Addition of Gibberellin Through a Plants Lifespan (Wisconsin Fast Plant; *Brassica rapa)*

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Introduction:

- The effects of gibberellin have long been observed by Japanese rice farmers as a symptom of bacteria that causes abnormal height and seed production.[1]
- Internode elongation, hyponasty, and chlorosis were observed in *Coleus blumei*, *Antirrhinum majus*, and *Salvia splendens* (order Lamiales)[2], and elongated epicotyl and early internodes were observed in pea plants when treated with gibberellin.[3]
- The application of gibberellin to the bases of different cultivars of *Brassica rapa ssp.* regularly resulted in abnormally shaped and sized tubers, and increased epicotyl growth.[4]
- A variety of vegetables have displayed an increased rate and percent germination when seeds were soaked in gibberellin.[5]
- Will the application of gibberellin in the first and second weeks of growth of Wisconsin Fast Plants (*Brassica rapa ssp.*) and differences in application method (spray vs. soil application) cause increased plant height and seend production?

Methods:

- We applied 10 ml of gibberellin solution to 20 plants after the first week of planting
  - 10 plants had the hormone applied directly to the soil, while the other 10 plants were sprayed with the hormone 6” inches away.
- Furthermore, we applied 10 ml of gibberellin solution to another 20 plants two weeks after planting.
  - 10 plants had the hormone applied directly to the soil, while the other 10 plants were sprayed with the hormone 6” inches away.
- Our 5th group consisted of 10 plants that were not treated with any hormone after planting to serve as our control.

X1	X2	A1	A2	B1	B2	C1	C2	D1	D2
X3	X4	A3	A4	B3	B4	C3	C4	D3	D4
X5	X6	A5	A6	B5	B6	C5	C6	D5	D6
X7	X8	A7	A8	B7	B8	C7	C8	D7	D8
X9	X10	A9	A10	B9	B10	C9	C10	D9	D10
CONTROL		GSPRAY_1		GSOIL_1		GSPRAY_2		GSOIL_2	

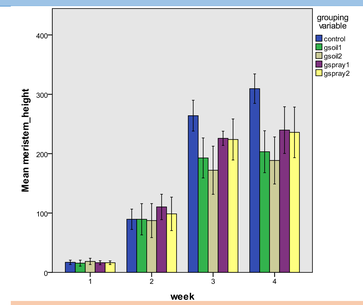

Figure 1: Represents the average measured height (mm.) from soil to apical meristem through 4 weeks after planting.

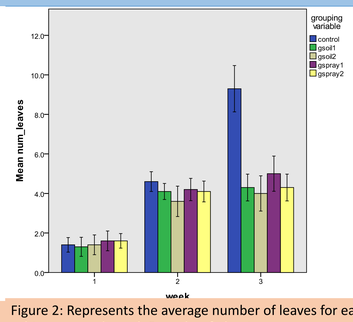

Figure 2: Represents the average number of leaves for each subject group through 3 weeks of planting.

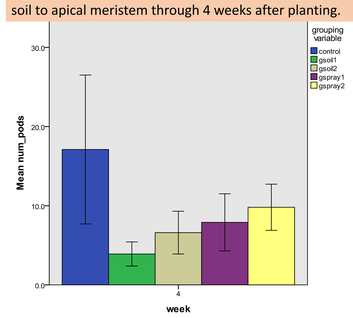

Figure 3: Represents the average number of mature pods for each group four weeks after planting.

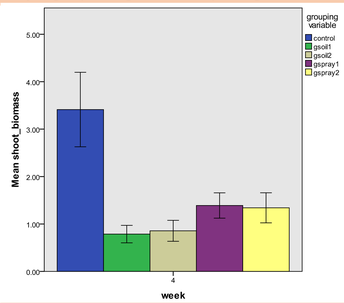

Figure 4: Represents the average shoot biomass (grams) for each group four weeks after planting

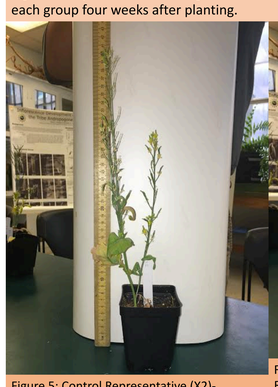

Figure 5: Control Representative (X2)- height=308 mm, num_pods=12, shoot biomass=3.6g (w4); num_leaves=9 (w3)

Figure 6: Gibberellin Spray Week One Representative (A5)- height=237mm, num_pods=13, shoot biomass=1.34g (w4); num_leaves=4 (w3)

Figure 7: Gibberellin Soil Week One Representative (B9)- height=187mm, num_pods=4, shoot biomass=0.57g (w4); num_leaves=3 (w3)

Figure 8: Gibberellin Spray Week Two Representative (C8)- height=263mm, num_pods=12, shoot biomass=2.16g (w4); num_leaves=4 (w3)

Figure 9: Gibberellin Soil Week Two Representative (D7)- height=210mm, num_pods=6, shoot biomass=0.84g (w4); num_leaves=5 (w3)

Results:

- The number of leaves in all of the trials were consistent with one another for weeks one and two, but in week three, the number of leaves in the control group were almost double.
- The meristem heights were consistent among weeks one and two, as well, but in weeks three and four, the meristem heights were significantly greater in the control group.
- There were almost twice as many seed pods in the control group in week four than in the other groups, and the final shoot biomass was approximately double in the control as well.

Discussion:

- Based on the results of the experiment, it would appear that gibberellin does not elicit any significant response in the Wisconsin Fast Plant in weeks one or two of growth. However, in the latter weeks of its growth cycle, the addition of gibberellin to a plant that has begun vegetative growth seems to be met with a negative response from the plant. In prior research, it has been observed that treating the seeds by soaking them in gibberellin before planting results in increased epicotyl growth. In these cases, the gibberellin promoted enzyme activity prior to and during seed germination. According to this study, it appears that the gibberellin disperses slowly in early plant growth. After it has dispersed, it appears that any additional gibberellin only serves to hinder the growth and reproductive development of the plants.

Literature Cited:

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