LAB 2A

Are corn seeds Alive?

Materials: Safety goggles

 10 mL graduated cylinder

 2 petridish halves (tetrazolium test)

 2 petridishes with lids (germination)

 Forceps

 Marker

 Paper towels

 Parafilm or tape

 Scalpels

 Filter paper

 20 mL tetrazolium reagent (1%)

 Soaked corn seeds (50 type I and 50 type II)

# Procedure

# PART A Tetrazolium Test

1. Markthe outside bottom of one petri-dish half *type* *I* and the outside bottom of the other perti- dish half *type II*.
2. Obtain 5 corn seeds of type I. Using the scalpel, cut each kernel lengthwise down the middle, as shown in figure 2A.1a in your textbook. The seeds may have been treated with a pesticide. Handle them with forceps. You should be able to see the miniature plant (the embryo) inside the seed after it is cut.
3. Discard one half of each seed, and place the other half in the team’s petri dish with the cut surface down.
4. Cover the seed halves with 10 mL of tetrazolium reagent.

**WARNING: Tetrazolium is a contact *irritant* and *poison*. Avoid skin/eye contact; do not ingest. If contact occurs, flush affected area with water for 15 minutes; rinse mouth with water; call your teacher immediately.**

1. Repeat steps 2- 4 with 5 seeds of type II.
2. After 20 minutes, use forceps to remove the seed. Examine the cut surface of each seed for a color change. A red or pink color indicates a living substance.
3. Copy Table 2A.1 in your journal, and record your results there.

# PART B Germination Test

1. Obtain two petri dishes and place filter paper into each one. Wet the filter paper with distilled

water.

1. Place 5 *type I* corn seeds into the petri dish with wet paper towel.
2. Cover the seeds with another wet paper towel.
3. Put the lid on the petri dish.
4. Repeat steps 8-11 with 5 *type II* seeds.
5. Label each Petri dish either *type I* or *type II*. Place the petri dishes in a dark area designated by your teacher.
6. Wash your hands thoroughly before leaving the laboratory.
7. After 3 days determine the total number of seeds in each petri dish that have begun to germinate (grow). Record the data in the table.

TABLE 2A.1

Results of Tetrazolium Test and Germination Test on Corn Seeds

|  |  |  |
| --- | --- | --- |
|  | Tetrazolium Test | Germination Test |
|  | Type I seeds | Type II seeds | Type I seeds | Type II seeds |
| Team | Class | Team  | Class | Team | Class | Team | Class |
| # of seeds used |  |  |  |  |  |  |  |  |
| # of seeds viable or germinated |  |  |  |  |  |  |  |  |
| % of seeds viable or germinated |  |  |  |  |  |  |  |  |

# Analysis

1. For each treatment done per team and per class, calculate the % viability as follows and enter the % in the table.

# of seeds showing viability X 100 = % viability

Total # of seeds per treatment

1. In part A, if a color change indicates activity in living things, what can you conclude about the type I and type II seeds?
2. What evidence have you found that the type I seeds are alive? Not alive?
3. What evidence have you found that the type II seeds are alive? Not alive?
4. Discuss in class the results of both experiments. Does the information provided by your teacher change any of your conclusions? Explain your answer.
5. How does the percentage of viability as determined from the tetrazolium test compare with the percentage from the germination test?
6. Are the two percentages the same? If not, can you suggest a reason for their difference?
7. Is it possible to tell if seeds are alive by just looking at them? Why or why not?
8. What is the advantage of combining data from several teams in the class?