From Peng et al 2011:

The results of algorithm calibration for estimating daytime gross primary production in 16 irrigated and rainfed maize sites in 2001 through 2008. Best fit functions determination coefficients (R2) and root mean square errors (RMSE) of GPP estimation are given for six vegetation indices.

VIs	GPP=f (VI×PARin)	R2	RMSE (gC/m2/d)
NDVI	GPP=2E−02 x−2.38	0.82	3.36
WDRVI	GPP=5E−08 x^2+0.0013 x+10.23	0.88	2.76
EVI2	GPP=−1E−07 x^2+0.0039 x−3.86	0.88	2.75
SR	GPP=28.8*(1−$e^{-6.78e-6x}$)	0.92	2.32
CIgreen	GPP=−154+14.7 ln(x+27900.61)	0.92	2.24
CIred edge	GPP=−121+12.42 ln(x+16082.91)	0.93	2.12

From Peng and Gitelson 2011:

The results of calibration of the algorithms for estimating daytime GPP in 16 irrigated and rainfed maize sites from 2001 through 2008: GPP = f(x), x = VI× PARin. Best fit functions and determination coefficients (R2) are given for twelve vegetation indices.

VI	Best fit function	R2	RMSE gC/m2/d
MCARI	GPP =−2.91E−10 * x^2 + 1.7 E−4 * x−0.35	0.71	4.92
NDVI	GPP = 1.94E−3 * x−2.59	0.79	3.80
VARI	GPP =−1.03E−7 * x^2 + 4.1E−3 * x + 10.83	0.80	3.57
MTVI1	GPP =−8.47E−12 * x^2 + 3.5E−5 * x + 1.12	0.84	3.60
TVI	GPP =−6.35E−15 * x^2 + 9.2E−7 * x + 0.23	0.84	3.58
EVI2	GPP =−9.26E−8 * x^2 + 0.0035 * x−3.08	0.88	3.55
MTVI2	GPP =−6.75E−8 * x^2 + 2.92 E−3 * x + 1.66	0.87	3.11
WDRVI	GPP =−1.93E−8 * x^2 + 1.70E−3 * x−0.76	0.87	2.92
SR	GPP = 28.8 * (1−$e^{-6.78e-6*x}$)	0.92	2.62
MTCI	GPP =−1.16E−9 * x^2 + 3.85E−4 * x−1.60	0.89	2.65
CIgreen	GPP =−154 + 14.7 * ln (x + 27900.61)	0.92	2.75
CIred edge	GPP =−121 + 12.42 * ln (x + 16082.91)	0.93	2.56

From Peng and Gitelson 2012:

Established relationships “daytime GPP vs. VI×PARin” in 8 irrigated and rainfed soybean sites in 2002, 2004, 2006 and 2008: GPP=f(x), x=VI×PARin. Best fit functions, determination coefficients (R2) and root mean square errors (RMSE) are given for twelve vegetation indices. GPP ranged from 0 to 19 gC/m2/d. All algorithms and RMSE were obtained using a k-fold cross validation procedure with k=15.

VI	Best fit function	R2	RMSE(gC/m2/d)
CIred edge	GPP= 4.80ln(x)−37.93	0.90	1.56
CIgreen	GPP= 5.13ln(x)−46.92	0.88	1.72
Red edge NDVI	GPP=−1.19E-7x^2+3.00E-3x−2.70	0.87	1.76
WDRVI	GPP=−2.43E-8x^2+1.30E-3x−0.37	0.87	1.78
SR	GPP= 4.33ln(x)−40.20	0.85	1.91
MTVI2	GPP=−5.70E-8x^2+1.90E-3x+0.90	0.84	1.95
EVI2	GPP=−8.85E-8x^2+2.50E-3x−1.53	0.84	1.95
NDVI	GPP=−3.26E-8x^2+1.70E-3x−2.17	0.83	2.02
MTCI	GPP=−2.66E-9x^2+4.17E-4x−1.33	0.82	2.04
TVI	GPP=−5.34E-15x^2+5.85E-7x−0.33	0.81	2.14
MTVI1	GPP=−7.34E-12x^2+2.14E-5x+0.51	0.81	2.17
VARI	GPP=−3.62E-8x^2+1.8E-3x+6.39	0.79	2.30

From Peng and Gitelson 2012:

The algorithms based on indices using MERIS red edge band for estimating daytime GPP in 24 maize and soybean fields from 2001 through 2008: GPP=f(x), x=VI×PARin. Bestfit functions, determination coefficients (R2), root mean square errors (RMSE) and coefficients of variation were obtained using a k-fold cross validation procedure with k=15.

VI	Best fit function	R2	RMSE(gC/m2/d)	CV (%)
Red edge NDVI	GPP=−1.68E-8x2+2.1E-3x−1.04	0.81	3.17	25.5
CIred edge	GPP=−1.63E-9x2+4.1E-4x+1.55	0.85	2.74	22.1
MTCI	GPP=−7.13E-10x2+3.31E-4x−0.75	0.85	2.72	22.0

From Gitelson et al 2012:

The algorithms for daytime GPP estimating in irrigated and rainfed maize sites at Mead, Nebraska during 2001–2008 (120 samples), with determination coefficients (R2), standard errors (SE) and coefficients of variation (CV) presented.

VI	Best fit function	R2	RMSE(gC/m2/d)	CV (%)
Green WDRVI	GPP=2.63x−8.59	0.95	1.90	12.1
EVI2	GPP=3.54x−4.62	0.95	1.92	12.3
Green NDVI	GPP=4.00x−15.4	0.94	2.20	14.0
NDVI	GPP=3.11x−9.22	0.93	2.22	14.2
CIgreen	GPP=3.57x+9.29	0.91	2.67	17.0
SR	GPP=0.114x+3.02	0.84	3.49	22.2

The algorithms for daytime GPP estimating in irrigated and rainfed soybean sites at Mead, Nebraska in 2002, 2004, 2006 and 2008 (54 samples), with determination coefficients (R2), standard errors (SE) and coefficients of variation (CV) presented.

VI	Best fit function	R2	RMSE(gC/m2/d)	CV (%)
Green NDVI	GPP=2.86x−11.9	0.92	1.40	14.9
Green WDRVI	GPP=1.66x−4.98	0.90	1.54	16.3
NDVI	GPP=2.07 x−6.19	0.89	1.65	17.4
EVI2	GPP=2.15x−3.06	0.87	1.79	18.9
CIgreen	GPP=0.106x+2.63	0.76	2.42	25.6
SR	GPP=0.0515x+3.91	0.67	2.79	29.5

Determination coefficients (R2), standard errors (SE) and coefficients of variation (CV) for the relationship GPP vs. VI×PARpotential with VI retrieved from Landsat atmospherically corrected and raw (uncorrected) images taken over maize sites in Nebraska from 2001 through 2008.

	Surface reflectance			TOA reflectance		
VI	R2	RMSE (gC/m2/d)	CV (%)	R2	RMSE (gC/m2/d)	CV (%)
Green WDRVI	0.95	1.90	12.1	0.93	2.23	14.2
EVI2	0.95	1.92	12.3	0.95	2.03	13.0
Green NDVI	0.94	2.20	14.0	0.93	2.36	15.0
NDVI	0.93	2.22	14.2	0.93	2.24	14.3
CIgreen	0.91	2.67	17.0	0.81	2.62	16.7
SR	0.84	3.49	22.2	0.88	2.95	18.8

Determination coefficients (R2), standard errors (SE) and coefficients of variation (CV) for the relationship GPP vs. VI×PARpotential with VI retrieved from Landsat atmospherically corrected and raw (uncorrected) images taken over soybean sites in Nebraska in 2002, 2004, 2006 and 2008.

	Surface reflectance			TOA reflectance		
VI	R2	RMSE (gC/m2/d)	CV (%)	R2	RMSE (gC/m2/d)	CV (%)
Green NDVI	0.92	1.40	14.9	0.78	2.21	23.5
Green WDRVI	0.90	1.54	16.3	0.77	2.33	24.7
NDVI	0.89	1.65	17.4	0.84	1.96	20.7
EVI2	0.87	1.79	18.9	0.77	2.33	24.7
CIgreen	0.76	2.42	25.6	0.70	2.69	28.5
SR	0.67	2.79	29.5	0.69	2.74	29.0

Referenced in this file: **Table_of_Algorithms.pdf**

Gitelson , A.A., Y. Peng, J.G. Masek, D.C. Rundquist, S. Verma, A. Suyker, J.M. Baker, J.L. Hatfield and T. Meyers. 2012. Remote estimation of crop gross primary production with Landsat data, Remote Sensing of Environment, 121: 404–414. doi: 10.1016/j.rse.2012.02.017

Peng, Y., & Gitelson, A.A., 2012. Remote estimation of gross primary productivity in soybean and maize based on total crop chlorophyll content, Remote Sensing of Environment, 117: 440-448. doi: 10.1016/j.rse.2011.10.021

Peng, Y., A.A., Gitelson. 2011. Application of Chlorophyll-related Vegetation Indices for Remote Estimation of Maize Productivity, Agricultural and Forest Meteorology, 151: 1267-1276, doi: 10.1016/j.agrformet.2011.05.005

Peng, Y., Gitelson, A.A., Keydan, G.P., Rundquist, D.C., and W.J. Moses. 2011. Remote estimation of gross primary production in maize and support for a new paradigm based on total crop chlorophyll content, Remote Sensing of Environment, doi: 10.1016/j.rse.2010.12.001