

# Investigating Crop Responses to Atmospheric Change (SoyFACE)

To discover the effects of atmospheric change on the agronomy and productivity of Midwestern crops as well as to find solutions that will lead to crops better adapted to this future.

Researchers from the USDA ARS and the University of Illinois at Urbana-Champaign created SoyFACE (Soybean Free Air Concentration Enrichment) to study the effects of elevated carbon dioxide, ozone, higher temperature, and altered soil water availability on crops in production field conditions.

This unique facility and the highly interdisciplinary research teams that it serves seek answers to important questions, including:

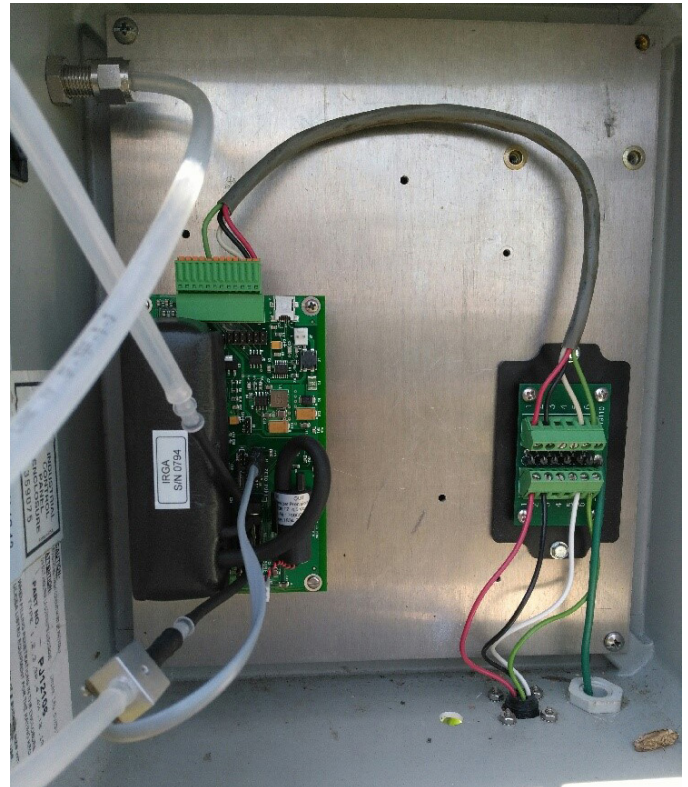
- What yield and quality changes will result with rising CO<sub>2</sub>, temperature, drought stress and ozone pollution?
- What genotypes and genes may be exploited to increase yield and maintain quality under the changed atmospheric conditions?
- What system changes will increase yields and maintain quality under the changed atmosphere?
- Will soil quality be degraded, and how can this be alleviated?
- Will rates of soil carbon deposition be increased, and what value might this have in terms of carbon credits?
- How will changes in CO<sub>2</sub>, temperature, drought stress and ozone impact insects and pathogens?



*This is an experimental "ring" in a soybean field. The SBA-5 is housed in the enclosure at the center and feeds data to the control box in the foreground. CO<sub>2</sub> is released from the green pipes forming the ring to control CO<sub>2</sub> levels in ambient air.*



Our facility has used SBA-4, and now SBA-5, analyzers for almost 20 years to measure and control carbon dioxide in the experimental “rings”. The SBAs measure carbon dioxide in the center of the ring and feed data to a control system, which determines how much carbon dioxide to add to reach the experimental set points. Using this system, researchers investigate how crops will respond to future atmospheric conditions.



The SBA-5s are stored in a custom, weather-proof housing and need infrequent maintenance despite being used in outdoor conditions.

*PP Systems would like to thank and acknowledge SoyFACE for providing the information contained in this application note. In particular, we would like to thank Jesse McGrath, Research Coordinator and SoyFACE Co-Directors Don Ort, UIUC and Lisa Ainsworth, USDA ARS.*

Learn more about SoyFACE: <https://soyface.illinois.edu/>



If you would like to learn more about this application or speak with one of our experienced technical staff, please feel free to get in direct contact with us via any of the contact information listed below:

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