

## Purpose of Research

— Biochar, a carbon-rich material derived from biomass, has both soil-improvement and carbon-sequestration effects, and its use is being promoted to realize sustainable agriculture. This study aims to enhance crop quality through the effects of biochar and to construct a carbon cycling model. Especially, our previous cultivation tests confirmed that spinach sugar content was increasing.

## Summary of Research

In this study, spinach cultivation experiments are being conducted at ECA Organic Farm (Nagareyama City) and in an agricultural greenhouse on our university campus. By measuring and analyzing soil gas concentrations, sugar content, spinach yield, and carbon content in spinach and biochar, we quantitatively evaluate the improvement in crop quality and the effects on carbon cycling induced by biochar. Moreover, using the cultivation tests, we conduct an impact analysis based on the LCA methodology.



A: Test Field (ECA Organic Farm, Nagareyama, Chiba)  
B: Greenhouse, C: Spinach

## Points

- Verification of effects through cultivation trials
- High-reproducibility quantification of carbon sequestration
- An impact analysis of LCA

## Future Developments

We are planning to launch a startup to move to the practical stage of expanding high-value-added agricultural products using biochar technologies. Moreover, through our challenges, we will contribute to reducing the eco-burden.

### Comparison with Conventional or Competitive Technologies

- ✓ The sugar content of the crops increases, and their yields are enhanced.

### Expected Applications

- ✓ Stable production performance of high-value-added agricultural products can be expected.

### Challenges in Implementation

- ✓ It is necessary to continue accumulating and analyzing empirical data. Using the data, we will develop the agricultural quality control system on AI technology.

### Looking for the collaborative companies

- ✓ We are looking for companies that support our research and development of biochar application technologies for agricultural products. Moreover, in the supply chain, a collaborator with cold technology to maintain its quality is sought.

■ Associated System	: N/A
■ Awards	: N/A
■ Intellectual Property	: N/A
■ Prototype	: N/A
■ Sample	: N/A