Data Analysis: Factors Affecting Seed Mass

A scientist investigated the factors that affect seed mass in the plant species *Desnodium poniculatum*. Some results of this study are summarized in the two tables below.

**Table 1**

|  |  |  |  |
| --- | --- | --- | --- |
| Daylight hours | Other variable | Average seed mass (in mg) of plants raised at: | |
| 23ºC | 29ºC |
| 14 | — | 7.10 | 5.63 |
| 14 | Leaves removed | 7.15 | 6.11 |
| 14 | Reduced water | 4.81 | 5.81 |
| 8 | — | 6.12 | — |

**Table 2**

|  |  |
| --- | --- |
| A. Number of seeds per fruit | Average seed mass (mg) |
| 1 2 3 4 5 | 6.62 6.28 5.97 6.00 5.59 |
| B. Position of seed in fruit\* | Average seed mass (mg) |
| 1 (closest to stem) 2 3 4 5 (farthest from stem) | 5.98 6.06 5.96 5.82 5.27 |
| \*Seeds closest to the stem mature first and are released first. | |

1. The data suggest that subjecting plants to which of the following conditions would result in the greatest seed masses?
   1. 8 hours of light, adequate water supply, and 23ºC
   2. 8 hours of light, decreased water supply, and 23ºC
   3. 14 hours of light, adequate water supply, and 23ºC
   4. 14 hours of light, decreased water supply, and 29ºC

What is your evidence?

1. Which of the following conclusions is NOT consistent with the data presented in table 2?
   1. The last seed released from the plant will have a greater mass than the first seed released.
   2. The first seed released from the plant will have a greater mass than the last seed released.
   3. The last seed released from the plant's fruit is the farthest from the stem.
   4. Seeds of the smallest mass are located farthest from the plant's stem.

What is your evidence?

1. Suppose some of the plants in the study had been exposed to 8 hours of sunlight and a temperature of 29ºC. If no other variables were introduced, which of the following would be the most reasonable prediction of the average mass of the seed(s) produced under those circumstances?
   1. 8.30 mg
   2. 7.10 mg
   3. 6.50 mg
   4. 4.85 mg

What is your evidence?