



## Project: The Copter Based Greenhouse



### Contents and Objectives:

Manual crop mapping and single plant analyzing in greenhouse seem to be time consuming and labor-intensive task. There are issues which are possibly not visible to the naked eyes. Hence one of the solutions to overcome this problem is the use of sensors and multicopters to gather crop information at a low level of height to optimize plant production. On the other hand low altitude flight might affect the plants by altering the environment for instance by creation of wind by the rotating propellers. Vibration of the plants is one of the consequence.

Therefore in this project we want to find out, in which way a multicopter could be used in greenhouse production. Additionally we want to check if the turbulences caused by the copter influences plant growth. For the investigations we use a common small quadcopter (Perrot Drone) and specific control algorithms. The research takes place in the greenhouses at the Hochschule Osnabrück with different plants. We started our experiments with basil (*Ocimum basilicum*).

### Publications:

Fadami M. et al. 2014: Quadrocopter-Einsatz im Gewächshaus - Analyse der Luftturbulenzen. Kontaktstudientage, Hochschule Osnabrück, 07.11-08.11.2014.  
[http://www.blab-osnabrueck.de/paper\\_poster/copter\\_poster\\_kontaktstudientage\\_2014.pdf](http://www.blab-osnabrueck.de/paper_poster/copter_poster_kontaktstudientage_2014.pdf)

Fadami M., Rath T. 2014: Untersuchungen zum Einfluss der flughöhenabhängigen Bildauflösung und Systemvibration auf eine Quadrocopter basierte Pflanzenerkennung. 49. Gartenbauwissenschaftliche Jahrestagung, BHGL und DGG, Dresden 2014. Tagungsband S. 131.  
[http://www.dgg-online.org/tagungsbaende/Tagungsband\\_49\\_2014.pdf](http://www.dgg-online.org/tagungsbaende/Tagungsband_49_2014.pdf)

Rath T., Fadami M. 2013: Studies in Image Processing for Drone Copter Based Plant Detection - Vibration Analysis. CIGR Conference, Oct, 2013, Jeju, Korea-  
[http://www.blab-osnabrueck.de/paper\\_poster/copter\\_poster\\_jeju\\_2013.pdf](http://www.blab-osnabrueck.de/paper_poster/copter_poster_jeju_2013.pdf)

Fadami M. et al. 2012: Hardware components of a multicopter based plant imaging system. Computerised Image Analysis in Agriculture. Bornimer Agrartechnische Berichte, 78, 97-101. Institut für Agrartechnik Bornim, Potsdam-Bornim.

**Contact: [m.fadami@hs-osnabrueck.de](mailto:m.fadami@hs-osnabrueck.de)**