



RGB-Vegetationsindizes – Licht und Schatten

Friedrich Bartels

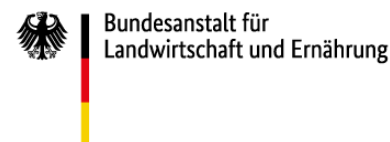
Landwirtschaftskammer Niedersachsen



Gefördert durch



Projektträger

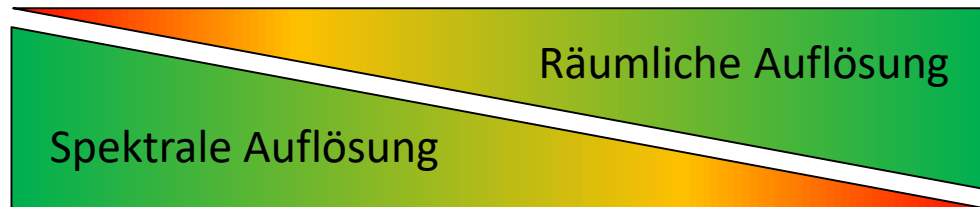
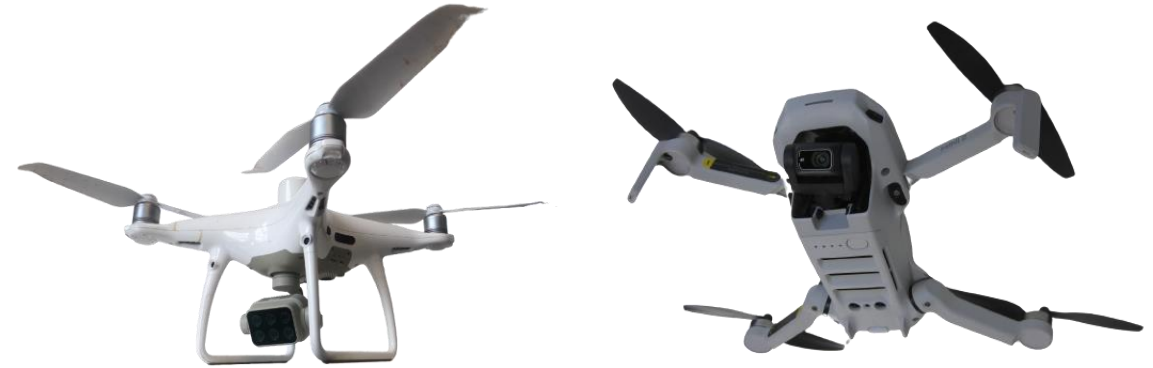


aufgrund eines Beschlusses
des Deutschen Bundestages



Warum RGB-Vegetationsindices?

Kostengünstige UAVs
Für Laien gut interpretierbare Bilder
Gut skalierbare Verarbeitung ohne teure Software



Normalized green red difference index (NGRDI)

$$\frac{GREEN-RED}{GREEN+RED}$$

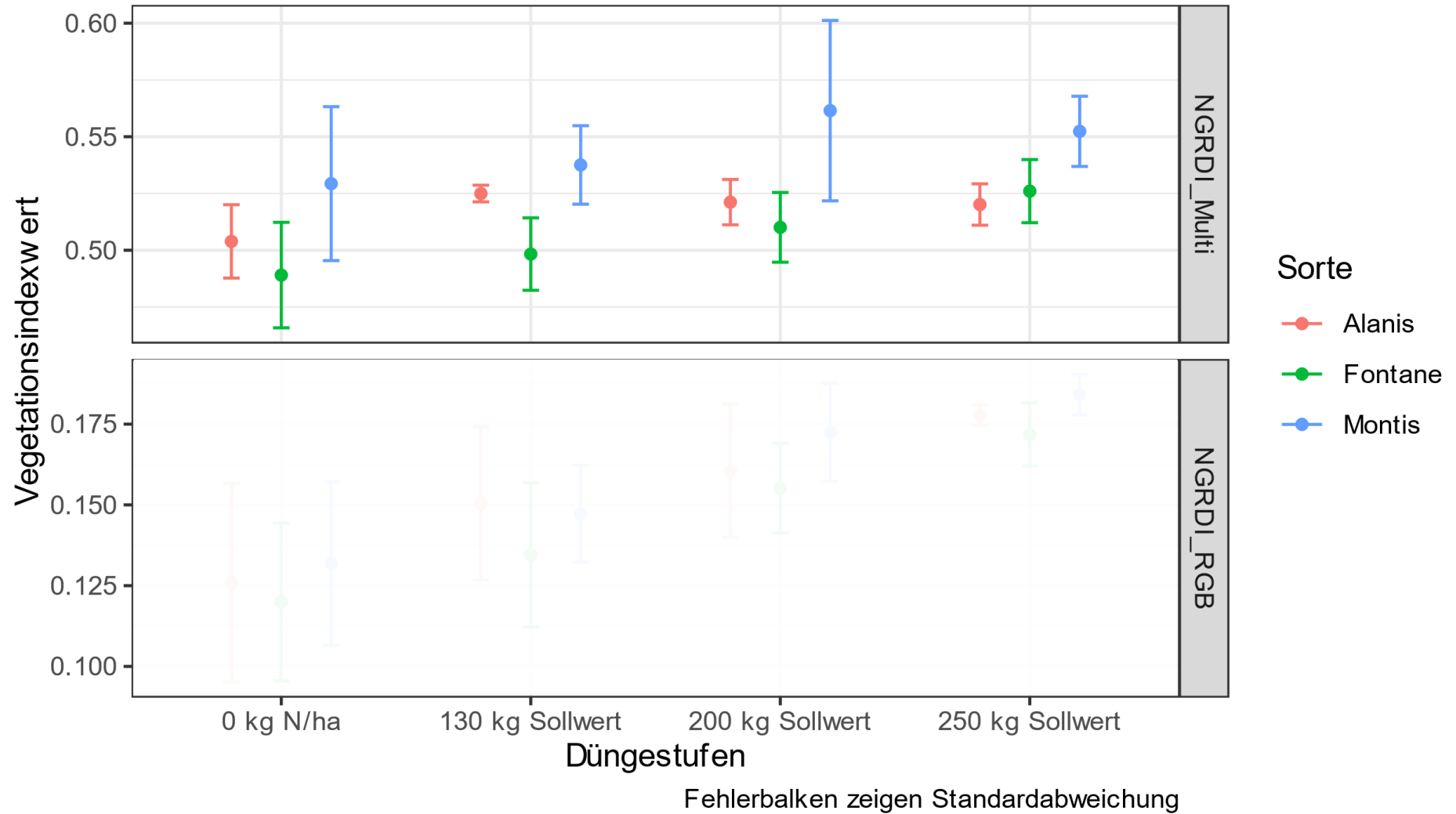
[indexdatabase](#)



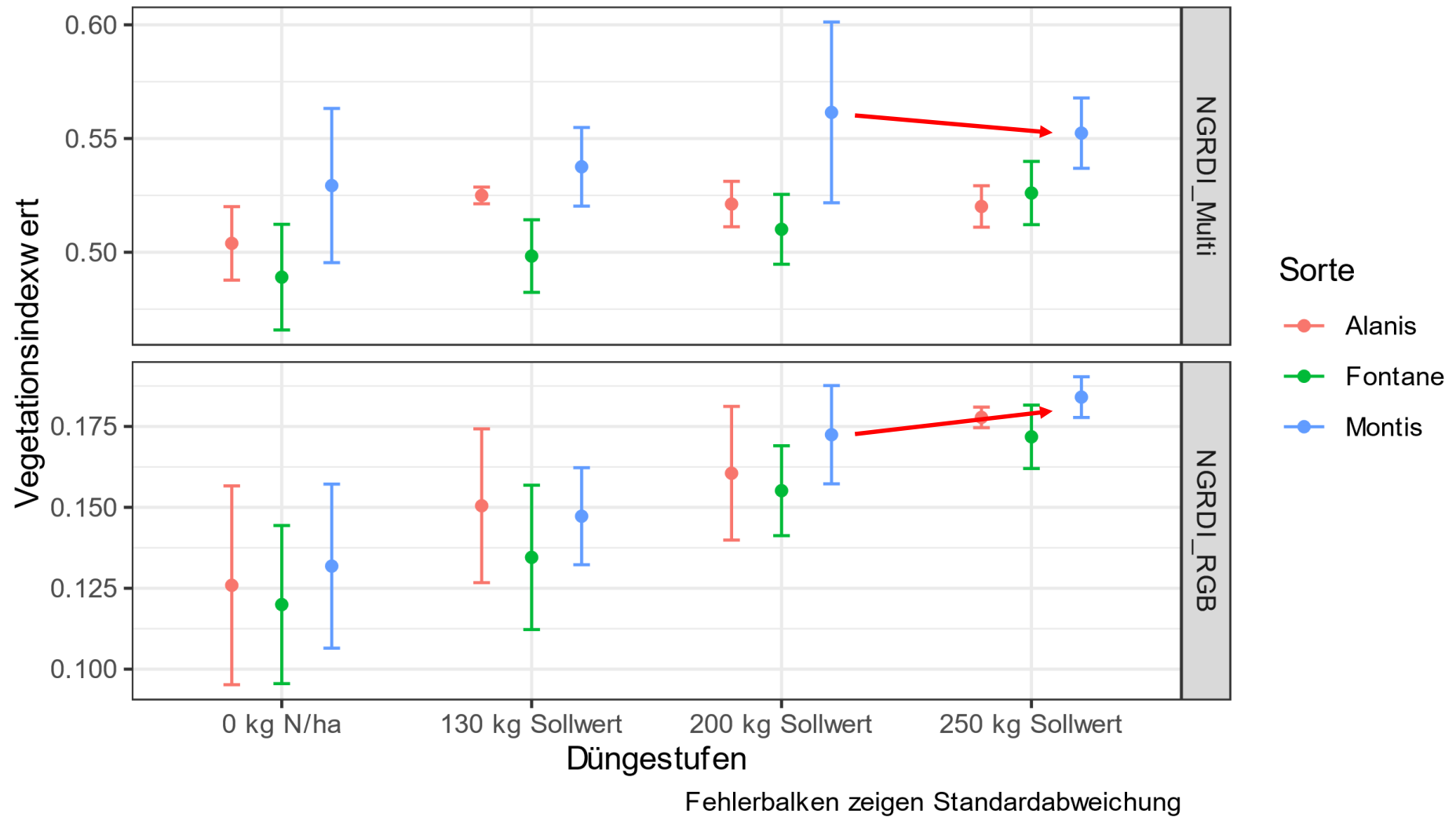
- Stickstoffdüngung in Kartoffeln
- 3 Sorten (Alanis, Fontane, Montis)
- 4 N-Düngestufen (0/130/200/250 kg/ha)

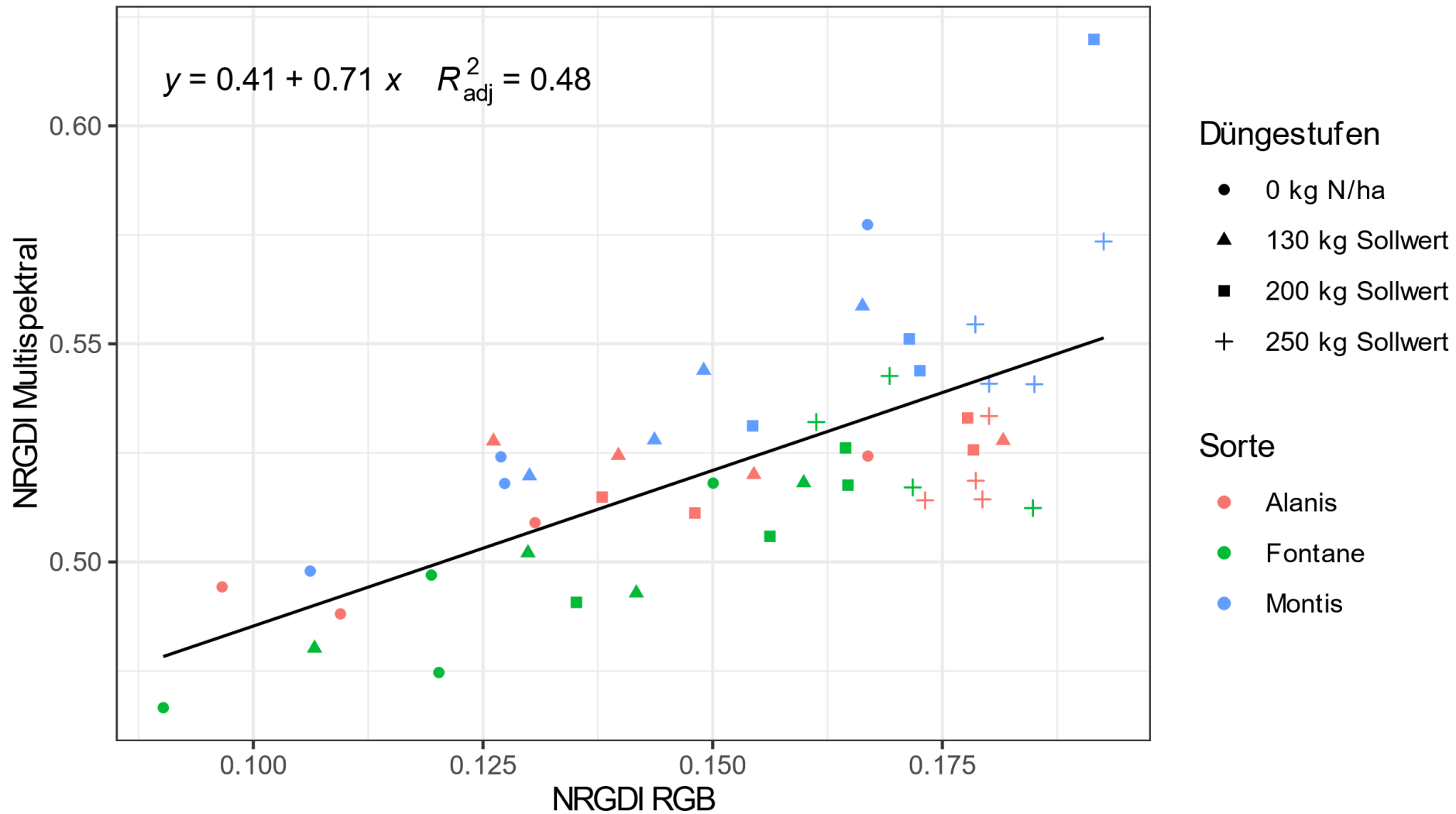


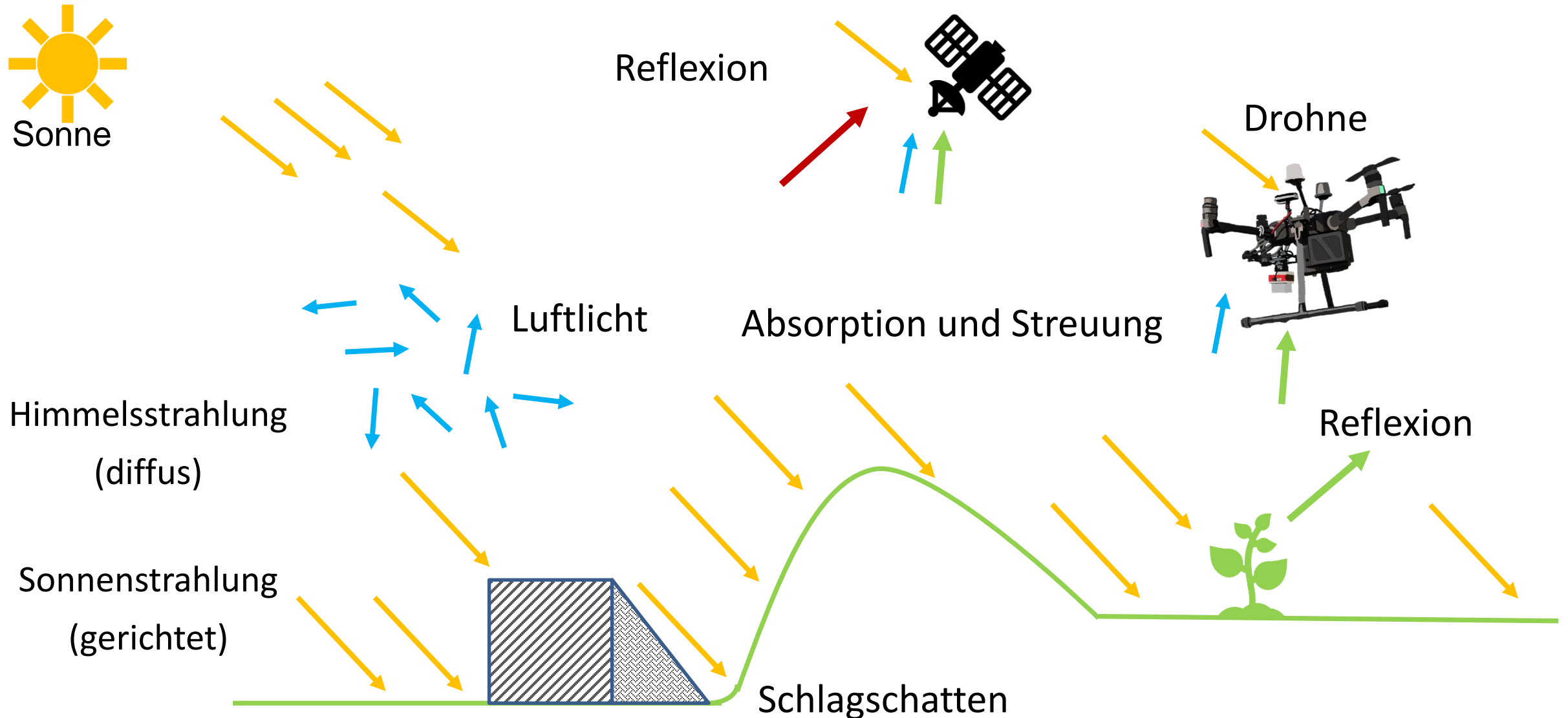
Vegetationsindices

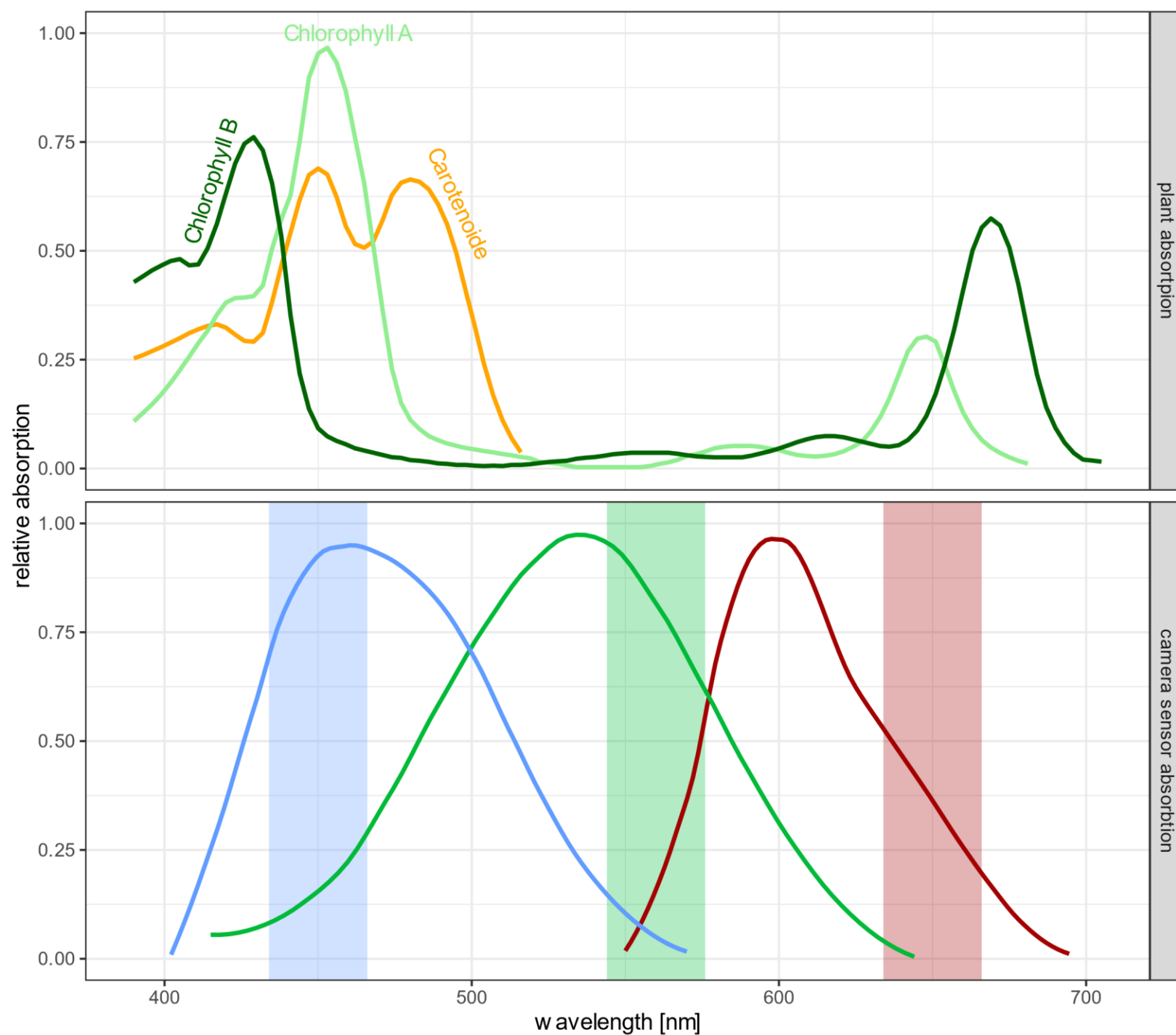


Vegetationsindices

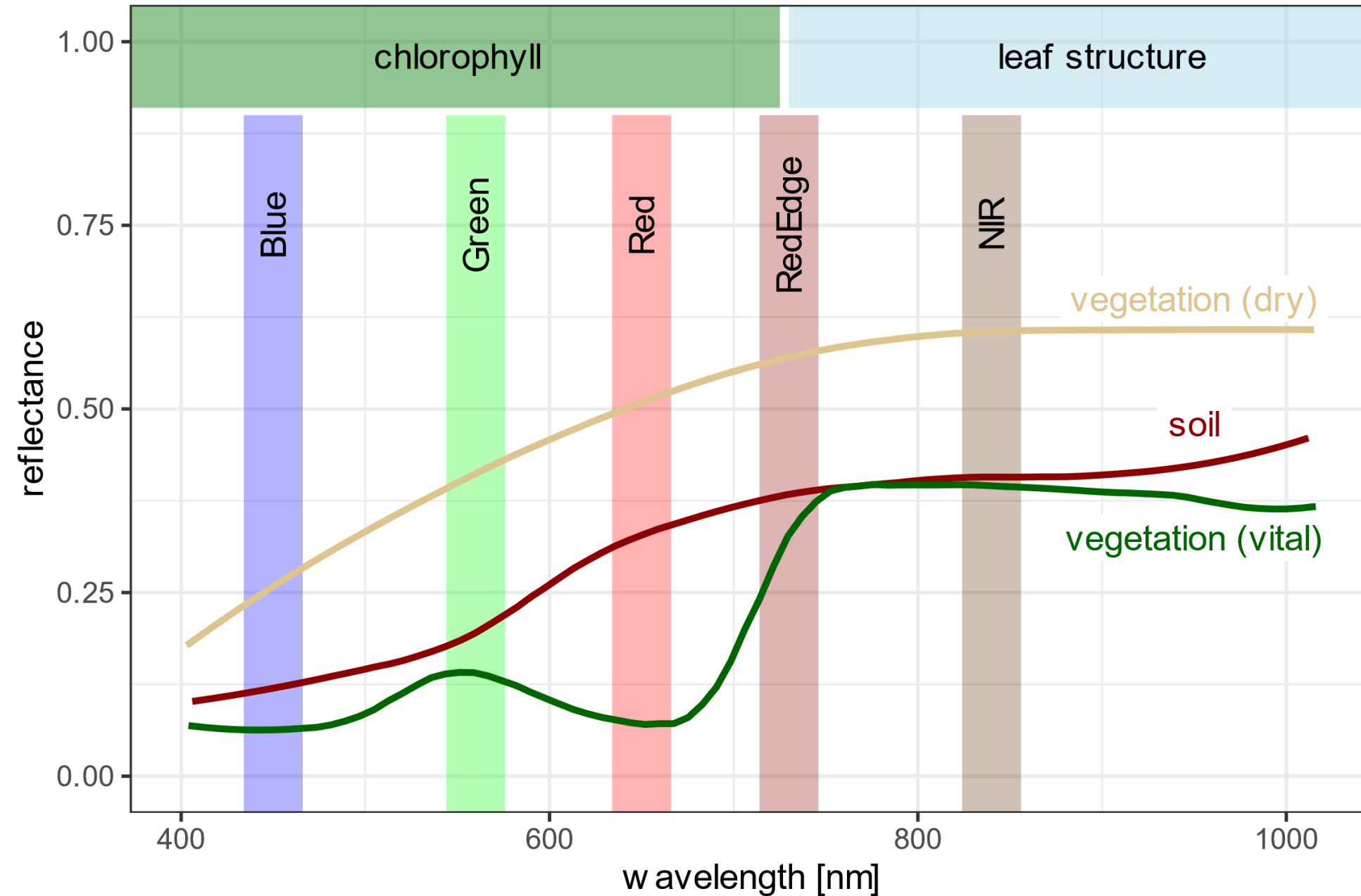








Verändert aus
[Kolláth et al. 2020](#)
[Guidi et al. 2016](#)

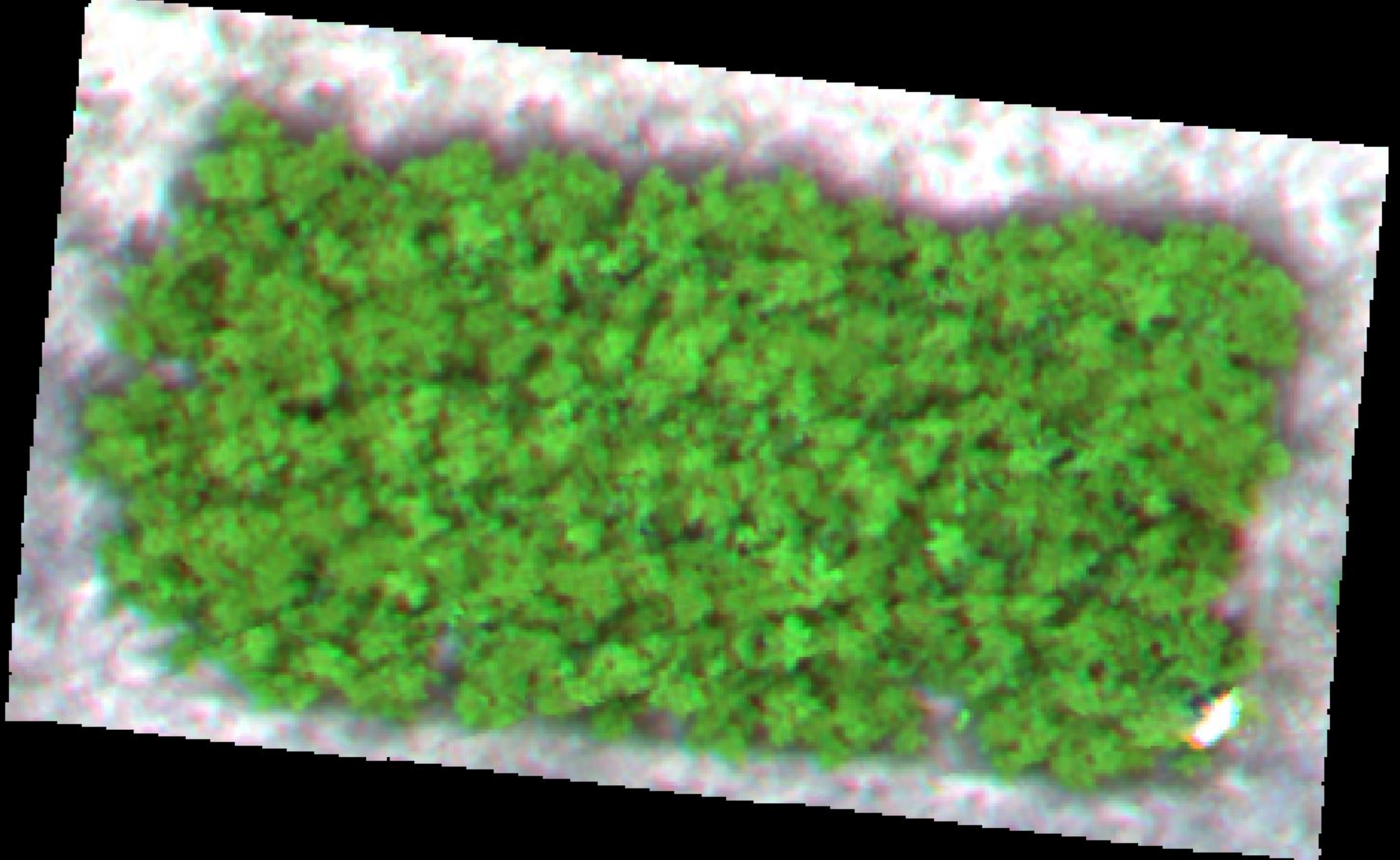


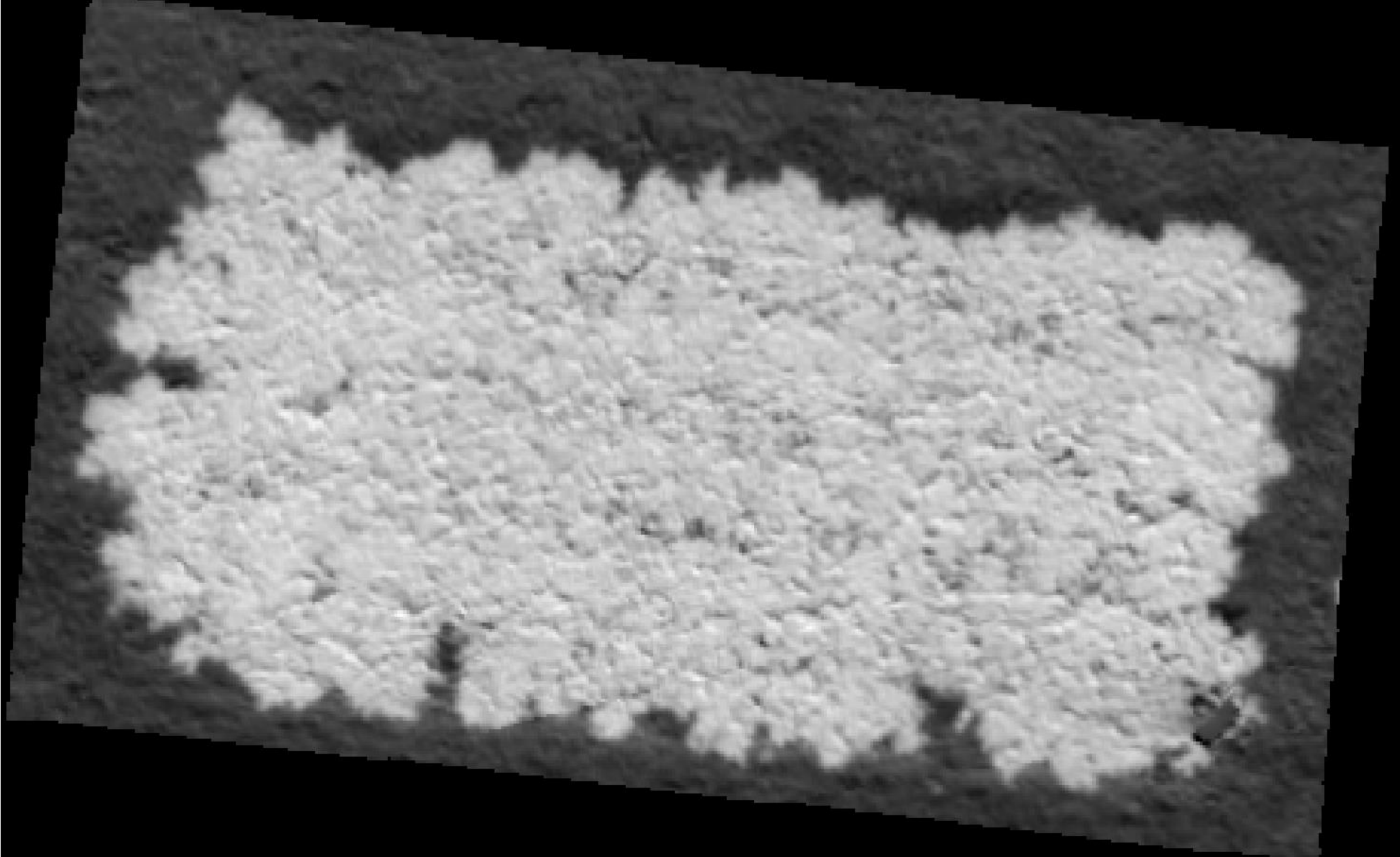
$$NDRE = \frac{(NIR - RE)}{(NIR + RE)}$$

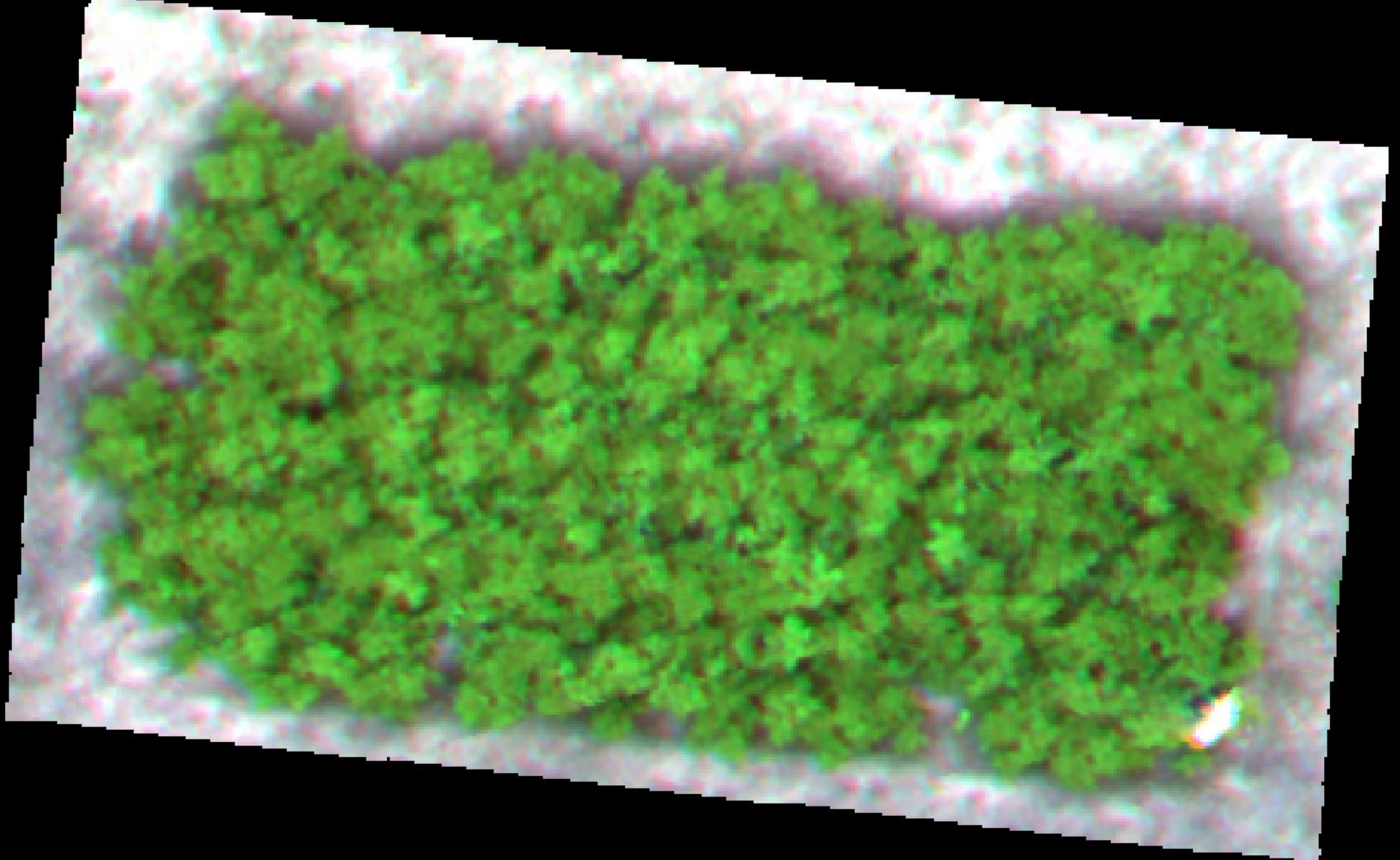
$$NRGDI = \frac{GREEN - RED}{GREEN + RED}$$

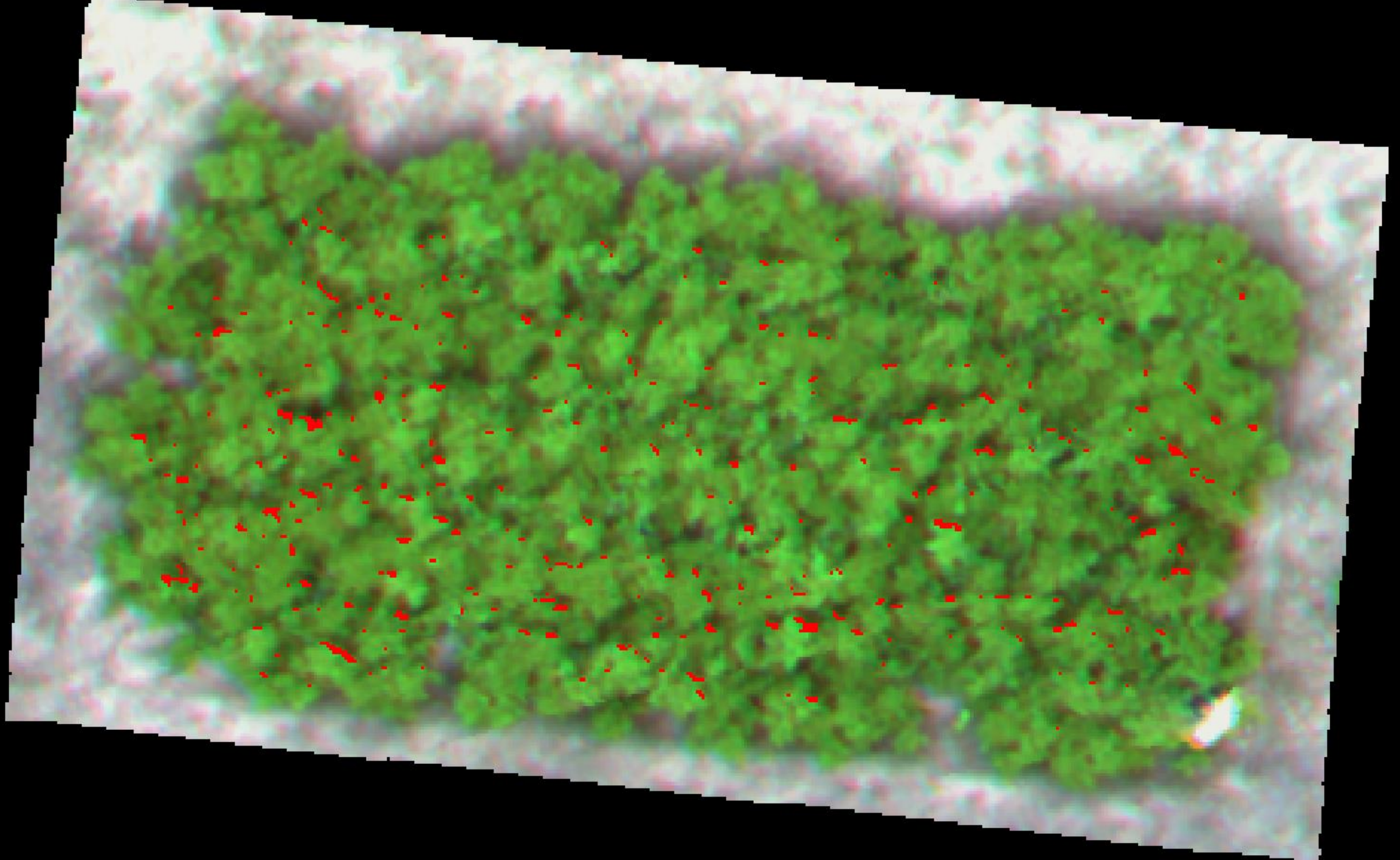
Verändert aus
[Blackbridge, 2014](#)





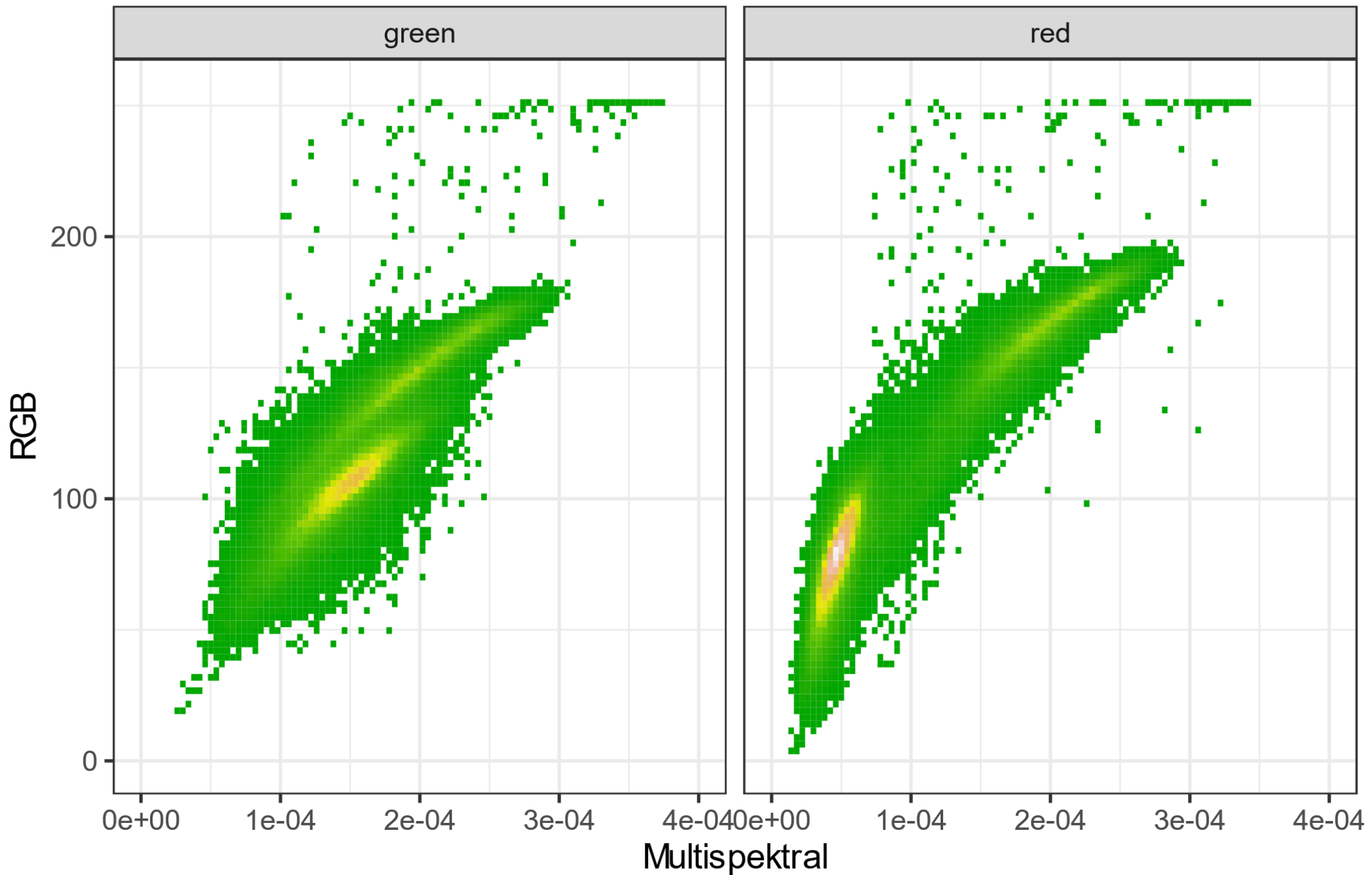


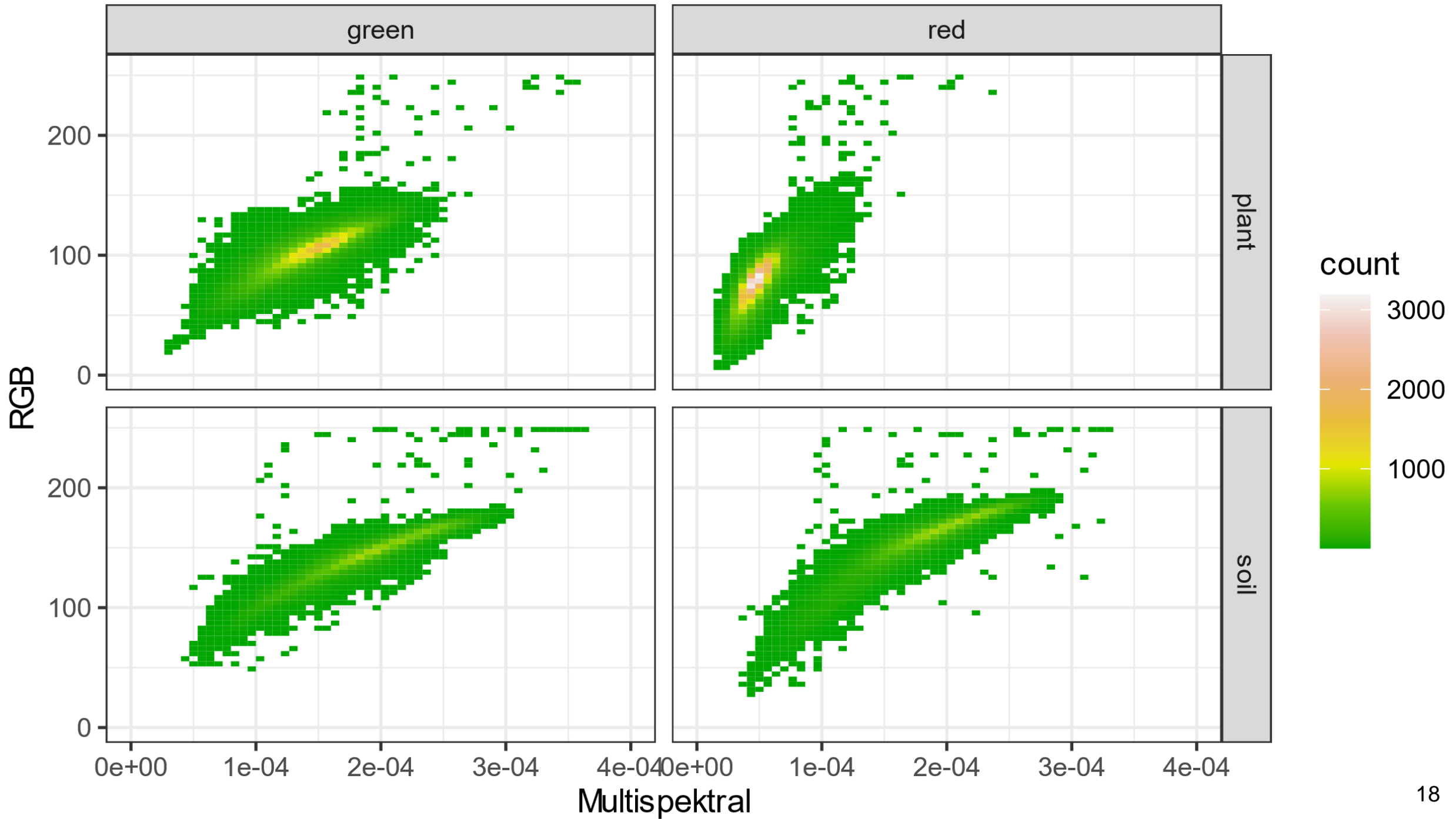


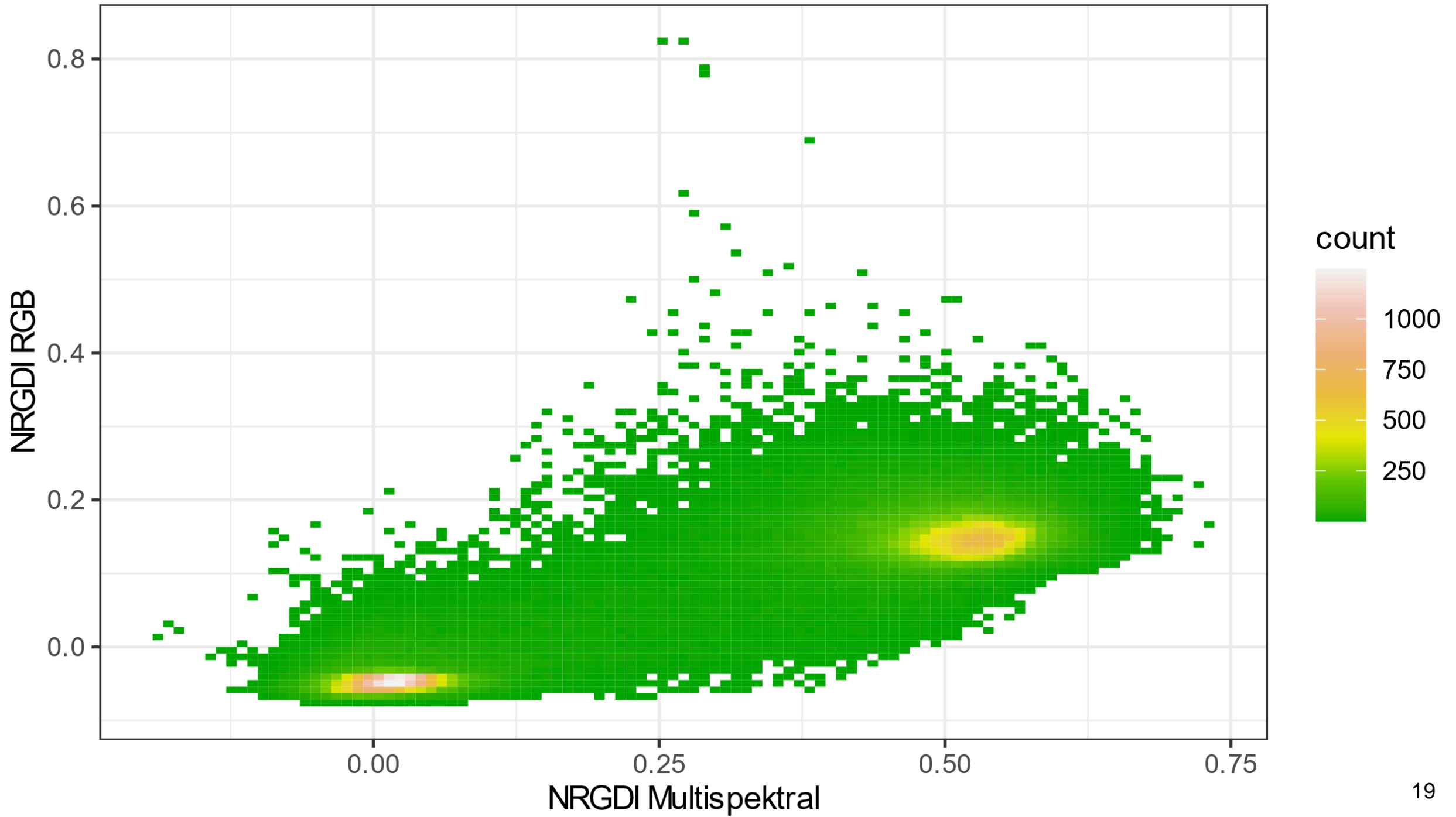






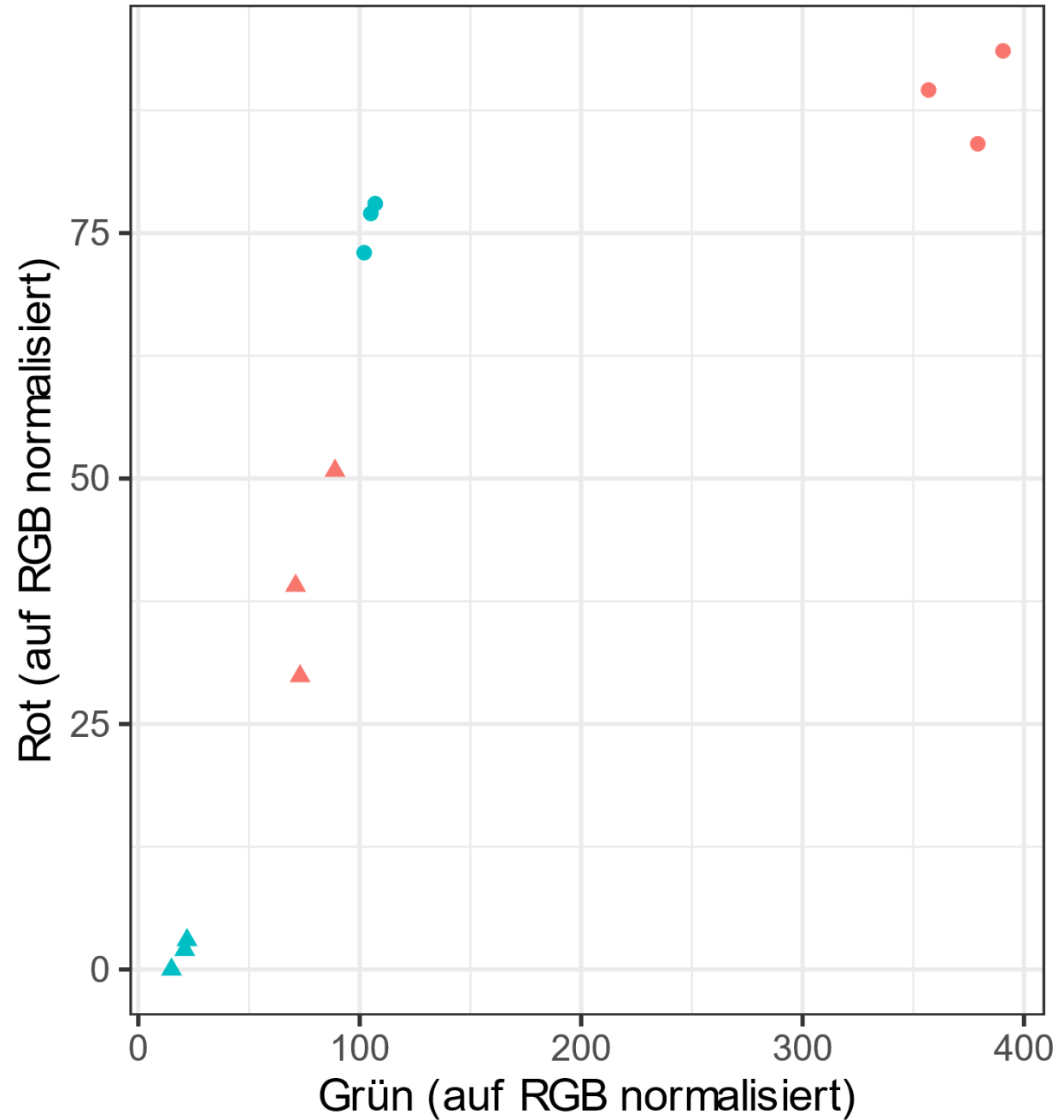






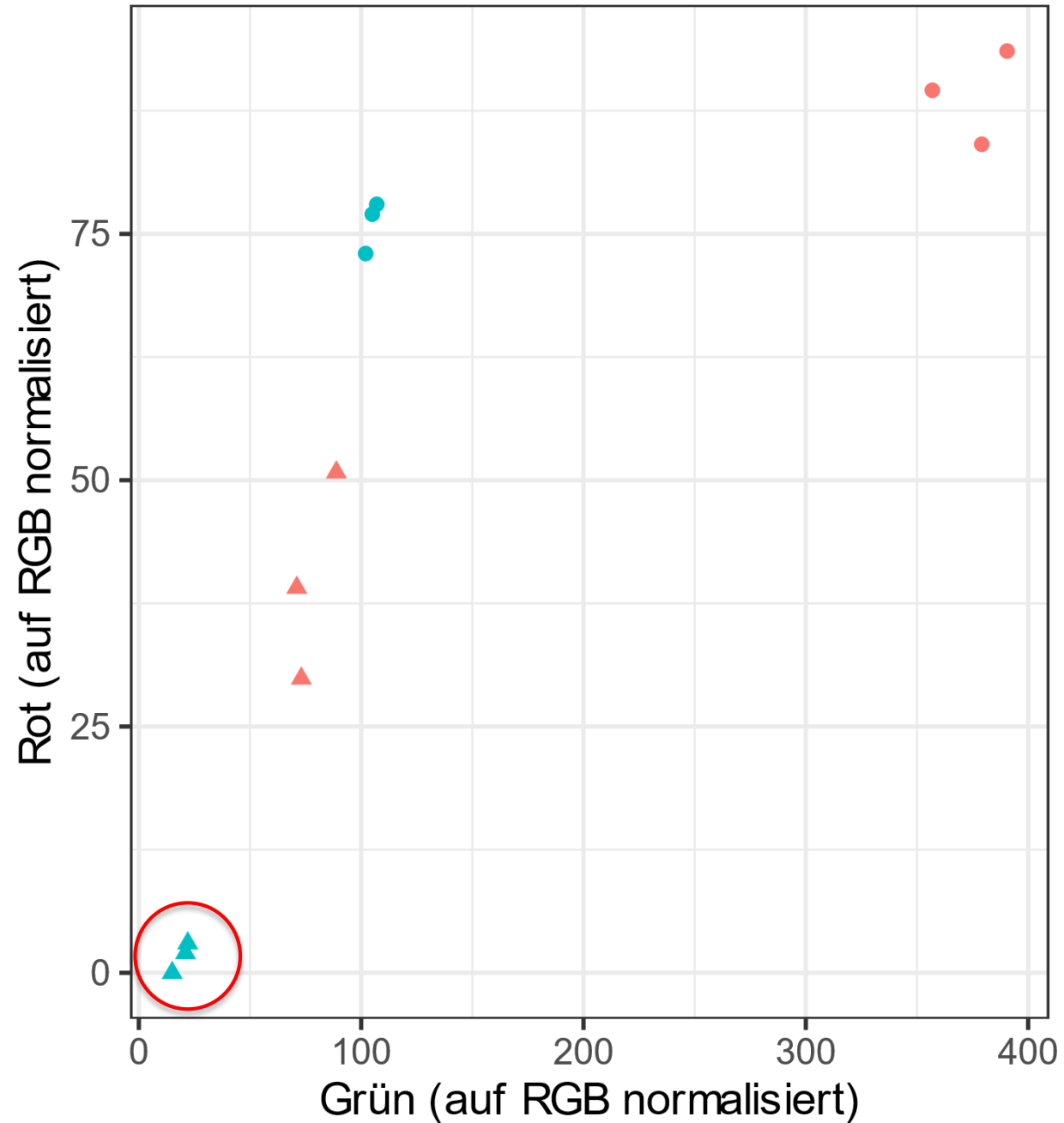


Sechs handverlesene Werte:



Sechs handverlesene Werte:

$$\lim_{RED \rightarrow 0} \left(\frac{GREEN - RED}{GREEN + RED} \right) = 1$$



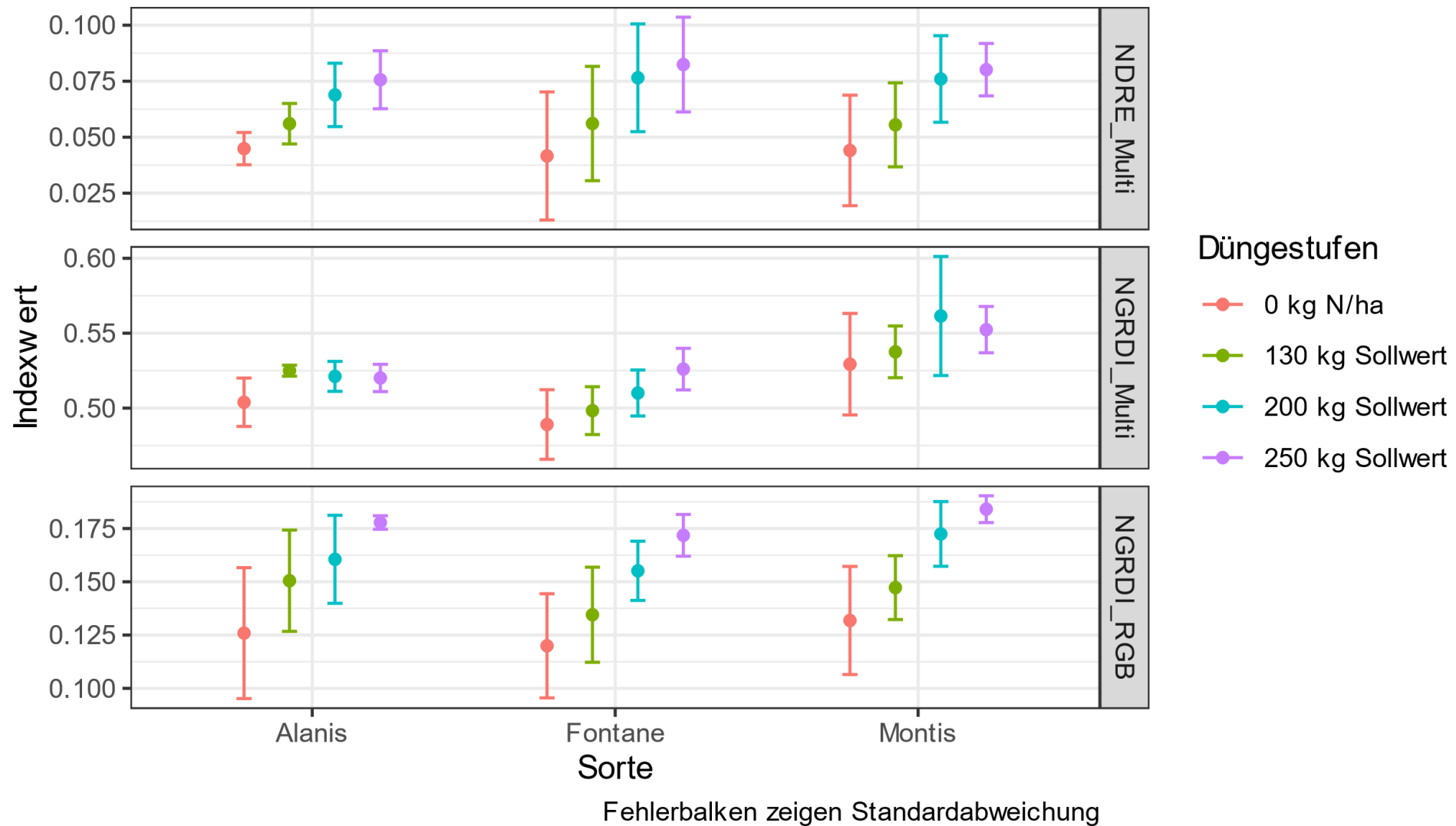
Sensor

- Multispektral
- RGB

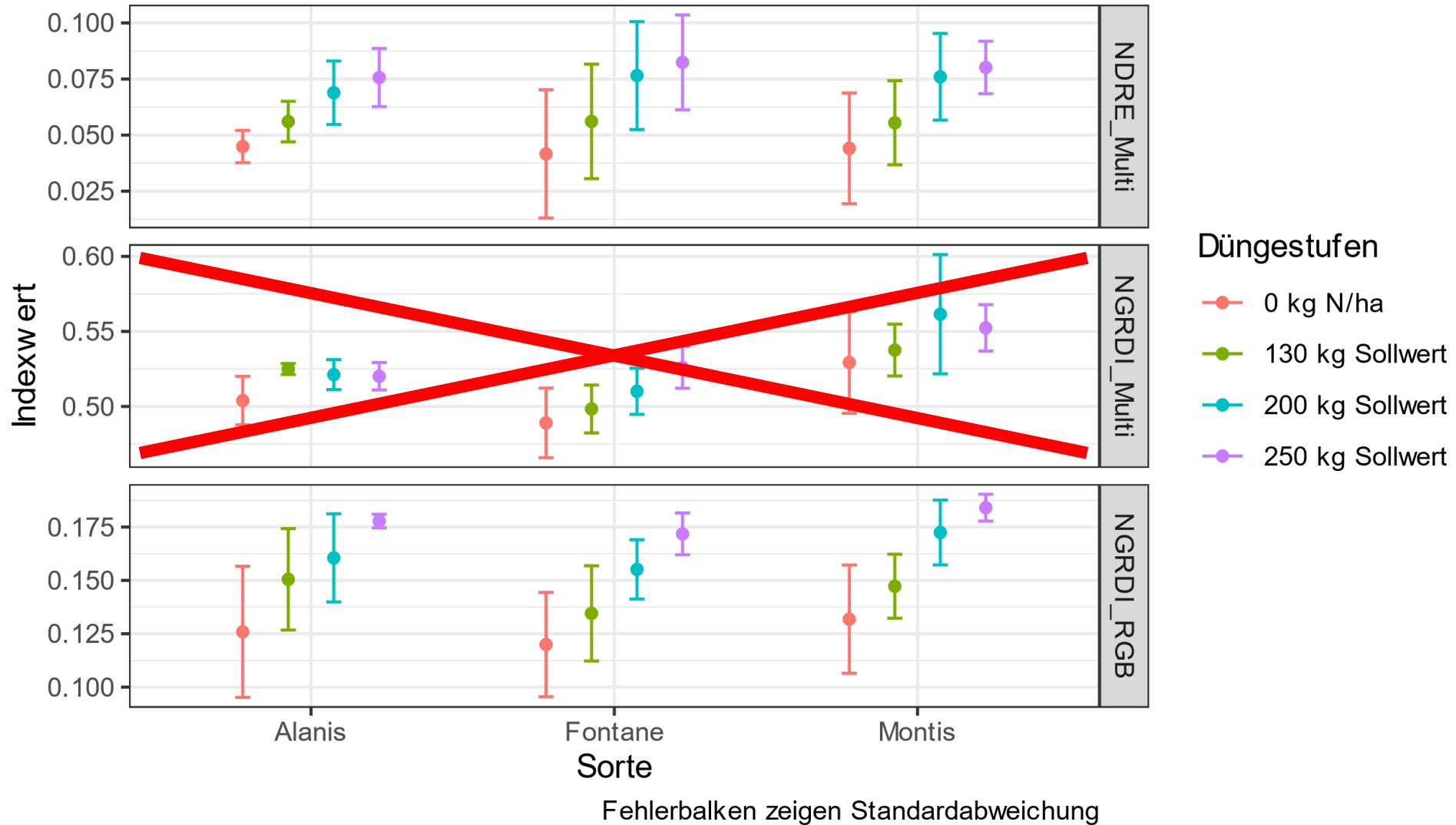
Bildbereich

- Pflanze
- ▲ Schatten

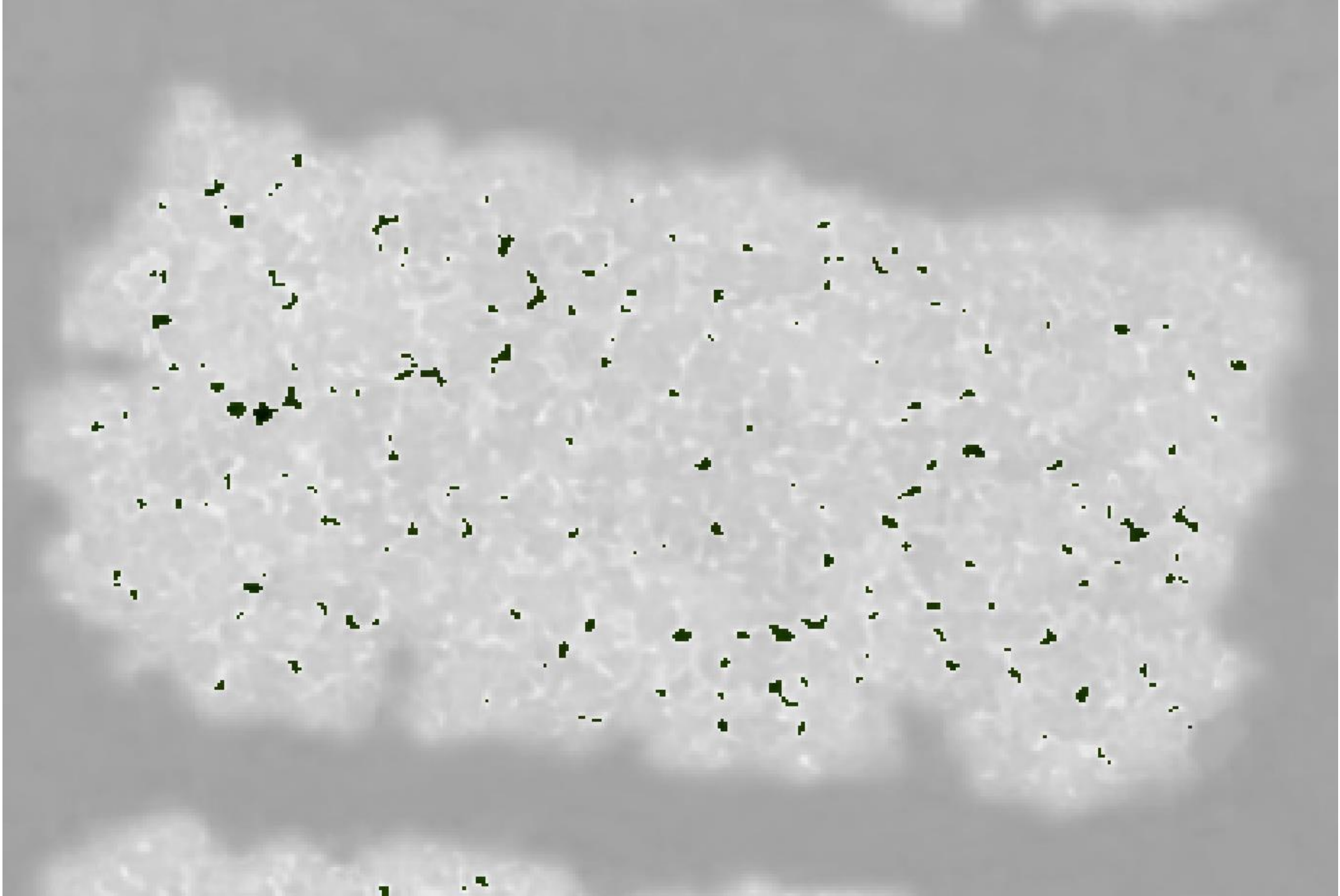
Was stimmt den nun?



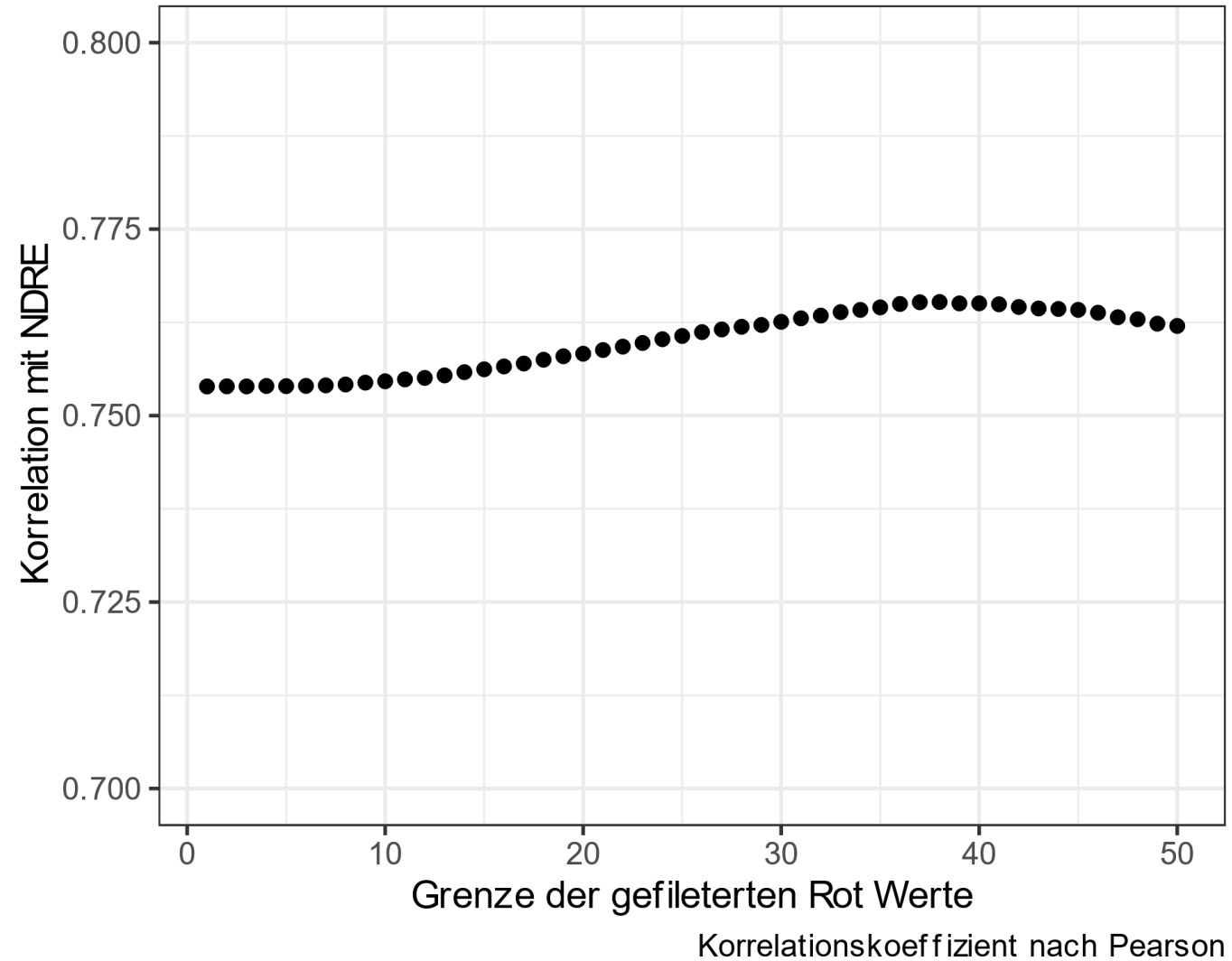
Was stimmt den nun?







Datenverlust oder Erkenntnisgewinn?



Fazit

- RGB-Vegetationsindices kostengünstig nutzbar
- Gleicher Index auf anderer „Datengrundlage“ nicht das gleiche Ergebnis
 - 32bit Float vs 8bit Int
 - Abweichender Messbereich
- NRGDI stark abhängig von Schatten
- Radiometrische Kalibration fehlt
 - Keine **absolute** Vergleichbarkeit zwischen Überflügen
- Artefakte ceteris paribus unerheblich, bei differentem Wuchs aber relevant
 - Sorte mit dem höchsten Schattenanteil „gewinnt“
- Bei geringerer Auflösung weniger auffällig, Effekt aber trotzdem existent



Vielen Dank für die Aufmerksamkeit!



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farmerspace.uni-goettingen.de



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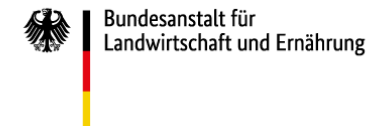
DIGITALER PFLANZENSCHUTZ

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farmerspace@uni-goettingen.de

Gefördert durch



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aufgrund eines Beschlusses
des Deutschen Bundestages