

Potential and water-limited corn and soy production, compared to the 2022 Agricultural Census

Updated for Aug. 20, 2025

Corn and soy production in some PA counties

Watersheds

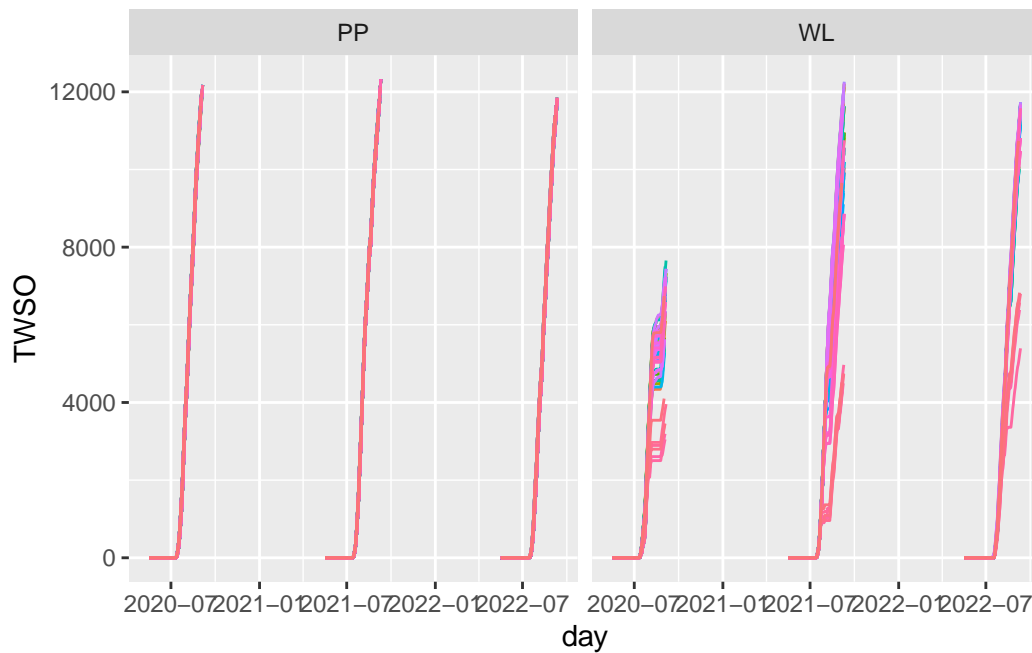
name	huc12	county
North Branch Two Lick Creek-Two Lick Creek	050100070802	Indiana
Hendricks Creek	050100071003	Westmoreland
Boyd Run-Deer Creek	050100050903	Clarion
Lake Stonycreek-Rhoads Creek	050100070301	Somerset
Buffalo Creek	050200060703	Somerset
South Glade Creek-Casselman River	050200060706	Somerset
High Point Lake-Casselman River	050200060709	Somerset
Upper Marsh Creek	020700090202	Adams
Blue Eye Run-Brokenstraw Creek	050100011106	Warren
Toby Creek	050100050703	Clarion
Little Trough Creek	020503030701	Huntingdon
Schwaben Creek	020503010502	Northumberland
Lower Cowanshannock Creek	050100060802	Armstrong
Headwaters Crooked Creek	050100061001	Indiana
Armstrong Creek	020503011004	Dauphin
Wooden Bridge Creek	020503040202	Fulton

Example yield plots: North Branch Two Lick Creek-Two Lick Creek

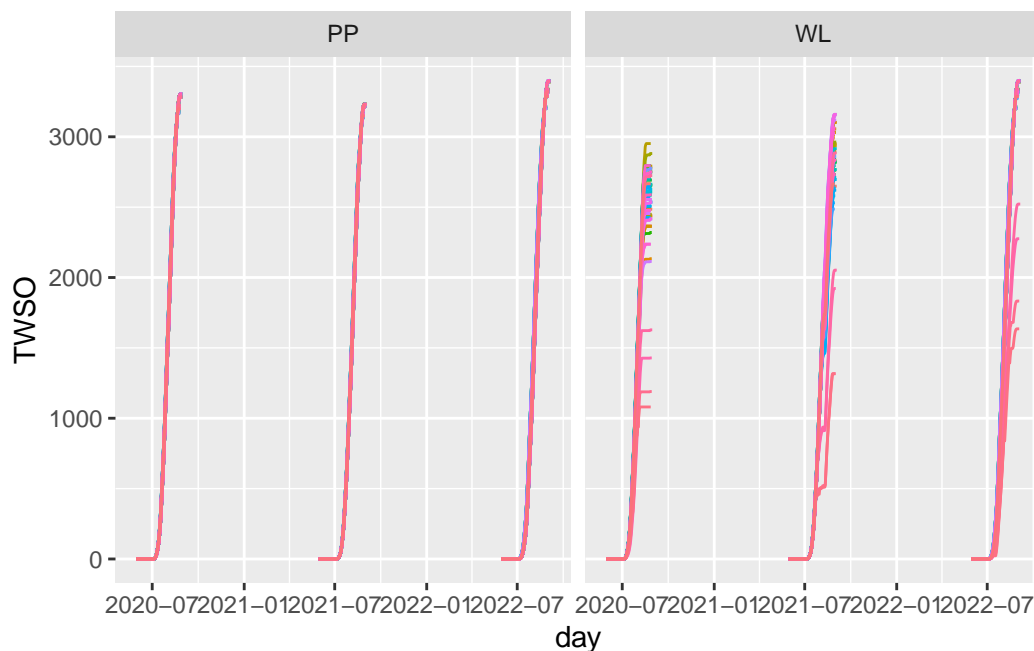
These curves show yield (TWSO) development for unique combinations of soil map units (mukey) and gridMET cells that had cultivation in them. TWSO is [total weight storage organs](#) and is in kg/ha.

TWSO is modeled using the water limited (WL) and potential production (PP) models of WOFOST.

Corn



Soy



Calculated harvest for each watershed

The ‘total.area’ value in the following two tables are the number of cultivated pixels according to the crop sequence boundary. Pixels are $30 \times 30 \text{m} = 900 \text{ sqm}$. The ‘wt.TWSO’ value is a weighted average of TWSO at harvest time across the cultivated pixels in the watershed. The weighting is by the number of pixels for each modeled yield value (i.e., the curves shown in the last section).

I used conversion factors [here](#) to convert from kg to bushels for corn and soy. These values were $1 \text{ kg corn} = 0.039368 \text{ bushel}$ and $1 \text{ kg soy} = 0.0367437 \text{ bushel}$. The conversion from pixel to acre was $1 \text{ ha} = 2.47105 \text{ acre}$.

Corn harvest

huc12	total.area	wt.TWSO.WL	wt.TWSO.PP	bushel.acre.WL	bushel.acre.PP
020503010502	16827	2928.89	10313.56	46.66	164.31
020503011004	12994	1360.63	9991.45	21.68	159.18
020503030701	2133	5661.14	10376.56	90.19	165.32
020503040202	6692	6156.58	10349.41	98.08	164.88
020700090202	6504	6027.94	9807.50	96.04	156.25
050100011106	1993	11615.27	12050.17	185.05	191.98
050100050703	2881	8682.96	12018.50	138.33	191.48
050100050903	520	7010.10	11595.98	111.68	184.74

huc12	total.area	wt.TWSO.WL	wt.TWSO.PP	bushel.acre.WL	bushel.acre.PP
050100060802	3552	10262.24	11516.46	163.49	183.48
050100061001	1649	9998.98	11375.65	159.30	181.23
050100070301	1574	12220.66	12782.37	194.70	203.64
050100070802	2838	10922.54	11632.70	174.01	185.33
050100071003	2587	11074.54	11317.10	176.44	180.30
050200060703	7553	10346.48	12236.84	164.84	194.95
050200060706	10198	11335.62	11484.09	180.60	182.96
050200060709	1288	10980.70	11211.29	174.94	178.61

Soybean harvest

huc12	total.area	wt.TWSO.WL	wt.TWSO.PP	bushel.acre.WL	bushel.acre.PP
020503010502	15789	1208.29	2961.74	17.97	44.04
020503011004	12583	1258.02	2826.42	18.71	42.03
020503030701	755	2141.34	2954.25	31.84	43.93
020503040202	3175	2462.97	2961.30	36.62	44.03
020700090202	5449	2054.13	2755.27	30.54	40.97
050100011106	601	3434.63	3514.76	51.07	52.26
050100050703	2027	3223.29	3478.95	47.93	51.73
050100050903	238	2467.47	3362.46	36.69	50.00
050100060802	1640	3265.39	3335.09	48.56	49.59
050100061001	1303	3038.11	3262.23	45.18	48.51
050100070301	233	3376.30	3376.30	50.20	50.20
050100070802	1958	3332.40	3353.37	49.55	49.86
050100071003	1841	3228.88	3228.88	48.01	48.01
050200060703	3062	3241.21	3272.03	48.20	48.65
050200060706	8039	3169.36	3172.42	47.13	47.17
050200060709	553	3148.45	3148.45	46.82	46.82

Compare to census

Census data

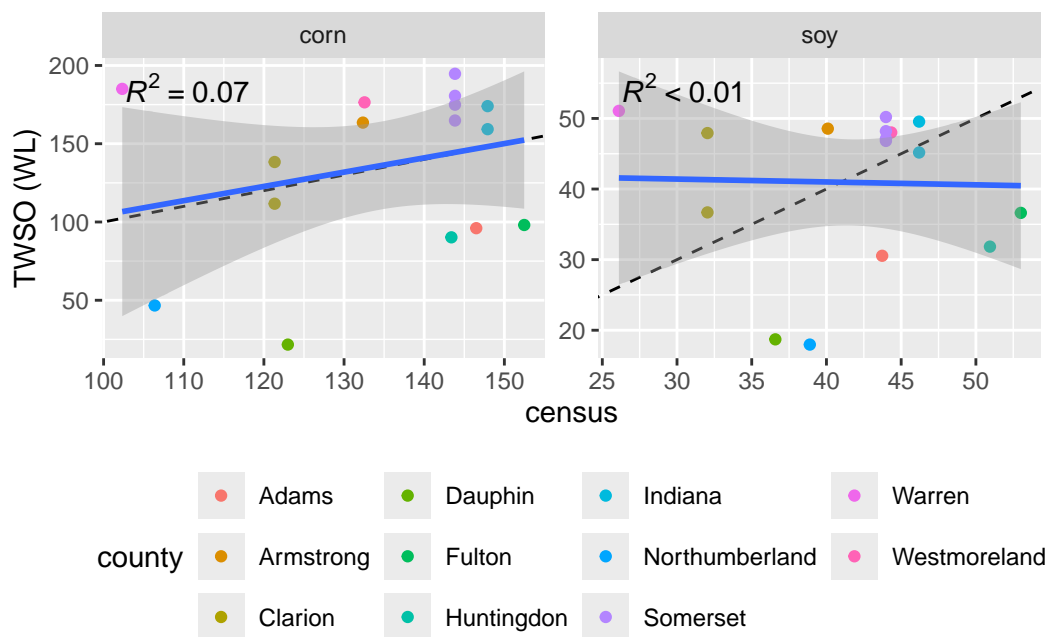
Bushels per acre for each county was calculated by dividing the harvested quantity by harvested acres in the county for 2022, from the [ag census](#).

county	corn.census	soy.census
Adams	146.49	43.73
Armstrong	132.35	40.09
Clarion	121.34	32.04
Dauphin	122.99	36.58
Fulton	152.48	53.01

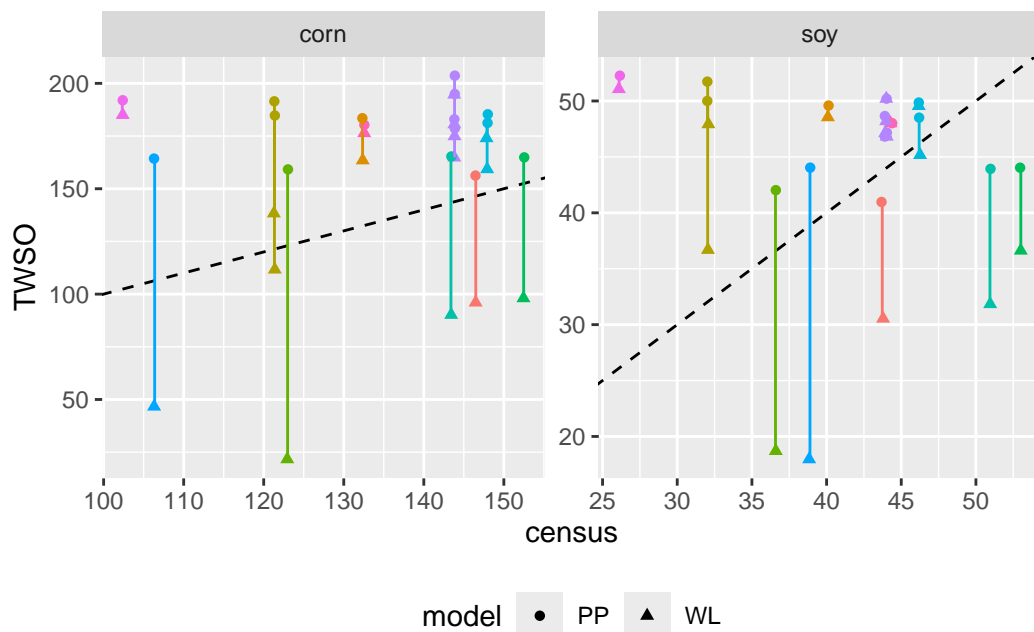
county	corn.census	soy.census
Huntingdon	143.39	50.94
Indiana	147.91	46.20
Northumberland	106.38	38.89
Somerset	143.84	43.98
Warren	102.33	26.11
Westmoreland	132.56	44.34

Comparisons to model

Comparing water limited (WL) to census yields



Comparing water limited (WL) and potential production (PP) results to census yields



name	county	corn.WL	corn.PP	soy.WL	soy.PP	corn.census	soy.census
North Branch Two Lick Creek-Two Lick Creek	Indiana	174.01	185.33	49.55	49.86	147.91	46.20
Hendricks Creek	Westmoreland	176.44	180.30	48.01	48.01	132.56	44.34
Boyd Run-Deer Creek	Clarion	111.68	184.74	36.69	50.00	121.34	32.04
Lake Stonycreek-Rhoads Creek	Somerset	194.70	203.64	50.20	50.20	143.84	43.98
Buffalo Creek	Somerset	164.84	194.95	48.20	48.65	143.84	43.98
South Glade Creek-Casselman River	Somerset	180.60	182.96	47.13	47.17	143.84	43.98
High Point Lake-Casselman River	Somerset	174.94	178.61	46.82	46.82	143.84	43.98
Upper Marsh Creek	Adams	96.04	156.25	30.54	40.97	146.49	43.73
Blue Eye Run-Brokenstraw Creek	Warren	185.05	191.98	51.07	52.26	102.33	26.11
Toby Creek	Clarion	138.33	191.48	47.93	51.73	121.34	32.04
Little Trough Creek	Huntingdon	90.19	165.32	31.84	43.93	143.39	50.94
Schwaben Creek	Northumberland	116.66	164.31	17.97	44.04	106.38	38.89
Lower Cowanshannock Creek	Armstrong	163.49	183.48	48.56	49.59	132.35	40.09
Headwaters Crooked Creek	Indiana	159.30	181.23	45.18	48.51	147.91	46.20
Armstrong Creek	Dauphin	21.68	159.18	18.71	42.03	122.99	36.58
Wooden Bridge Creek	Fulton	98.08	164.88	36.62	44.03	152.48	53.01