

SUPPLEMENTARY MATERIAL

An active-optical reflectance sensor in-field testing for the prediction of winter wheat harvest metrics

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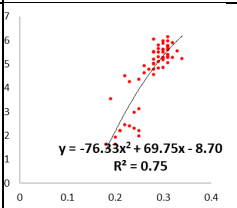
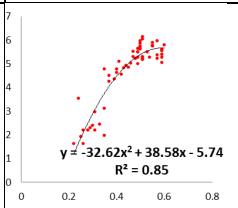
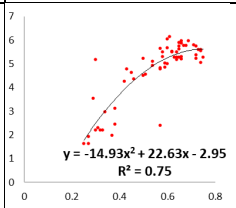
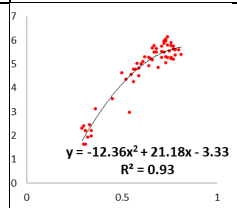
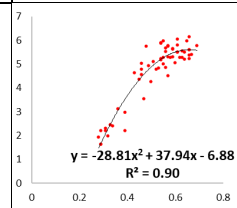
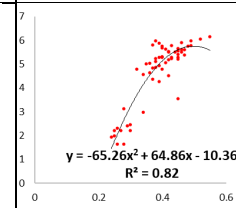
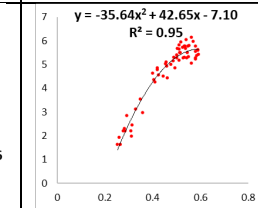
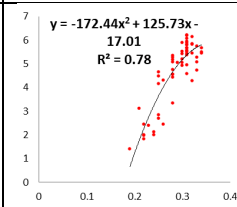
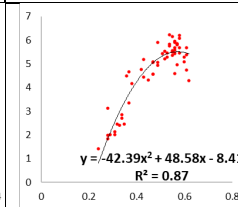
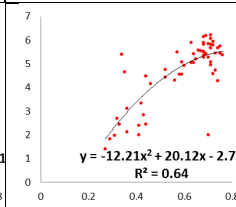
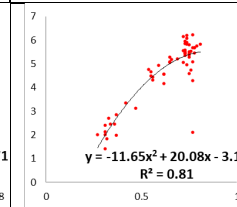
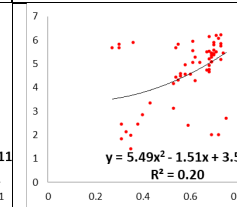
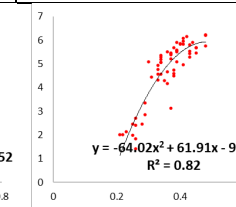
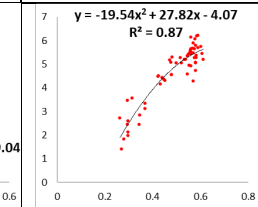
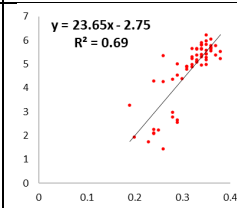
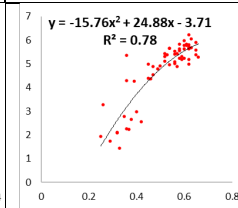
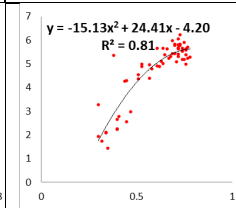
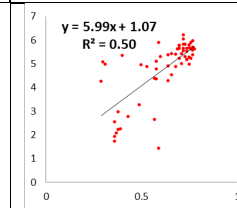
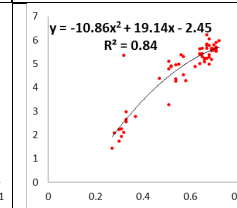
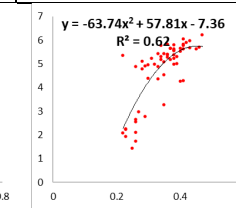
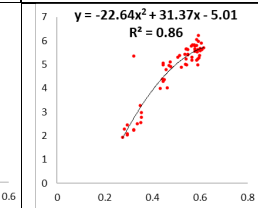
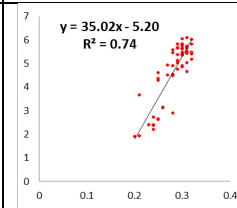
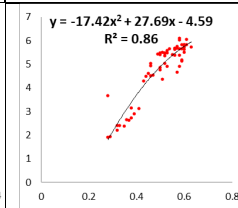
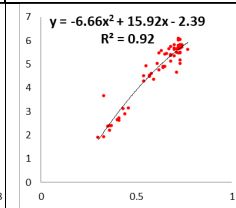
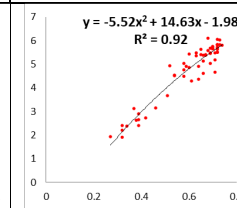
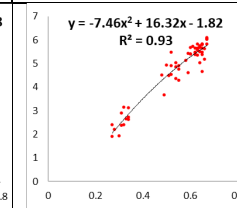
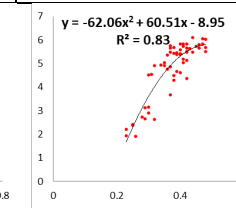
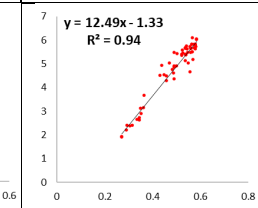
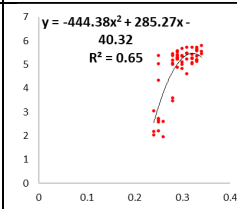
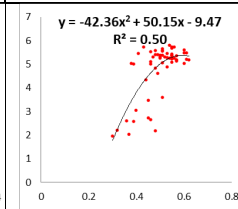
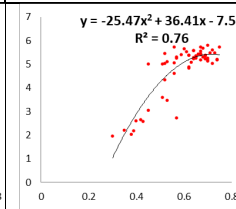
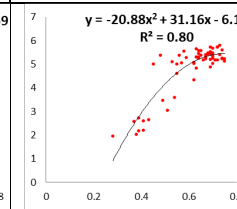
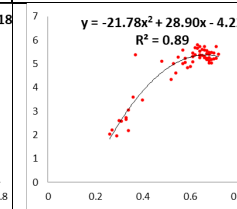
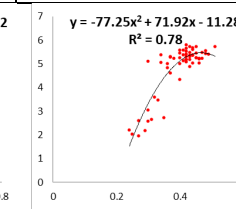
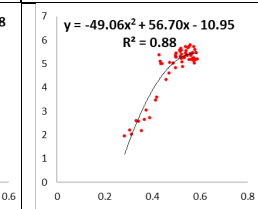
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Key words: multispectral sensors; NDVI; modelling; proximal sensors; cereals.

Conflict of interest: the authors declare no potential conflict of interest.

Table S1. Regression models for explaining grain yield using GreenSeeker NDVI data.

	21-03	06-04	18-04	09-05	20-05	06-06	\bar{X}_{R^2}
NS Igra	 $y = -76.33x^2 + 69.75x - 8.70$ $R^2 = 0.75$	 $y = -32.62x^2 + 38.58x - 5.74$ $R^2 = 0.85$	 $y = -14.93x^2 + 22.63x - 2.95$ $R^2 = 0.75$	 $y = -12.36x^2 + 21.18x - 3.33$ $R^2 = 0.93$	 $y = -28.81x^2 + 37.94x - 6.88$ $R^2 = 0.90$	 $y = -65.26x^2 + 64.86x - 10.36$ $R^2 = 0.82$	 $y = -35.64x^2 + 42.65x - 7.10$ $R^2 = 0.95$
NS Rajna	 $y = -172.44x^2 + 125.73x - 17.01$ $R^2 = 0.78$	 $y = -42.39x^2 + 48.58x - 8.41$ $R^2 = 0.87$	 $y = -12.21x^2 + 20.12x - 2.71$ $R^2 = 0.64$	 $y = -11.65x^2 + 20.08x - 3.11$ $R^2 = 0.81$	 $y = 5.49x^2 - 1.51x + 3.52$ $R^2 = 0.20$	 $y = -64.02x^2 + 61.91x - 9.04$ $R^2 = 0.82$	 $y = -19.54x^2 + 27.82x - 4.07$ $R^2 = 0.87$
NS Futura	 $y = 23.65x - 2.75$ $R^2 = 0.69$	 $y = -15.76x^2 + 24.88x - 3.71$ $R^2 = 0.78$	 $y = -15.13x^2 + 24.41x - 4.20$ $R^2 = 0.81$	 $y = 5.99x + 1.07$ $R^2 = 0.50$	 $y = -10.86x^2 + 19.14x - 2.45$ $R^2 = 0.84$	 $y = -63.74x^2 + 57.81x - 7.36$ $R^2 = 0.62$	 $y = -22.64x^2 + 31.37x - 5.01$ $R^2 = 0.86$
NS Epoha	 $y = 35.02x - 5.20$ $R^2 = 0.74$	 $y = -17.42x^2 + 27.69x - 4.59$ $R^2 = 0.86$	 $y = -6.66x^2 + 15.92x - 2.39$ $R^2 = 0.92$	 $y = -5.52x^2 + 14.63x - 1.98$ $R^2 = 0.92$	 $y = -7.46x^2 + 16.32x - 1.82$ $R^2 = 0.93$	 $y = -62.06x^2 + 60.51x - 8.95$ $R^2 = 0.83$	 $y = 12.49x - 1.33$ $R^2 = 0.94$
NS Obala	 $y = -444.38x^2 + 285.27x - 40.32$ $R^2 = 0.65$	 $y = -42.36x^2 + 50.15x - 9.47$ $R^2 = 0.50$	 $y = -25.47x^2 + 36.41x - 7.59$ $R^2 = 0.76$	 $y = -20.88x^2 + 31.16x - 6.18$ $R^2 = 0.80$	 $y = -21.78x^2 + 28.90x - 4.22$ $R^2 = 0.89$	 $y = -77.25x^2 + 71.92x - 11.28$ $R^2 = 0.78$	 $y = -49.06x^2 + 56.70x - 10.95$ $R^2 = 0.88$

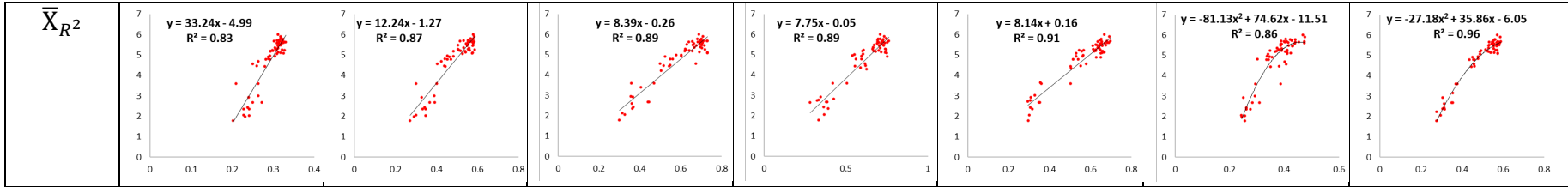
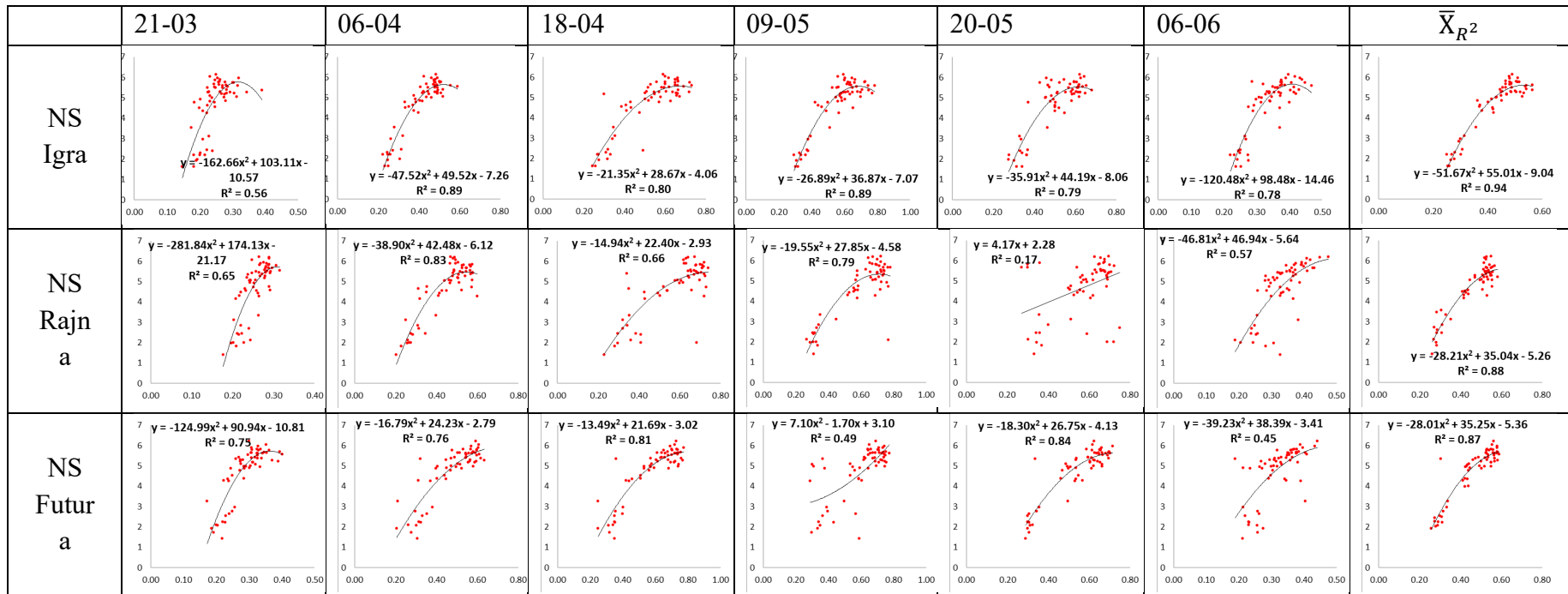


Table S2. Regression models for explaining grain yield using Plant-O-Meter NDVI data.



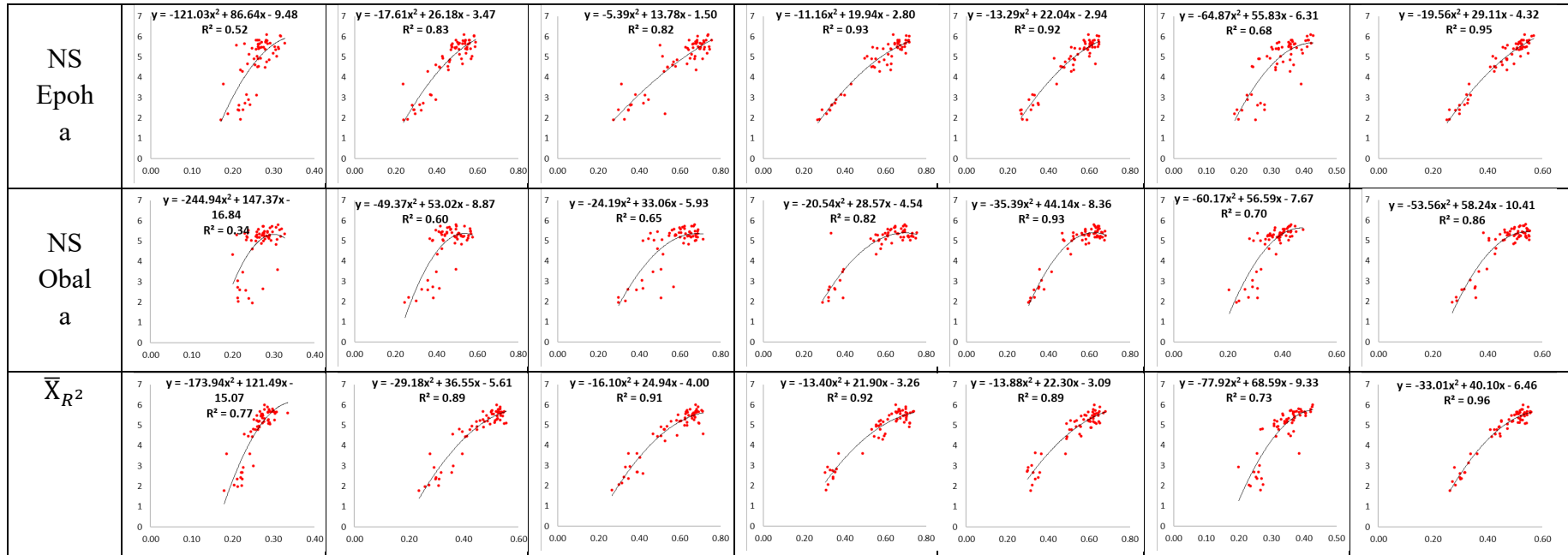


Table S3. Regression models for explaining plant height using GreenSeeker NDVI data.

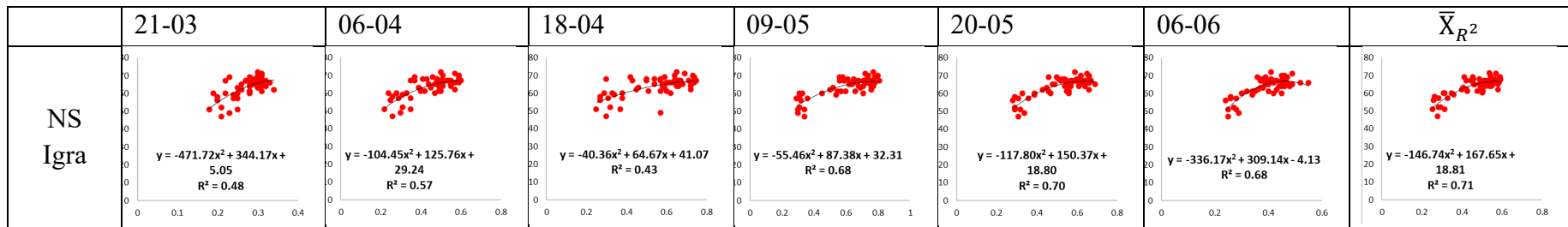
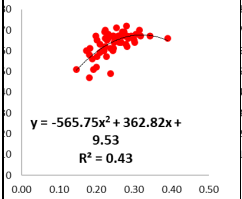
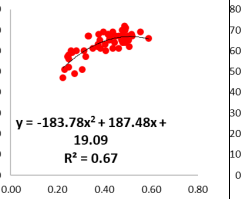
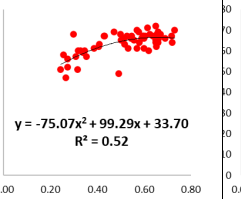
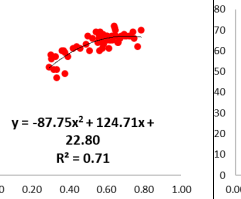
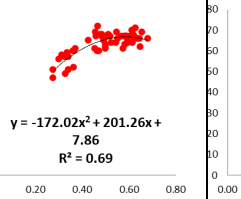
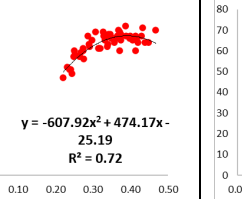
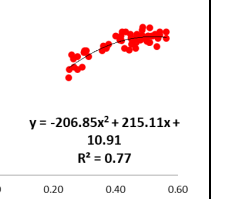
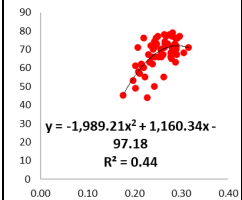
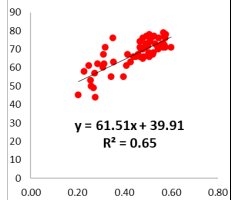
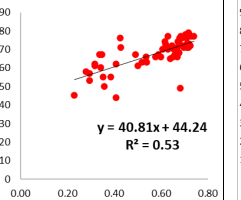
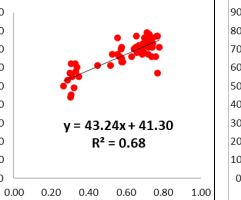
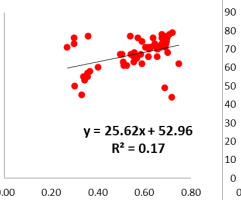
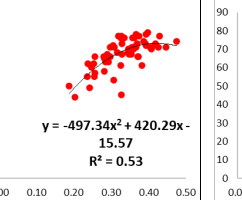
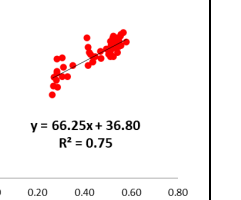
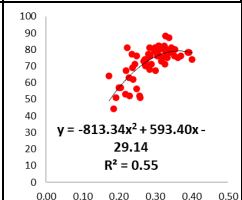
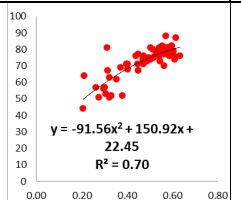
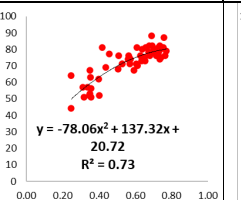
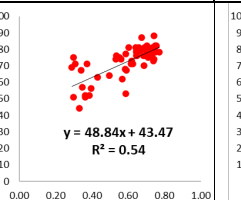
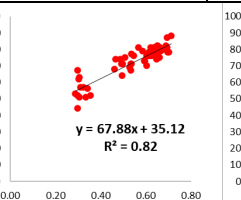
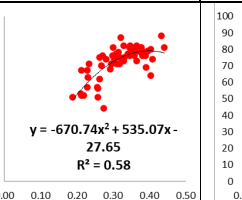
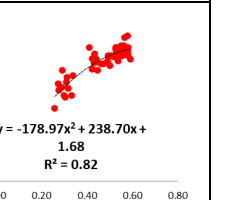
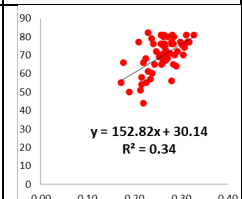
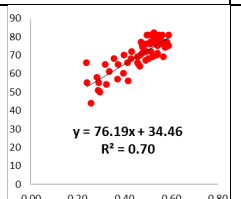
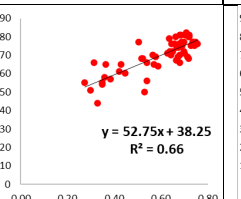
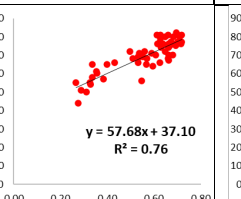
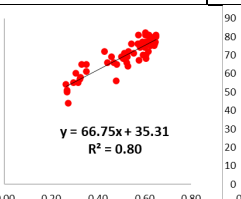
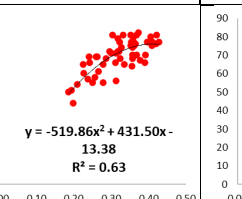
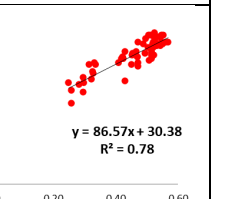
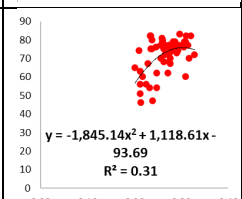
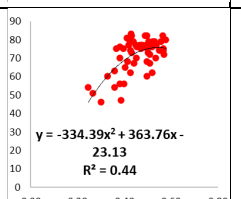
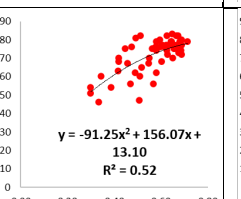
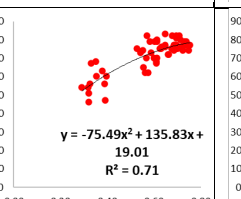
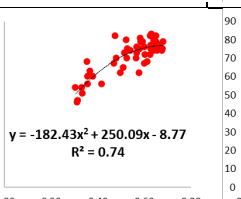
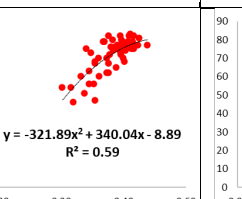
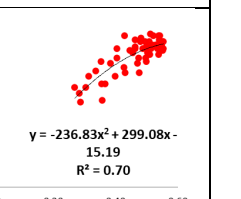




Table S4. Regression models for explaining plant height using Plant-O-Meter NDVI data.

	21-03	06-04	18-04	09-05	20-05	06-06	\bar{X}_{R^2}
NS Igra	 <p> $y = -565.75x^2 + 362.82x + 9.53$ $R^2 = 0.43$ </p>	 <p> $y = -183.78x^2 + 187.48x + 19.09$ $R^2 = 0.67$ </p>	 <p> $y = -75.07x^2 + 99.29x + 33.70$ $R^2 = 0.52$ </p>	 <p> $y = -87.75x^2 + 124.71x + 22.80$ $R^2 = 0.71$ </p>	 <p> $y = -172.02x^2 + 201.26x + 7.86$ $R^2 = 0.69$ </p>	 <p> $y = -607.92x^2 + 474.17x - 25.19$ $R^2 = 0.72$ </p>	 <p> $y = -206.85x^2 + 215.11x + 10.91$ $R^2 = 0.77$ </p>
NS Rajna	 <p> $y = -1,989.21x^2 + 1,160.34x - 97.18$ $R^2 = 0.44$ </p>	 <p> $y = 61.51x + 39.91$ $R^2 = 0.65$ </p>	 <p> $y = 40.81x + 44.24$ $R^2 = 0.53$ </p>	 <p> $y = 43.24x + 41.30$ $R^2 = 0.68$ </p>	 <p> $y = 25.62x + 52.96$ $R^2 = 0.17$ </p>	 <p> $y = -497.34x^2 + 420.29x - 15.57$ $R^2 = 0.53$ </p>	 <p> $y = 66.25x + 36.80$ $R^2 = 0.75$ </p>
NS Futura	 <p> $y = -813.34x^2 + 593.40x - 29.14$ $R^2 = 0.55$ </p>	 <p> $y = -91.56x^2 + 150.92x + 22.45$ $R^2 = 0.70$ </p>	 <p> $y = -78.06x^2 + 137.32x + 20.72$ $R^2 = 0.73$ </p>	 <p> $y = 48.84x + 43.47$ $R^2 = 0.54$ </p>	 <p> $y = 67.88x + 35.12$ $R^2 = 0.82$ </p>	 <p> $y = -670.74x^2 + 535.07x - 27.65$ $R^2 = 0.58$ </p>	 <p> $y = -178.97x^2 + 238.70x + 1.68$ $R^2 = 0.82$ </p>
NS Epoha	 <p> $y = 152.82x + 30.14$ $R^2 = 0.34$ </p>	 <p> $y = 76.19x + 34.46$ $R^2 = 0.70$ </p>	 <p> $y = 52.75x + 38.25$ $R^2 = 0.66$ </p>	 <p> $y = 57.68x + 37.10$ $R^2 = 0.76$ </p>	 <p> $y = 66.75x + 35.31$ $R^2 = 0.80$ </p>	 <p> $y = -519.86x^2 + 431.50x - 13.38$ $R^2 = 0.63$ </p>	 <p> $y = 86.57x + 30.38$ $R^2 = 0.78$ </p>
NS Obala	 <p> $y = -1,845.14x^2 + 1,118.61x - 93.69$ $R^2 = 0.31$ </p>	 <p> $y = -334.39x^2 + 363.76x - 23.13$ $R^2 = 0.44$ </p>	 <p> $y = -91.25x^2 + 156.07x + 13.10$ $R^2 = 0.52$ </p>	 <p> $y = -75.49x^2 + 135.83x + 19.01$ $R^2 = 0.71$ </p>	 <p> $y = -182.43x^2 + 250.09x - 8.77$ $R^2 = 0.74$ </p>	 <p> $y = -321.89x^2 + 340.04x - 8.89$ $R^2 = 0.59$ </p>	 <p> $y = -236.83x^2 + 299.08x - 15.19$ $R^2 = 0.70$ </p>

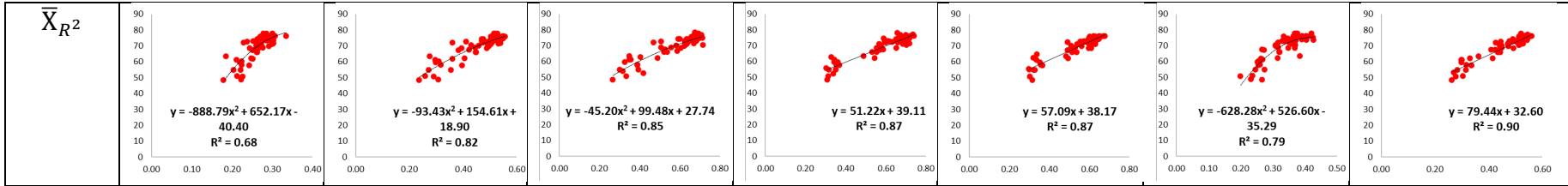
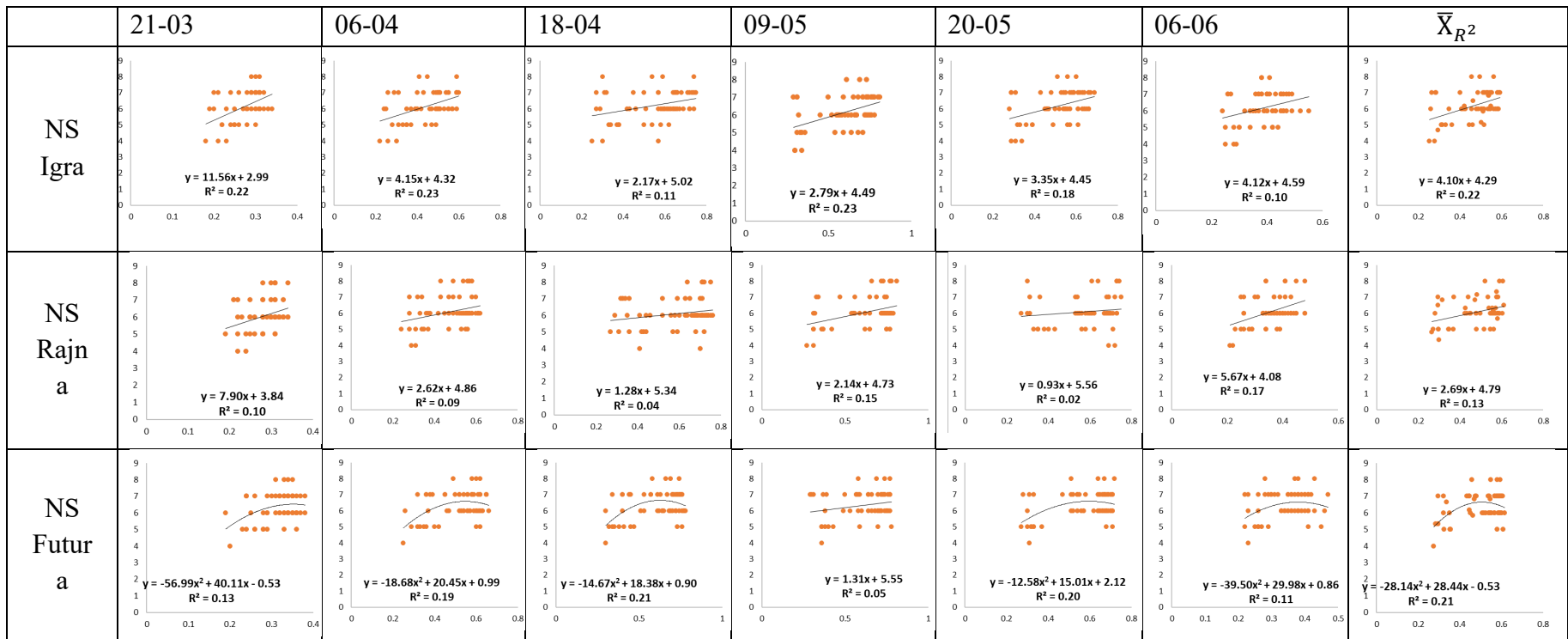


Table S5. Regression models for explaining spike length using GreenSeeker NDVI data.



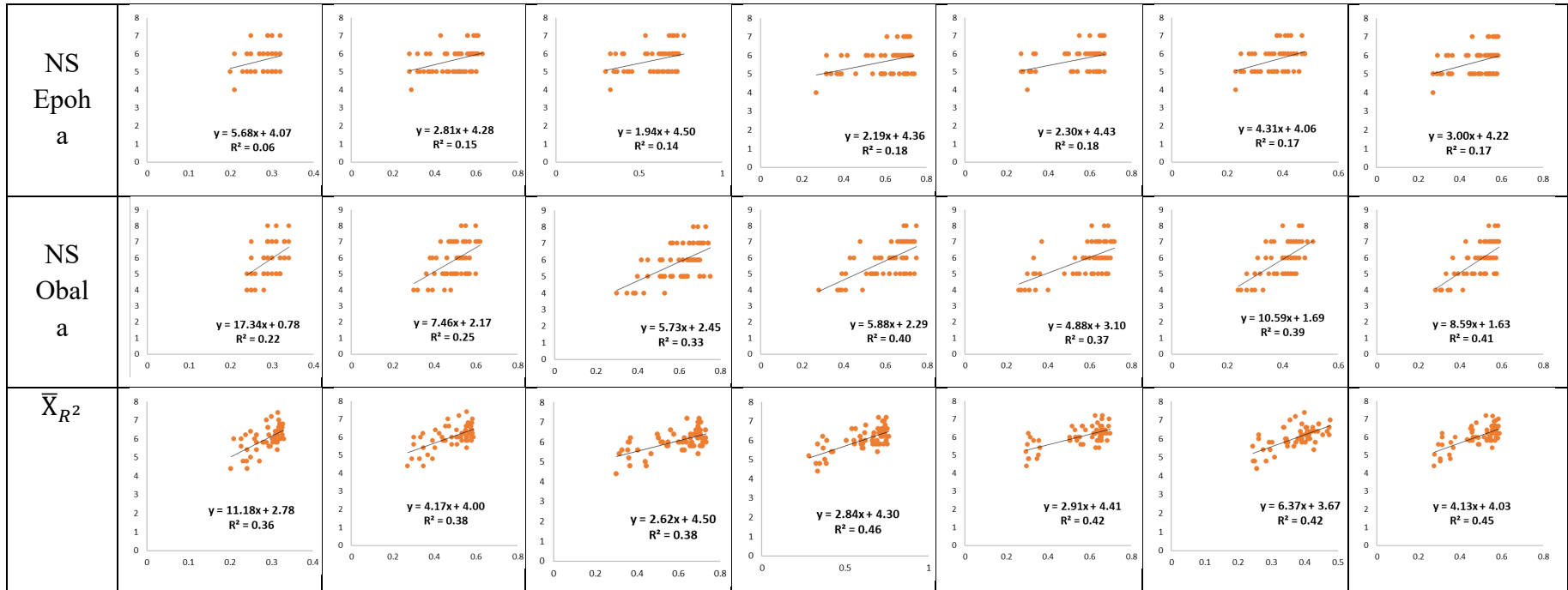


Table S6. Regression models for explaining spike length using Plant-O-Meter NDVI data.

