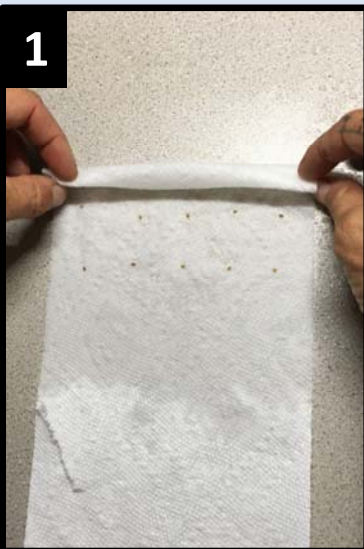
# TZ SEED VIABILITY TEST

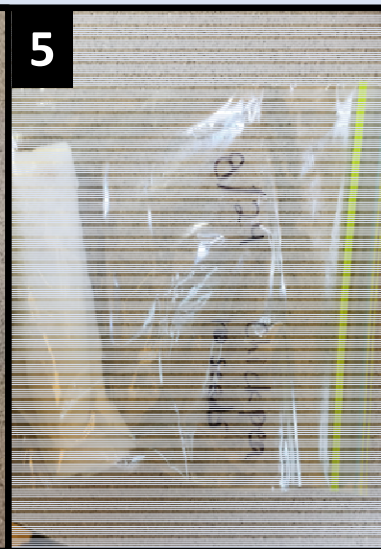
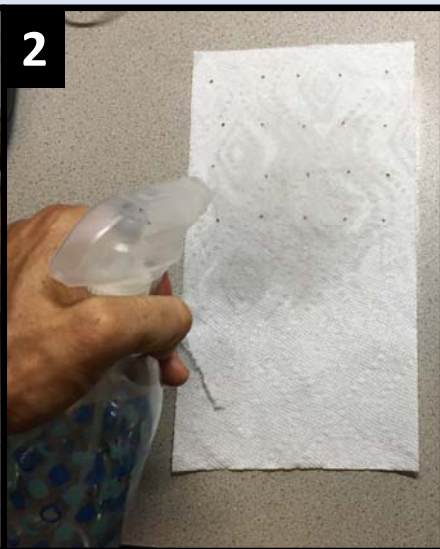
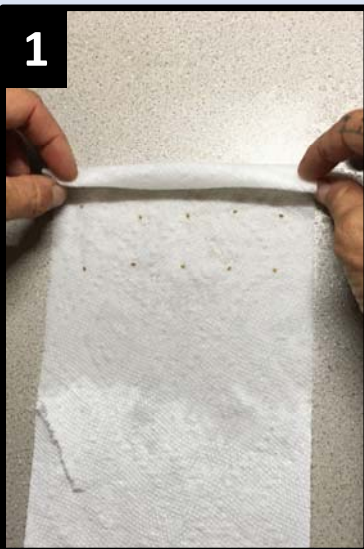


# X-RAY ANALYSIS

- X-ray photographs of seeds
- Filled or empty seeds
- Not a direct measure of viability
- Non-destructive



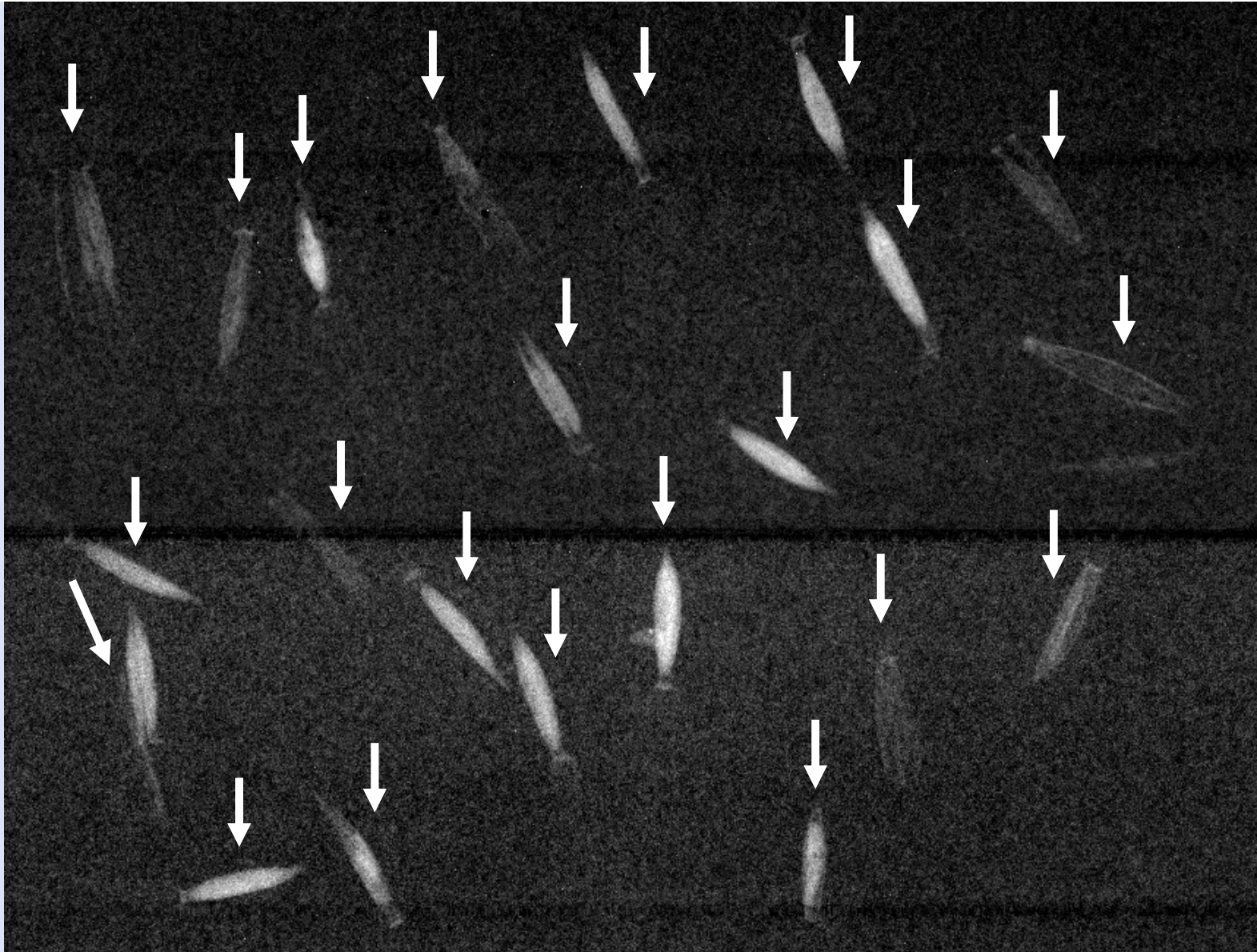


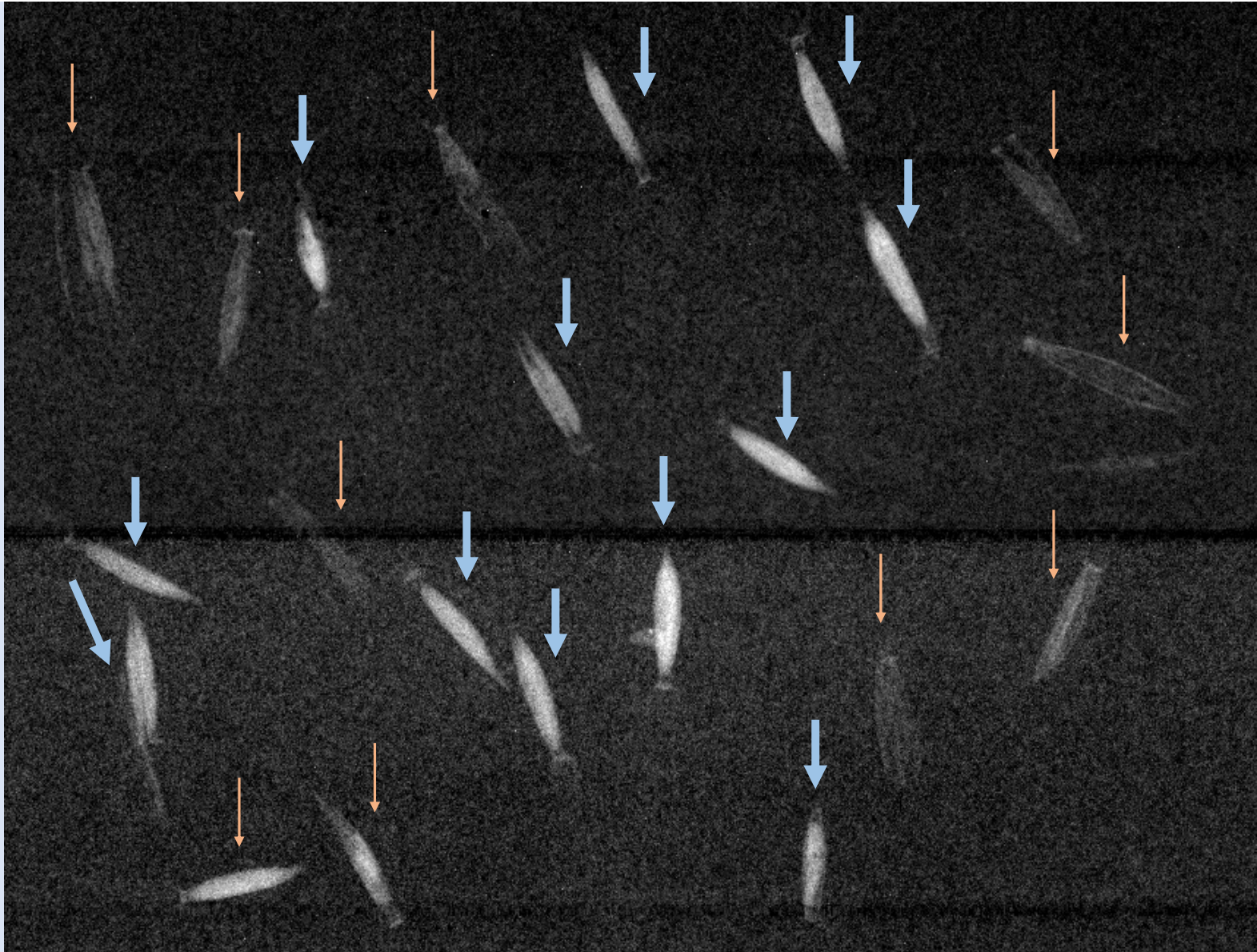












# Lab exercise

- Read the results for the TZ and rolled paper towel tests in the images provided by your lab instructor.
- Calculate the viability for each seed lot and graph the viability of both viability tests for all four seed lots in the same graph.
- Provide a summary of the results and discuss the experience of reading each type of viability test. Be sure to indicate if you can draw the same conclusions about the seed lots with both test methods.