

Frequencies Maximizing the Edible Parts of Pea Sprouts – Preparing for the Coming Global Food Shortage –

Kyoto Municipal Saikyo High School

=Backgrounds=

- Few studies have yet shown that sound affects plant's growth.
- Some studies have investigated the effect but haven't reached to the discovery of any mechanism.
- This research is expected to make contribution to improving the existing cultivation method.

=Methods=

- Control experiment . . . 3 times
- ※ Comparison: made only within the same terms.

<conditions> • @School building
 • 8:00 - 17:00 sound ON
 • Sound volume => 20

Three elements of sound

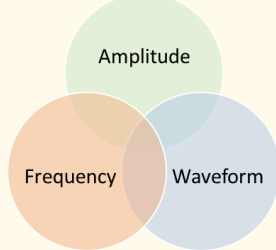


Fig.1

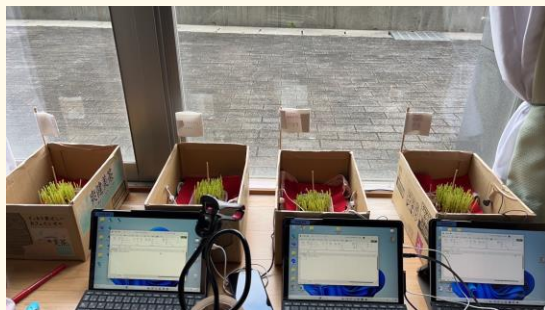
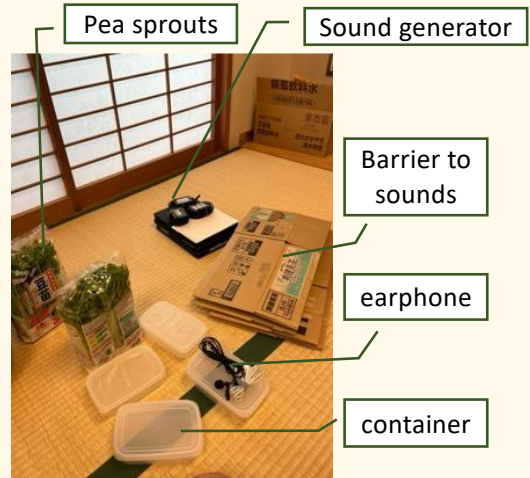


Fig.2



Fig.3



=Results=

<First term> Oct. 19 - 26

	0Hz	40Hz	400Hz	16000Hz
Average(cm)	7.39	6.71	6.31	7.68
SD	3.40	2.67	3.10	3.70
N=	99	105	106	101
P(T<=0.05)※		0.0028	0.000015	0.015

<Second term> Oct. 26 – Nov. 2

	0Hz	40Hz	400Hz	16000Hz
Average(cm)	3.66	2.74	2.62	3.33
SD	1.93	2.28	1.31	3.04
N=	92	101	97	92
P(T<=0.05) ※		0.0000086	0.00000036	0.077

<Third term> Nov. 2 - 10

	0Hz	40Hz	400Hz	16000Hz
Average(cm)	8.59	7.73	7.73	7.65
SD	7.71	8.04	6.68	3.04
N=	90	117	122	119
P(T<=0.05) ※		0.015	0.010	0.000034

※ P= Probability value (Indicator of significant difference)

=Conclusion=

- Lower frequencies gave negative impacts on the pea sprouts' growth.
- Lower frequencies are similar to the sound of insects, thus may have inhibited growth.
- 16000Hz showed little significant effect, so pea sprouts may have a limit to the frequencies they can perceive.

=Future goals=

- To prove the mechanism of low frequencies effect on pea sprouts' growth
- To show the relationship between frequency and other plants' growth
- To combine with organic cultivation methods using ultrasound