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Introduction and Objective

- A solar farm requires a significant quantity of land for solar panel installation and it is expected to compete for land with agriculture.
- The idea of growing crops below the solar panel has recently become popular.
- Objective:** to investigate the possibility of crop production under solar panel on lettuce growth and yields

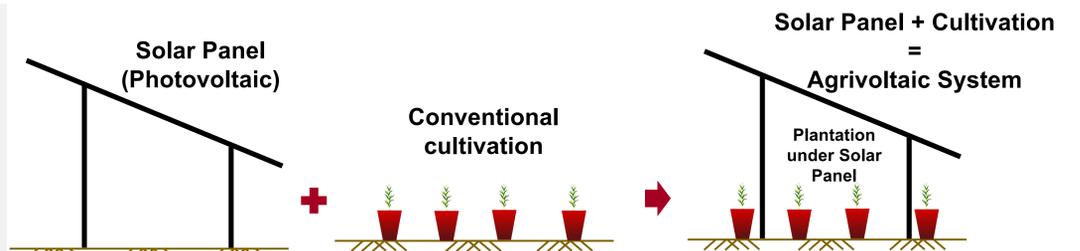
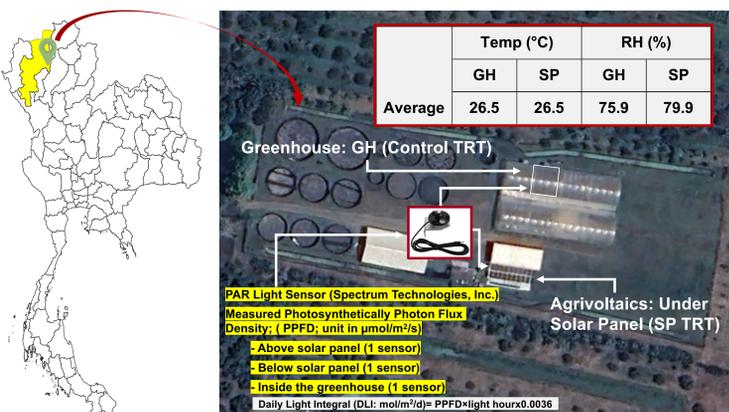


Fig 1. Conceptualization of the Agrivoltaic system

Study areas and experimental setup

1 Study area: Chiang Mai province, Northern Thailand in November 2022



2 Two growing systems



3 Selected varieties for comparative measurement



4 Measured parameters: Every 7 days

- Plant height and plant width
- SPAD values
- Fresh weight



Results

PPFD and DLI

- Average PPFD and DLI values showed the same trends during the study periods (Fig. 2a and b).
- The average PPFD and DLI values in the GH TRT (PPFD=538 $\mu\text{mol}/\text{m}^2/\text{s}$ and DLI=22 $\text{mol}/\text{m}^2/\text{d}$) were higher than those in the SP TRT (PPFD=404 $\mu\text{mol}/\text{m}^2/\text{s}$ and DLI=16 $\text{mol}/\text{m}^2/\text{d}$).

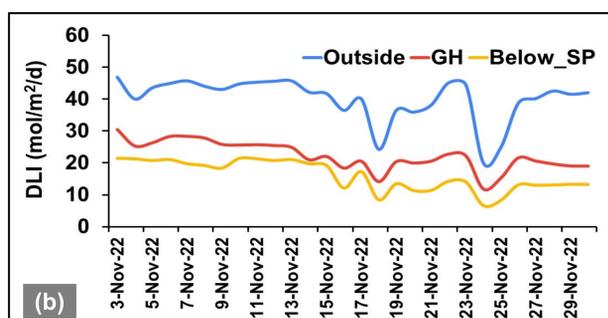
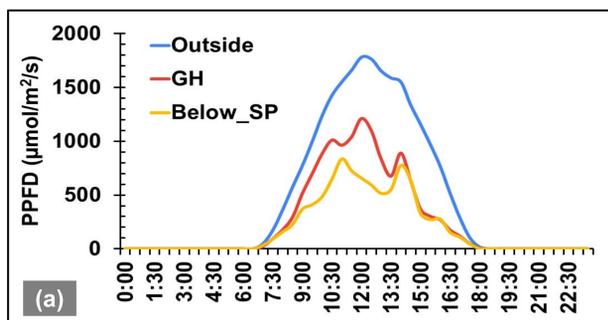


Fig 2. Average values of PPFD and DLI

Average values of plant height, plant width, SPAD and fresh weight

- Fig. 3a-b shows higher trends in plant height and width during the study periods of both GO and BH. At maturity (Week 4), GO-SP had the highest values for plant height and width when compared to the others.
- BH had higher values of SPAD in comparison to GO. The SPAD values measured in the SP treatment were lower than those in the GH treatment (Fig. 4a).
- At maturity (Week 4), the highest and lowest values of fresh weight were observed in GO_SP (41.8 g/plant) and BH_SP (25.4 g/plant), respectively (Fig. 4b).

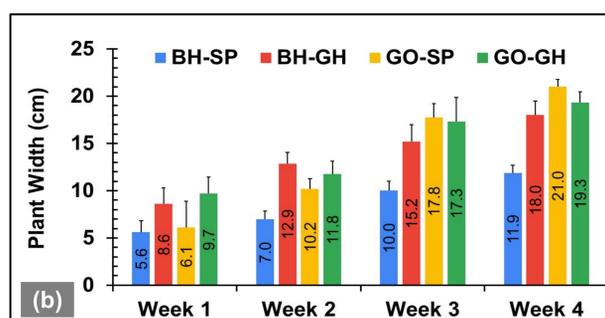
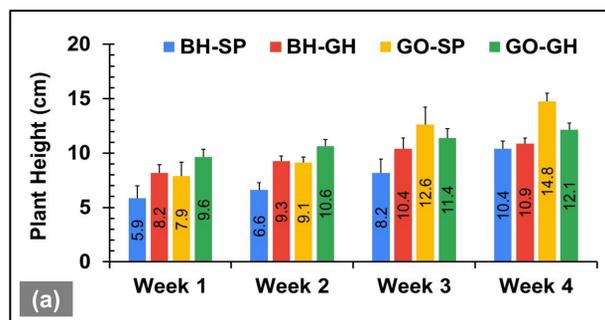


Fig 3. Average plant height and width values

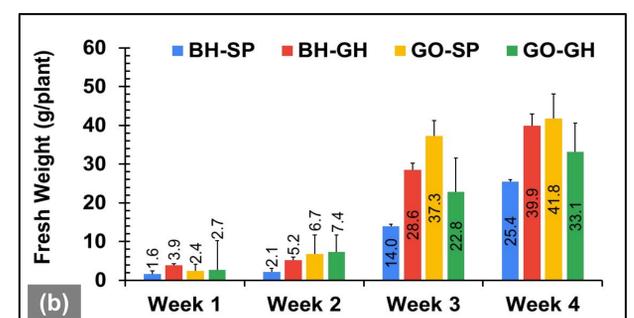
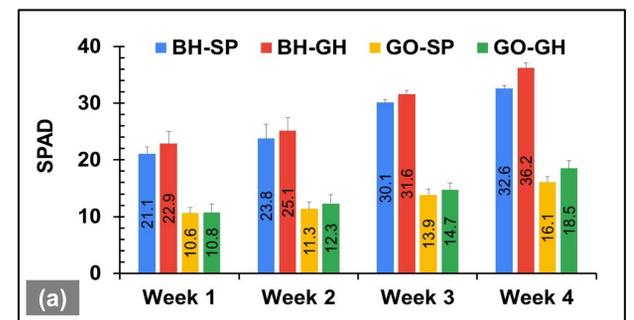


Fig 4. Average values of SPAD and fresh weight

Conclusion and Acknowledgements

Conclusion

- Sunlight availability under the solar panel was adequate for growing lettuce.
- Further investigation is needed for other crops. Crop selection to grow under the solar panel is a must due to crop characteristics and solar panel installation.

Acknowledgements

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