

# **Biofuels and the RFS**

## **Impacts of Policy Changes on Grain Utilization**

**Two Simultaneous Political Demand Episodes  
—China Soybeans and US Fuel Ethanol—  
Drive Wealth Build in Cornbelt**

**As EPA proposes 2014 waivers of RFS, can exports pick up where  
the RFS leaves off?**

***NGFA Country Elevator Conference  
St. Louis, MO***

**PRX • Marty Ruikka • December 9, 2013**

## In political shift, EPA' s 2014 NPRM proposes reductions to RVOs, using both:

- Cellulosic waiver, due to small probable production
- General waiver, due to “inadequate domestic supply”
  - Which in turn is due to lack of retail infrastructure capable of distributing greater than E10 blends of gasoline
- Which together in 2014
  - Reduces Total Renewable Fuel from 18.150 bil gals to 15.210
  - Reduces Advanced Biofuel from 3.750 bil gals to 2.200
  - Reduces Cellulosic Biofuel from 1.750 bil gals to 0.017
  - Leaves Biomass-based Biodiesel at 1.280 bil gals
  - Reduces Conventional (corn/milo) ethanol from 14.400 bil gals to 13.347
- And which thus leaves RIN values too weak
  - To force more E85/E15 retail distribution, or
  - To force new Advanced or Cellulosic technology and investment

## EPA PROPOSED RULE for RFS VOLUMES IN 2014 — CELLULOSIC vs. GENERAL WAIVERS

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Cal Year	Columns								
	a	b	c	d	e	f	g	h	
	Total Renewable Fuel	Total Advanced Biofuel	= Cellulosic Biofuel	+ Biomass-based Biodiesel	+ Other Advanced Biofuel (b - (c+d))	Conventional Biofuel (a - b)			
<b>APPLICABLE VOLUMES, BEFORE EITHER CELLULOSIC OR GENERAL WAIVER</b>									
	<i>Actual billion gallons</i>								
1	2014	18.150	3.750	1.750	1.280	na			
	<i>Ethanol equivalent billion gallons</i>				<i>x 1.5</i>				
2	2014	18.150	3.750	= 1.750	+ 1.920	+ 0.250	14.400		

Note 1. In column d, the factor 1.5 is adjustment for greater energy content per gallon of biodiesel.

### EPA USES CELLOSIC & GENERAL WAIVERS IN 2014 NPRM TO REDUCE a & b as shown, and also c:

<i>Ethanol equivalent billion gallons</i>							a - b	estimated	f + g - e
	<i>reduction</i>	<b>-2.940</b>	<b>-1.550</b>	<i>sugar imports</i>			<i>domestic</i>		<i>corn/milo</i>
	<i>reduced to</i>		<i>reduced to</i>	<i>remaining at</i>	<i>increased to</i>		<i>RVO</i>	<i>exports</i>	<i>production</i>
3	2014	15.210	2.200	= 0.017	+ 1.920	+ 0.263	13.010	0.600	13.347
	<i>reduction</i>	<b>-2.940</b>	<b>-1.240</b>	<i>sugar imports</i>			<i>domestic</i>		<i>corn/milo</i>
	<i>reduced to</i>		<i>reduced to</i>	<i>remaining at</i>	<i>increased to</i>		<i>RVO</i>	<i>exports</i>	<i>production</i>
4	2014	15.210	2.510	= 0.017	+ 1.920	+ 0.573	12.700	0.600	12.727
	<i>reduction</i>	<b>-2.940</b>	<b>-1.750</b>	<i>sugar imports</i>			<i>domestic</i>		<i>corn/milo</i>
	<i>reduced to</i>		<i>reduced to</i>	<i>remaining at</i>	<i>increased to</i>		<i>RVO</i>	<i>exports</i>	<i>production</i>
5	2014	15.210	2.000	= 0.017	+ 1.920	+ 0.063	13.210	0.600	13.747

The "primary" line is what EPA proposes. Option 1 and Option 2 are the low and high ends of reduction range for which EPA seeks comments from stakeholders.

Corn/milo production	bil gals	13.347
Milo production	mil bu	120
	gal/bu	2.70
	bil gal	0.324
Corn production	mil bu	4689
	gal/bu	2.78
	bil gal	13.023

Despite the fact that EPA figures are for calendar 2014, PRX will use them as best estimate for crop year 2013-14

### CURRENT PRX US TOTAL FUEL ETHANOL SUPPLY-DEMAND, 2008-2020, Blue Sky #34

PRX\_BS\_Assumptions, Nov-24-13

Line	Renewable Fuels Standard per EISA 2007	Unit	Calendar Year												
			2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1	All renewable fuels	mil gal	9000	11100	12950	13950	15200	16550	18150	20500	22250	24000	26000	28000	30000
2	Conventional ethanol	mil gal	9000	10500	12000	12600	13200	13800	14400	15000	15000	15000	15000	15000	15000
3	Advanced biofuels of which	mil gal		600	950	1350	2000	2750	3750	5500	7250	9000	11000	13000	15000
4	Cellulosic biofuel	mil gal			100	250	500	1000	1750	3000	4250	5500	7000	8500	10500
5	Biodiesel	mil gal		500	650	800	1000	1000	1000	1000	1000	1000	1000	1000	1000
6	Other Advanced biofuels	mil gal		100	200	300	500	750	1000	1500	2000	2500	3000	3500	3500
PRX Forecast			Crop Year												
Conventional Ethanol (Corn & Sorghum)			08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21
7	RFS est. by crop yr	mil gal	10200	11500	12400	13000	13600	14200	14800	15000	15000	15000	15000	15000	15000
8	Carry-in	mil gal	625	616	730	761	813	823	833	843	853	863	873	883	893
9	Imports (incl. Sugar Eth)	mil gal	340	52	41	328	744	200	185	170	155	140	125	110	95
10	Domestic production	mil gal	10295	12670	13811	13790	12907	13347	13595	13930	13960	13990	14020	14050	14080
11	Supply	mil gal	11259	13338	14583	14880	14465	14370	14613	14943	14968	14993	15018	15043	15068
12	Carry-out	mil gal	616	730	761	813	823	833	843	853	863	873	883	893	903
13	Disappearance	mil gal	10643	12932	13821	14066	13641	13537	13770	14090	14105	14120	14135	14150	14165
14	Exports	mil gal	104	262	827	1095	755	650	670	690	710	730	750	770	790
15	Domestic use	mil gal	10540	12670	12995	12971	12886	12887	13100	13400	13395	13390	13385	13380	13375
Advanced Ethanol															
16	Cellulosic ethanol use	mil gal			0	0	0	17	75	150	160	170	180	190	200
17	Oth Adv ethanol imports	mil gal			0	0	0	0	5	10	15	20	25	30	35
18	Dom ethanol E85/E15 equiv	mil gal			50	60	70	250	260	350	400	450	500	525	550
19	Total ethanol use	mil gal	10540	12670	12995	12971	12886	12904	13180	13560	13570	13580	13590	13600	13610
20	Total ethanol use w/o E10+	mil gal	10540	12670	12945	12911	12816	12654	12920	13210	13170	13130	13090	13075	13060
21	Total MoGas not E10+*	bil gal	137.4	137.7	137.8	134.0	133.8	133.5	131.4	130.4	129.6	128.9	128.1	127.4	126.9
22	Share with Ethanol	pct		91.0%	96.0%	96.0%	96.0%	96.0%	96.3%	96.6%	96.9%	97.2%	97.5%	97.8%	98.1%
23	Calculated Inclusion rate	pct	7.7%	10.1%	9.8%	10.0%	10.0%	9.9%	10.2%	10.5%	10.5%	10.5%	10.5%	10.5%	10.5%
Conventional corn ethanol production peaks with RFS plus exports, but total ethanol use exceeds E-10 in 2014. Imports of Sugar Ethanol meet part of the Advanced Standard and CARB LCFS, but EPA waivers needed every year!															
24	Fuel Ethanol from Corn	mil gal		12378	13580	13554	12593	13023	13261	13586	13606	13625	13644	13663	13682
25	Corn required	mil bu		4521	4942	4915	4551	4689	4758	4858	4848	4838	4828	4818	4808
26	Fuel Ethanol from Sorghum	mil gal		292	231	236	314	324	334	344	354	365	376	387	398
27	Sorghum required	mil bu		108	85	88	116	120	124	127	131	135	139	143	148
28	Corn + Sorghum req.	mil bu	3744	4629	5028	5003	4667	4809	4882	4985	4979	4973	4967	4961	4956

## UNITED STATES CORN SUPPLY-DEMAND, 2011-2020

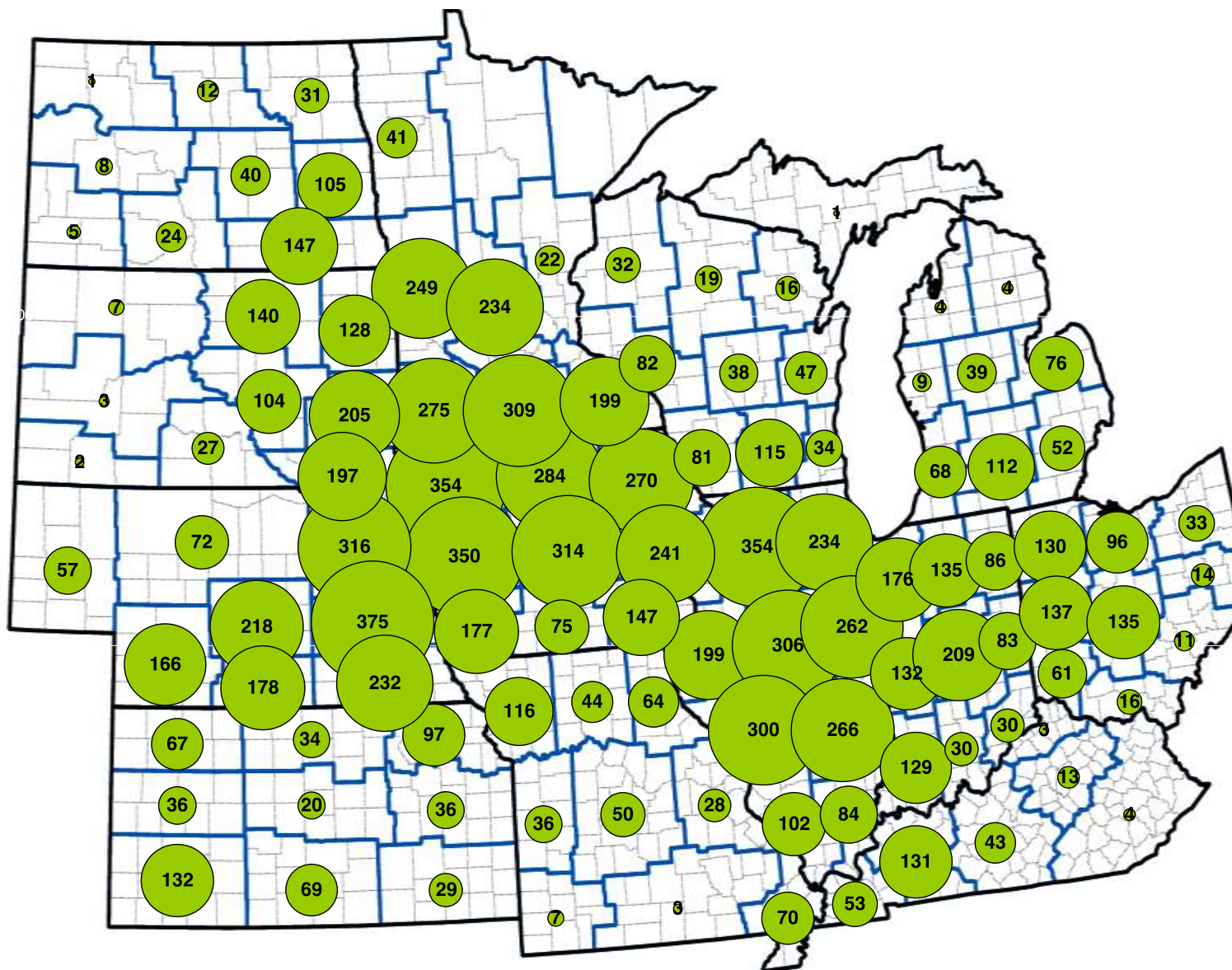
PRX\_BS1\_OverviewDeck\_Start, GTB-13-11, Nov-25-13

Item	Unit	Crop Year									
		11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21
Carry-in	<i>mil bu</i>	<b>1128</b>	<b>989</b>	<b>823</b>	<b>2202</b>	<b>2362</b>	<b>2347</b>	<b>2235</b>	<b>1601</b>	<b>1520</b>	<b>2736</b>
Area planted	<i>mil ac</i>	<b>91.9</b>	<b>97.2</b>	<b>95.3</b>	<b>90.0</b>	<b>90.0</b>	<b>90.0</b>	<b>90.0</b>	<b>90.0</b>	<b>90.0</b>	<b>90.0</b>
Area harvested	<i>mil ac</i>	<b>84.0</b>	<b>87.4</b>	<b>87.2</b>	<b>82.3</b>	<b>82.3</b>	<b>82.3</b>	<b>82.3</b>	<b>82.3</b>	<b>82.3</b>	<b>82.3</b>
Yield	<i>bu/ac</i>	<b>147.2</b>	<b>123.4</b>	<b>160.4</b>	<b>161.4</b>	<b>164.3</b>	<b>165.7</b>	<b>155.7</b>	<b>170.0</b>	<b>190.3</b>	<b>177.5</b>
Production	<i>mil bu</i>	<b>12360</b>	<b>10780</b>	<b>13989</b>	<b>13294</b>	<b>13525</b>	<b>13647</b>	<b>12818</b>	<b>13998</b>	<b>15668</b>	<b>14613</b>
Imports	<i>mil bu</i>	<b>29</b>	<b>162</b>	<b>25</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>
Supply	<i>mil bu</i>	<b>13516</b>	<b>11931</b>	<b>14836</b>	<b>15506</b>	<b>15897</b>	<b>16004</b>	<b>15063</b>	<b>15609</b>	<b>17199</b>	<b>17359</b>
Carry-out	<i>mil bu</i>	<b>989</b>	<b>823</b>	<b>2202</b>	<b>2362</b>	<b>2347</b>	<b>2235</b>	<b>1601</b>	<b>1520</b>	<b>2736</b>	<b>2994</b>
Disappearance (Use)	<i>mil bu</i>	<b>12527</b>	<b>11109</b>	<b>12634</b>	<b>13143</b>	<b>13550</b>	<b>13769</b>	<b>13462</b>	<b>14088</b>	<b>14463</b>	<b>14365</b>
Processing	<i>mil bu</i>	<b>6315</b>	<b>5961</b>	<b>6109</b>	<b>6193</b>	<b>6308</b>	<b>6310</b>	<b>6312</b>	<b>6314</b>	<b>6316</b>	<b>6318</b>
of which, Corn Eth	<i>mil bu</i>	<b>4915</b>	<b>4551</b>	<b>4689</b>	<b>4758</b>	<b>4858</b>	<b>4848</b>	<b>4838</b>	<b>4828</b>	<b>4818</b>	<b>4808</b>
(Corn & milo eth)	<i>bil gal</i>	<b>13.8</b>	<b>12.9</b>	<b>13.3</b>	<b>13.6</b>	<b>13.9</b>	<b>14.0</b>	<b>14.0</b>	<b>14.0</b>	<b>14.1</b>	<b>14.1</b>
Exports	<i>mil bu</i>	<b>1543</b>	<b>735</b>	<b>1300</b>	<b>1700</b>	<b>1917</b>	<b>2009</b>	<b>1900</b>	<b>2199</b>	<b>2297</b>	<b>2397</b>
Feed/Residual Use	<i>mil bu</i>	<b>4669</b>	<b>4413</b>	<b>5225</b>	<b>5250</b>	<b>5325</b>	<b>5450</b>	<b>5250</b>	<b>5575</b>	<b>5850</b>	<b>5650</b>
Total Use	<i>mil bu</i>	<b>12527</b>	<b>11109</b>	<b>12634</b>	<b>13143</b>	<b>13550</b>	<b>13769</b>	<b>13462</b>	<b>14088</b>	<b>14463</b>	<b>14365</b>
Carry-out	<i>mil bu</i>	<b>989</b>	<b>823</b>	<b>2202</b>	<b>2362</b>	<b>2347</b>	<b>2235</b>	<b>1601</b>	<b>1520</b>	<b>2736</b>	<b>2994</b>
Carryout-to-Use Ratio	<i>pct</i>	<b>7.9%</b>	<b>7.4%</b>	<b>17.4%</b>	<b>18.0%</b>	<b>17.3%</b>	<b>16.2%</b>	<b>11.9%</b>	<b>10.8%</b>	<b>18.9%</b>	<b>20.8%</b>
Farm Price	<i>\$/bu</i>	<b>6.22</b>	<b>6.95</b>	<b>4.15</b>	<b>4.09</b>	<b>4.15</b>	<b>4.32</b>	<b>4.43</b>	<b>4.44</b>	<b>4.36</b>	<b>4.21</b>

Area planted held at high level to illustrate an approaching problem, with lower farm prices (greater carryout-to-use ratio plus crude oil price in \$85-90/barrel range). Note Fuel Ethanol demand peaks at about 14 bil gals.

## CORN PRODUCTION BY AGRICULTURAL STATISTICS DISTRICT (ASD), 13-14, MIL BU

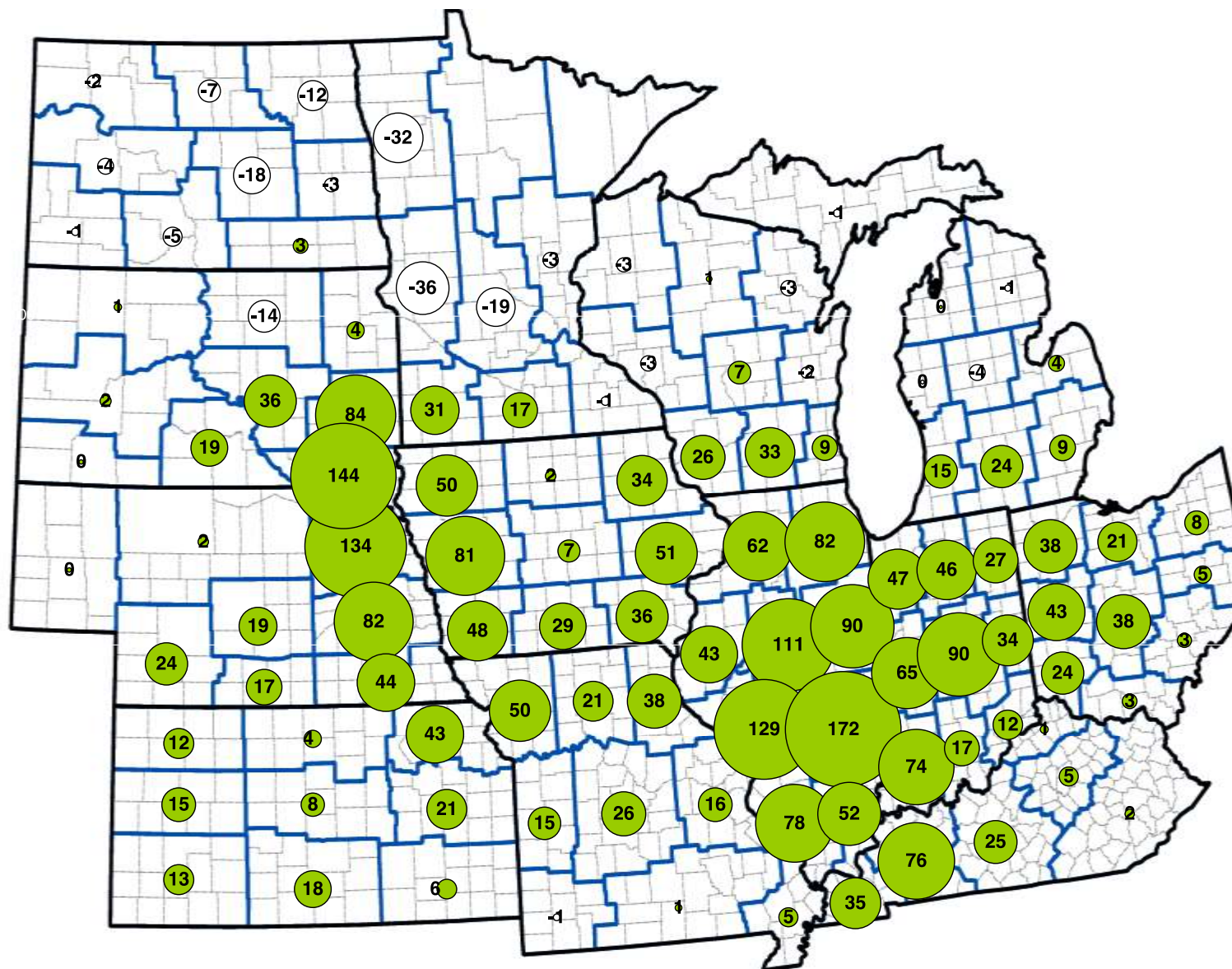
PRX\_ASD\_CB\_Corn\_Start, GTB-13-11, Nov-08-13





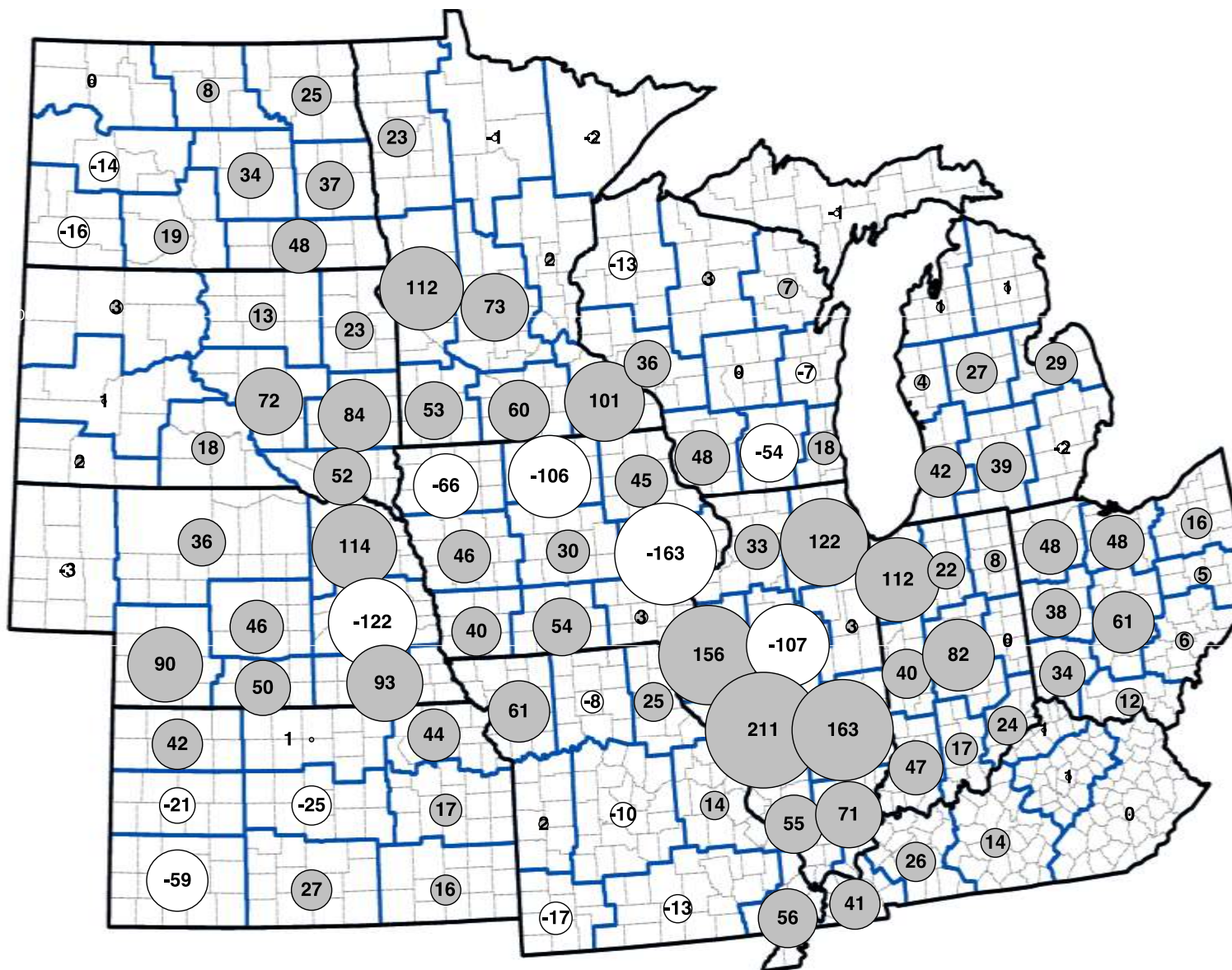
## CORN PRODUCTION CHANGE BY AGRICULTURAL STATISTICS DISTRICT (ASD), 12-13 TO 13-14, MIL BU

PRX\_ASD\_CB\_Corn\_Start, GTB-13-11, Nov-08-13



## CORN NET EXPORTS (+) & NET IMPORTS (-) BY AGRICULTURAL STATISTICS DISTRICT (ASD), 13-14, MIL BU

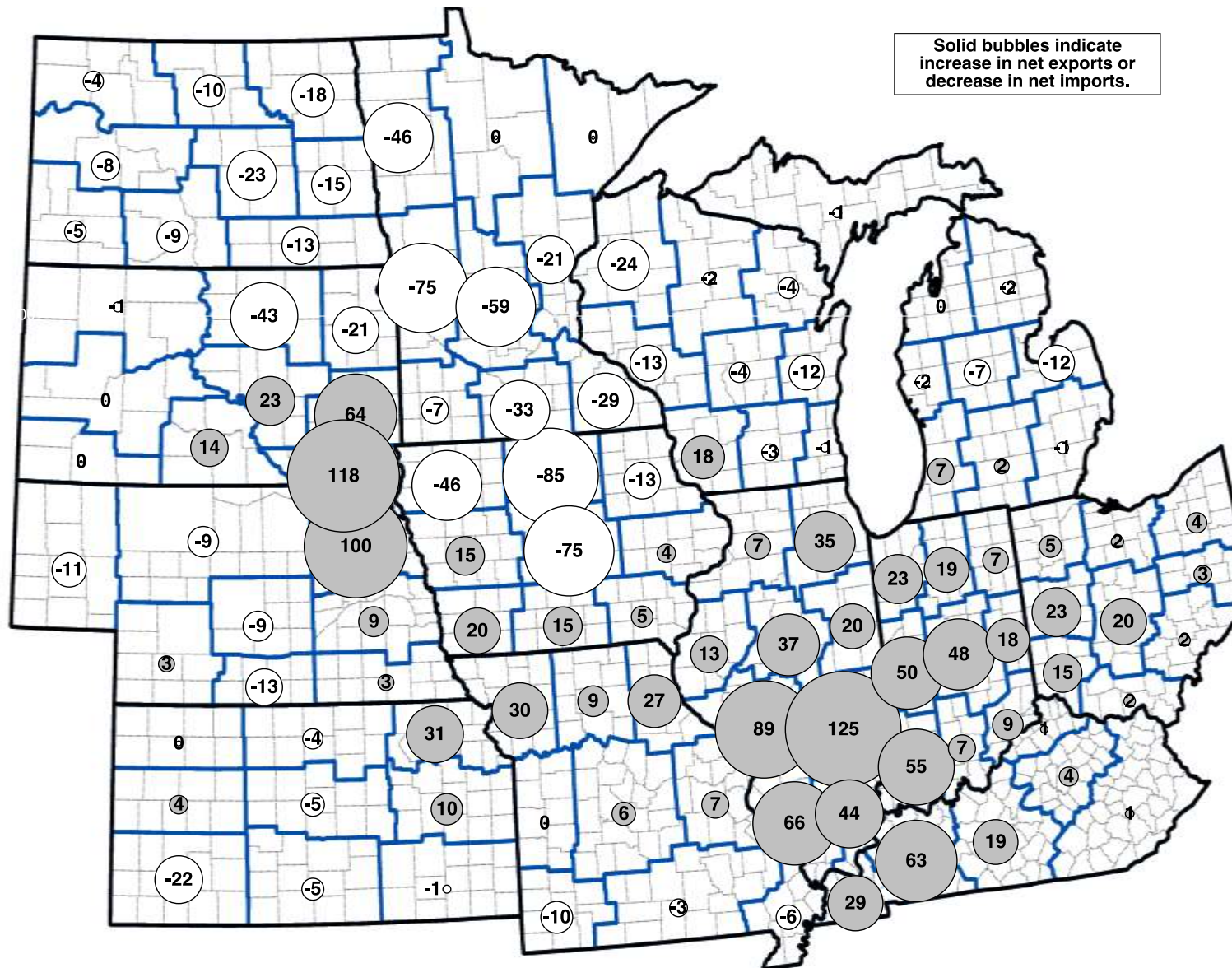
PRX\_ASD\_CB\_Corn\_Start, GTB-13-11, Nov-08-13





## CORN NET EXPORTS & NET IMPORTS CHANGE BY AGRICULTURAL STATISTICS DISTRICT (ASD), 12-13 TO 13-14, MIL BU

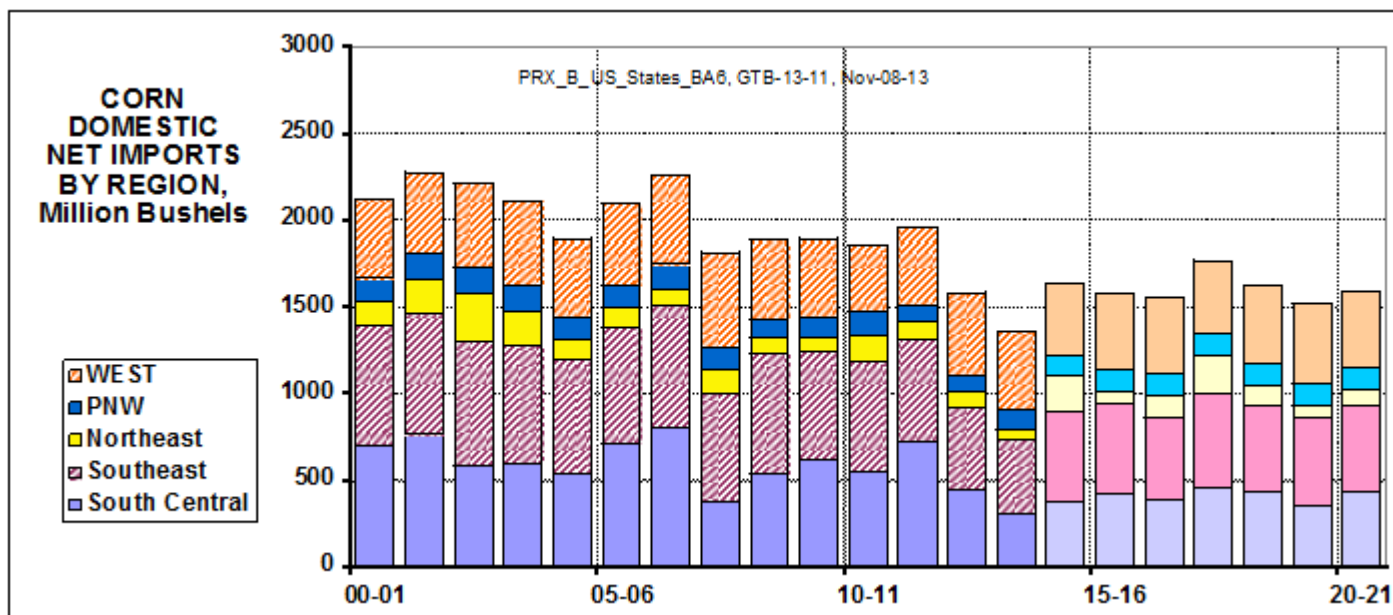
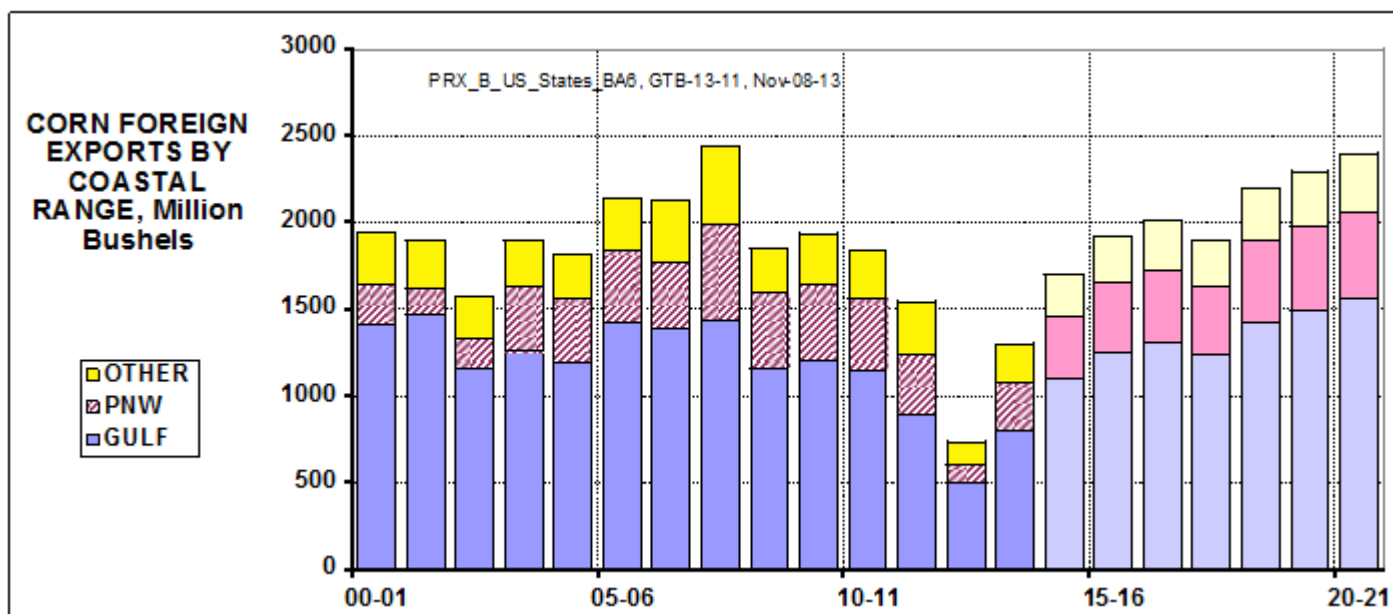
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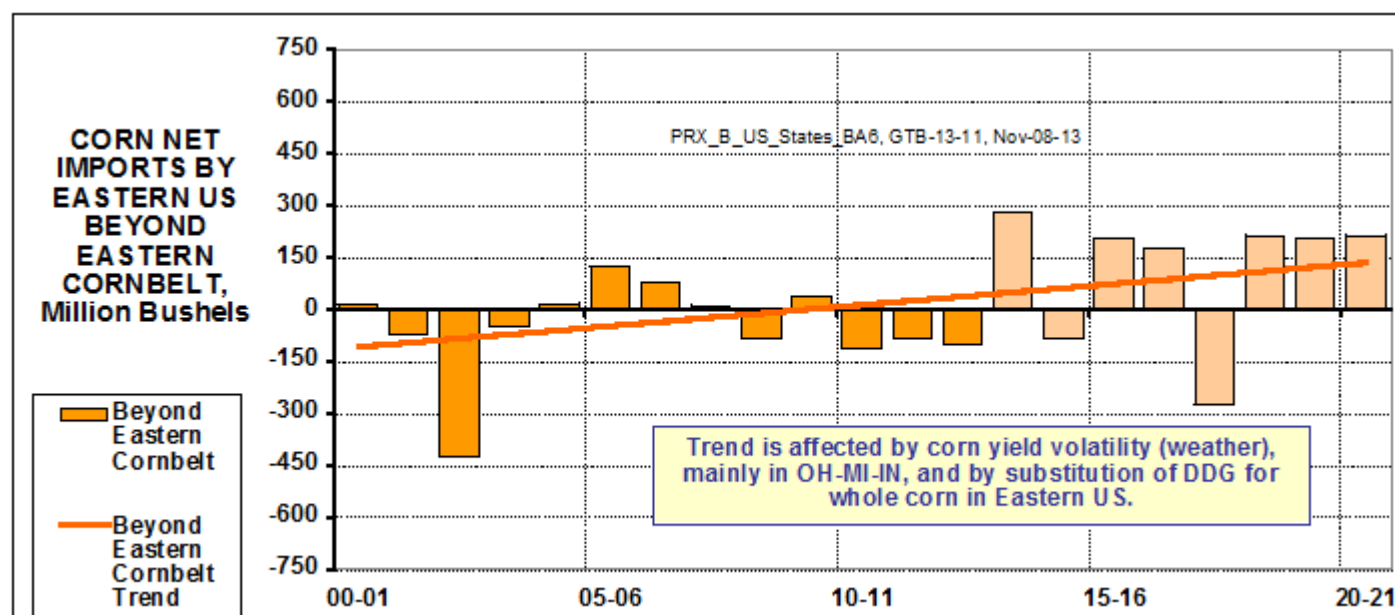
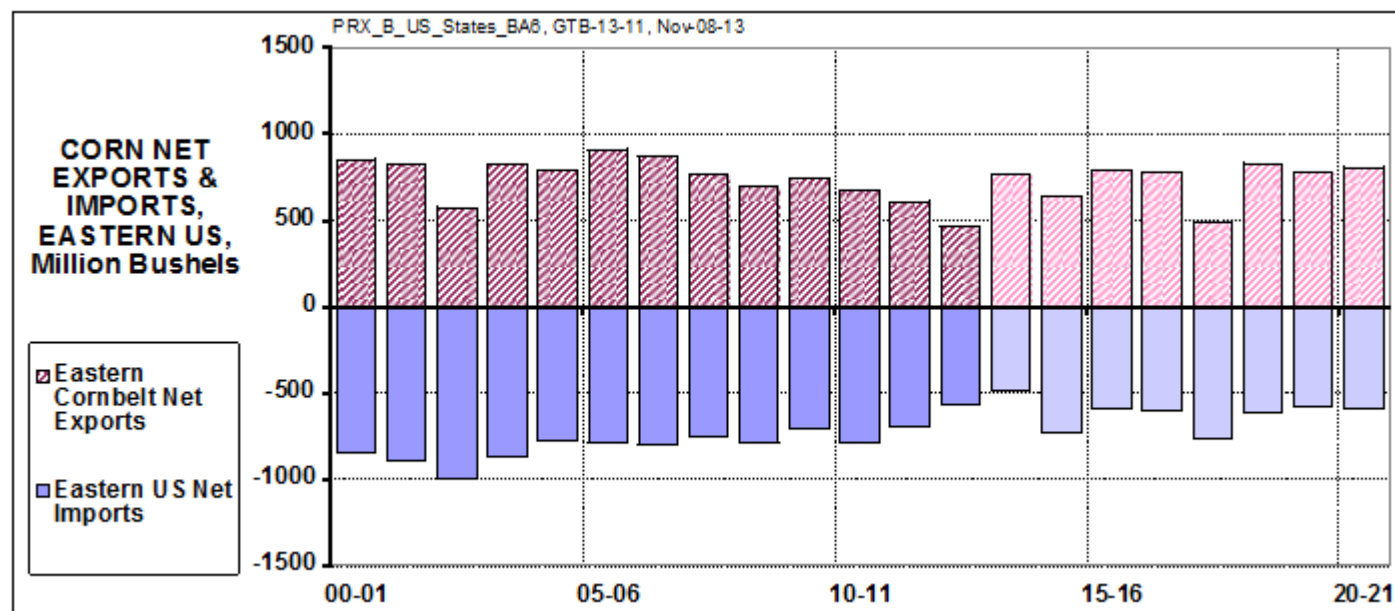


## CORN NET EXPORTS (+)/IMPORTS (-) BY STATE, 2008-2020

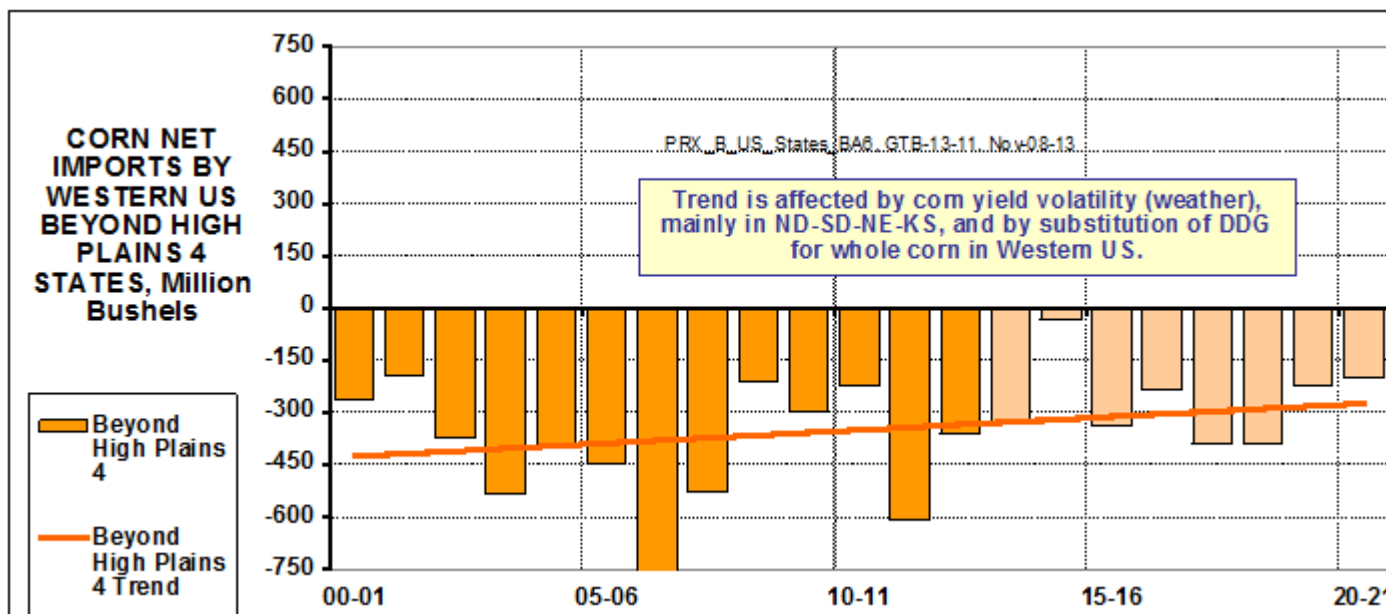
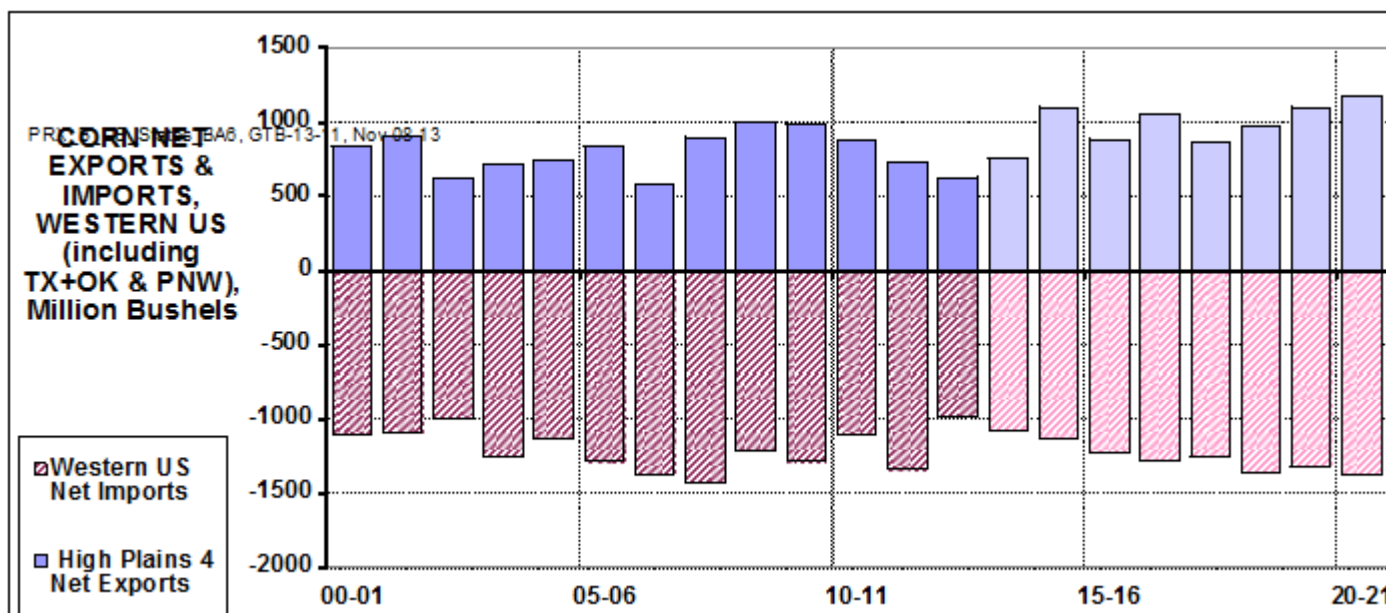
PRX\_B\_US\_States\_BA6, GTB-13-11, Nov-08-13

Region	State	Crop Year (Sep-Aug)													Growth vs. 2009
		08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	
		milbu	milbu	milbu	milbu	milbu	milbu	milbu	milbu	milbu	milbu	milbu	milbu	milbu	milbu
CCB5	IA	346	352	343	490	43	-115	158	102	146	556	278	274	398	46
CCB5	IL	1074	1050	914	868	271	704	601	746	777	670	903	837	558	-492
CCB5	MN	498	464	572	509	694	421	648	613	482	795	612	574	812	348
CCB5	MO	96	131	126	78	50	109	73	227	192	118	104	240	101	-29
CCB5	WI	74	73	183	193	82	38	145	113	99	159	102	52	144	71
CCB5		2088	2070	2138	2138	1140	1157	1624	1801	1696	2297	1998	1977	2014	-56
ECB3	IN	366	337	281	215	116	354	277	364	427	263	362	387	377	40
ECB3	MI	139	154	136	167	157	142	160	144	97	139	152	130	178	25
ECB3	OH	192	257	255	226	192	268	203	285	252	91	316	262	250	-7
ECB3		697	748	672	608	465	763	640	794	777	494	830	779	806	58
HP4	KS	172	235	191	85	34	40	174	125	90	75	48	121	123	-112
HP4	ND	150	151	130	36	245	141	287	264	273	290	258	211	321	169
HP4	NE	475	361	419	380	232	306	316	184	395	270	370	428	409	48
HP4	SD	200	241	136	228	113	270	320	309	291	225	293	340	322	81
HP4		997	988	877	729	624	758	1096	882	1049	860	969	1099	1175	186
CB12		3782	3806	3687	3475	2229	2679	3361	3477	3522	3651	3797	3855	3995	189
NE 7		-89	-77	-161	-98	-93	-55	-206	-78	-130	-224	-118	-77	-104	-27
PNW 3		-104	-112	-133	-102	-97	-110	-112	-118	-125	-125	-126	-123	-123	-11
SC 7		-526	-563	-550	-686	-476	-228	-360	-373	-323	-441	-371	-285	-388	175
SE 6		-693	-631	-625	-591	-471	-427	-517	-512	-470	-544	-498	-498	-487	144
W 10		-465	-459	-383	-451	-477	-451	-418	-442	-432	-417	-451	-464	-441	19
Unallocated*		-58	-30	0	-5	120	-107	-48	-37	-32	0	-34	-112	-55	-25
*Overall discrepancy in non-cornbelt state estimates.															
Total Domestic		-1934	-1872	-1853	-1932	-1494	-1379	-1661	-1560	-1513	-1751	-1598	-1558	-1598	274
Total Foreign		1849	1934	1834	1543	735	1300	1700	1917	2009	1900	2199	2297	2397	463
via GULF		1157	1198	1152	894	500	805	1105	1246	1306	1235	1429	1493	1558	360
via PACIFIC		434	447	414	341	100	270	357	403	422	399	462	482	503	56
via OTHER		257	289	268	308	135	225	238	268	281	266	308	322	336	47









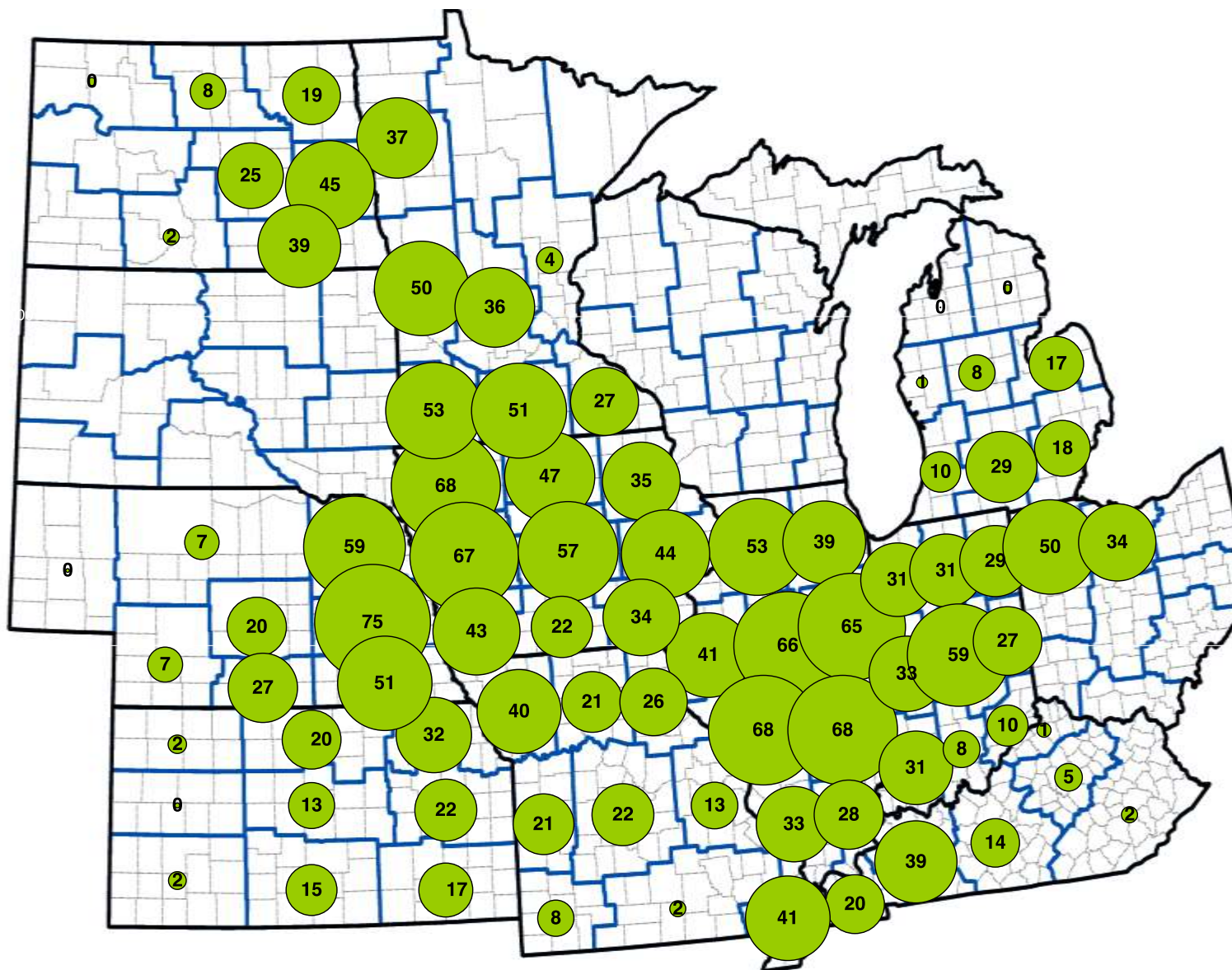
## UNITED STATES SOYBEAN SUPPLY-DEMAND

PRX\_BS1\_OverviewDeck\_Start, GTB-13-11, Nov-25-13

Item	Unit	Crop year (Sep-Aug)									
		11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21
Carry-in	<i>mil bu</i>	215	169	141	173	172	247	254	253	220	373
Area planted	<i>mil ac</i>	75.0	77.2	76.5	80.0	80.0	78.0	78.0	80.0	80.0	80.0
Area harvested	<i>mil ac</i>	73.8	76.1	75.7	79.1	79.1	77.2	77.2	79.1	79.1	79.1
Yield	<i>bu/ac</i>	41.9	39.9	43.0	40.6	42.9	45.0	42.7	39.0	48.6	49.2
Production	<i>mil bu</i>	3094	3034	3258	3211	3398	3474	3297	3084	3846	3897
Supply	<i>mil bu</i>	3325	3238	3413	3389	3575	3727	3556	3342	4071	4275
Carry-out	<i>mil bu</i>	169	141	173	172	247	254	253	220	373	427
Disappearance (Use)	<i>mil bu</i>	3156	3097	3240	3217	3328	3473	3303	3123	3698	3848
Seed/Residual Use	<i>mil bu</i>	91	93	115	150	150	150	150	150	150	150
Crush	<i>mil bu</i>	1703	1690	1675	1625	1675	1750	1650	1550	1750	1775
Domestic Use	<i>mil bu</i>	1794	1783	1790	1775	1825	1900	1800	1700	1900	1925
Foreign Exports	<i>mil bu</i>	1362	1314	1450	1442	1503	1573	1503	1423	1798	1923
<b>Farm Price</b>	<i>cts/bu</i>	1250	1430	1115	1182	1096	1072	1104	1183	1114	1102
Soyoil domestic use	<i>mil lbs</i>	14882	12348	12122	12400	12500	12600	12700	12800	12900	13000
Soyoil industrial use	<i>mil lbs</i>	3100	4952	5378	5475	5571	5668	5765	5862	5958	6055
Soyoil Biodiesel	<i>mil gals</i>	425	678	737	750	763	776	790	803	816	829
Corn oil industrial use	<i>mil gals</i>	245	253	263	268	275	276	276	276	277	277

## SOYBEAN PRODUCTION BY AGRICULTURAL STATISTICS DISTRICT (ASD), 13-14, MIL BU

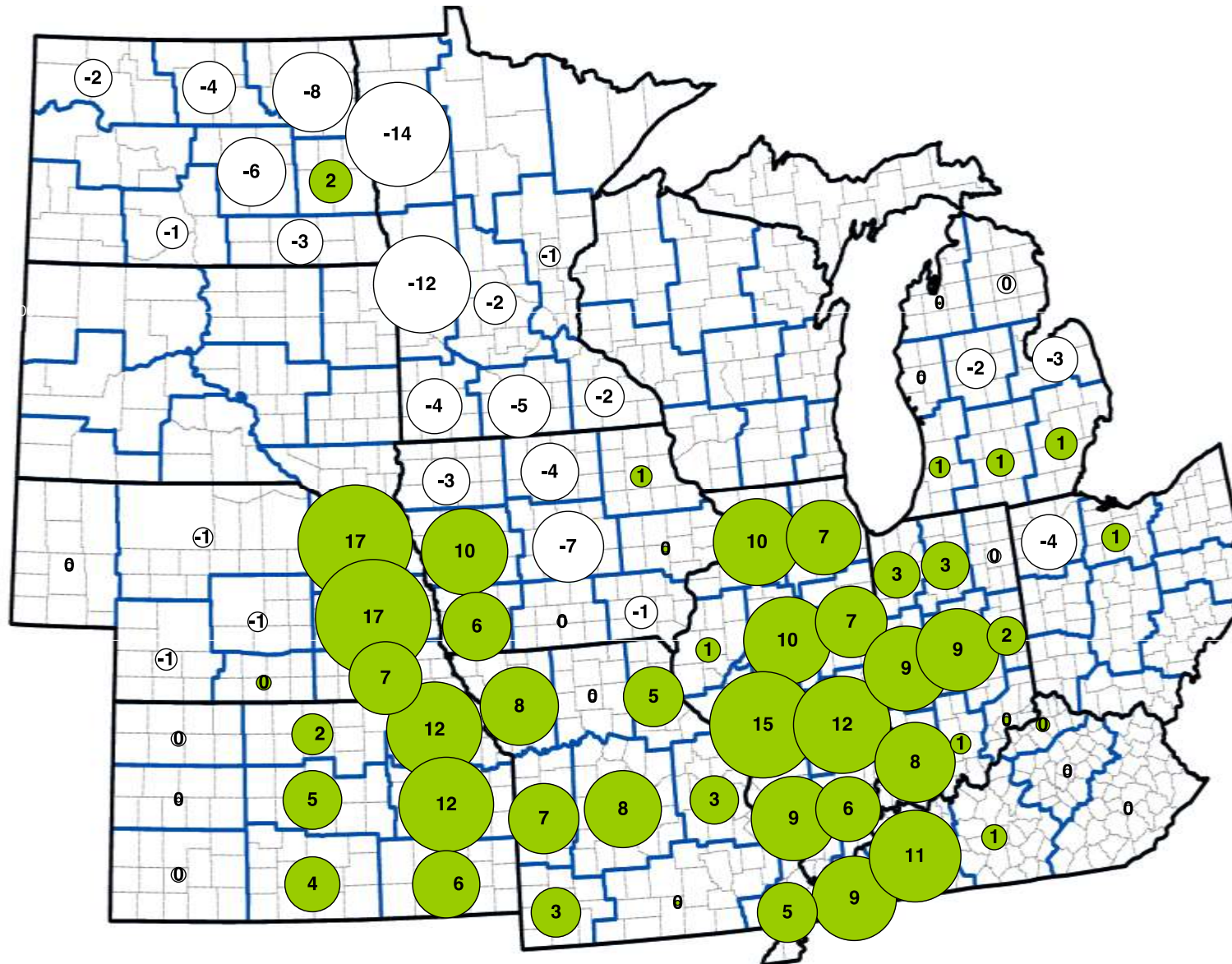
PRX\_ASD\_CB\_Soybeans\_Start, GTB-13-11, Nov-08-13





**SOYBEAN PRODUCTION CHANGE BY  
AGRICULTURAL STATISTICS DISTRICT (ASD), 12-13 TO 13-14, MIL BU**

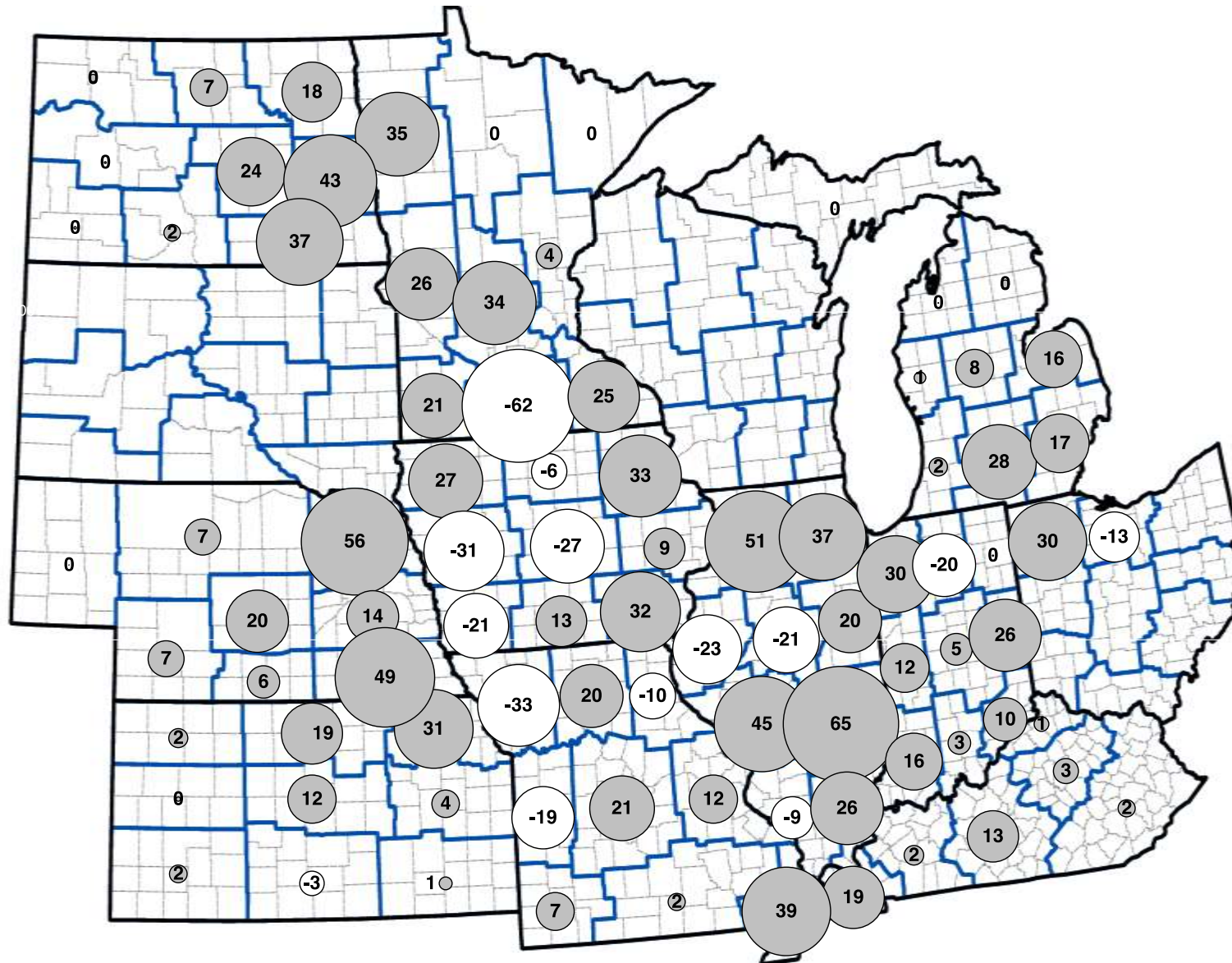
PRX\_ASD\_CB\_Soybeans\_Start, GTB-13-11, Nov-08-13





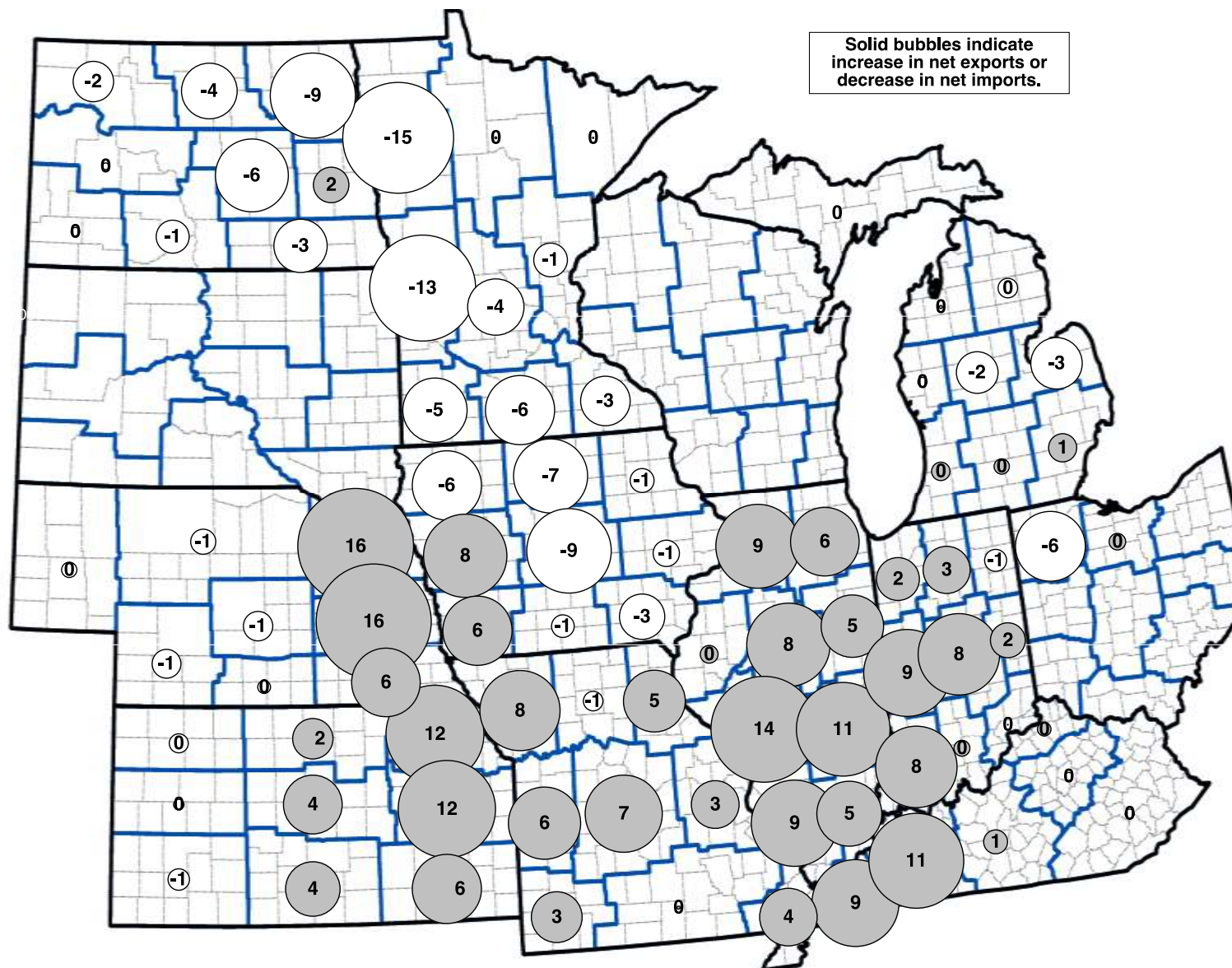
**SOYBEAN NET EXPORTS (+) & NET IMPORTS (-) BY  
AGRICULTURAL STATISTICS DISTRICT (ASD), 13-14, MIL BU**

PRX\_ASD\_CB\_Soybeans\_Start, GTB-13-11, Nov-08-13



## SOYBEAN NET EXPORTS & NET IMPORTS CHANGE BY AGRICULTURAL STATISTICS DISTRICT (ASD), 12-13 TO 13-14, MIL BU

PRX\_ASD\_CB\_Soybeans\_Start, GTB-13-11, Nov-08-13



## SOYBEAN NET EXPORTS (+)/IMPORTS (-) BY STATE

PRX\_BS3\_SoybeanState\_Start, GTB-13-11, Nov-08-13

Region	State	Crop Year (Sep-Aug)													Growth 2009
		08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	
		milbu	milbu	milbu	milbu	milbu	milbu	milbu	milbu	milbu	milbu	milbu	milbu	milbu	milbu
CCB5	IA	87	92	115	103	41	29	134	95	86	152	20	121	182	90
CCB5	IL	172	159	198	164	124	191	188	191	188	182	149	237	209	51
CCB5	MN	97	105	149	107	136	83	178	164	123	186	112	84	189	84
CCB5	MO	79	71	59	37	5	39	32	70	78	62	48	124	74	3
CCB5	WI	55	61	79	74	69	60	87	73	67	80	52	61	81	20
CCB5		489	488	600	485	376	402	618	593	543	663	382	627	735	247
ECB3	IN	79	86	83	67	53	82	77	113	119	80	79	138	122	35
ECB3	MI	62	69	77	77	76	72	85	74	59	79	56	76	80	11
ECB3	OH	59	113	107	117	105	110	93	117	107	55	113	133	128	15
ECB3		200	269	267	261	234	265	256	303	285	214	248	346	330	61
HP4	KS	67	103	81	47	31	68	81	39	92	53	59	134	117	14
HP4	ND	102	110	128	112	158	130	165	148	153	151	136	101	172	62
HP4	NE	143	170	175	178	123	158	86	143	183	145	170	184	214	43
HP4	SD	110	144	121	124	116	149	147	137	121	118	108	126	141	-3
HP4		421	527	505	461	428	505	479	466	550	467	473	545	643	116
CB12		1111	1284	1372	1206	1039	1171	1353	1362	1378	1345	1103	1518	1708	424
NE 7		8	21	10	22	33	28	12	39	24	1	32	38	19	-2
PNW 3		0	0	0	0	0	0	0	0	0	0	0	0	0	0
SC 7		247	298	248	251	303	358	207	228	296	288	379	373	336	37
SE 6		-118	-114	-139	-150	-114	-131	-149	-136	-143	-151	-116	-134	-154	-40
W 10		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unallocated		30	14	27	34	53	25	19	11	19	20	24	3	14	0
US		1277	1503	1518	1362	1314	1450	1442	1503	1573	1503	1423	1798	1923	420
via GULF		746	769	837	758	738	821	824	866	914	881	841	1072	1156	388
via PNW		317	312	282	254	246	273	273	286	301	289	275	350	376	64
via OTHER		214	422	400	350	330	355	345	350	357	332	306	376	391	-32

## RIVER GULF SOYBEANS, CORN, & MEAL EXPORTS, 1990-2020

PRX\_CoastalShareAnal, GTB-13-11, Nov-08-13

Crop	US	US	US	US	US	River Gulf Soy-beans	River Gulf Soy-meal	River Gulf Corn	River Gulf DDG	River Gulf Total
Year	Soy-beans	Soy-meal	Corn	DDG	Total	mmt	mmt	mmt	mmt	mmt
90-91	15.2	4.9	43.8			12.5	3.6	33.5		
91-92	18.6	6.2	40.2			14.6	4.6	30.8		
92-93	20.9	5.9	42.2			15.4	4.2	32.4		
93-94	16.1	4.7	33.7			12.7	3.3	27.6		
94-95	22.8	6.0	55.3			16.3	4.2	36.5		
95-96	23.2	5.1	56.6			16.1	4.1	39.8		
96-97	24.0	6.1	45.5			16.9	5.0	30.7		
97-98	23.7	8.1	37.4	0.6	69.9	16.8	5.4	27.7	0.6	50.5
98-99	21.9	6.3	50.3	0.7	79.2	14.8	3.9	37.1	0.7	56.4
99-00	26.9	6.5	49.2	0.8	83.4	18.5	4.2	35.6	0.7	59.0
00-01	27.5	6.7	49.3	0.8	84.3	17.7	4.3	35.5	0.7	58.2
01-02	29.3	7.0	48.2	0.9	85.3	19.7	4.0	37.0	0.8	61.5
02-03	28.7	5.5	40.0	0.8	75.0	18.9	3.5	29.3	0.7	52.4
03-04	24.1	4.0	48.2	0.7	77.1	14.9	2.3	31.5	0.6	49.4
04-05	30.0	5.5	46.1	1.0	82.5	18.0	3.2	29.8	0.6	51.6
05-06	25.8	5.8	54.4	1.2	87.2	14.3	3.2	33.8	0.6	51.9
06-07	30.6	8.0	53.9	1.5	94.0	16.0	3.6	32.8	0.5	52.9
07-08	31.5	8.3	61.9	3.9	105.7	15.2	3.3	32.8	1.4	52.8
08-09	34.7	7.8	47.0	5.0	94.4	20.3	3.1	27.9	1.7	53.0
09-10	40.9	9.9	49.1	8.3	108.2	20.9	4.1	28.3	2.3	55.6
10-11	41.3	8.0	46.6	8.3	104.2	22.8	3.5	27.9	2.6	56.7
11-12	37.1	7.8	39.2	8.6	92.6	20.6	3.3	21.9	2.4	48.2
12-13	35.8	8.8	18.7	8.1	71.3	20.1	3.7	10.9	2.2	37.0
13-14	39.5	8.7	33.0	8.8	90.0	22.4	3.7	19.6	2.4	48.0
14-15	39.2	6.7	43.2	9.1	98.2	22.4	2.8	25.9	2.5	53.6
15-16	40.9	7.6	48.7	9.3	106.5	23.6	3.2	29.5	2.5	58.8
16-17	42.8	9.0	51.0	9.6	112.5	24.9	3.8	31.3	2.6	62.5
17-18	40.9	6.6	48.3	9.9	105.7	24.0	2.8	29.9	2.6	59.3
18-19	38.7	4.0	55.9	10.2	108.7	22.9	1.7	35.0	2.7	62.3
19-20	48.9	7.9	58.3	10.4	125.6	29.2	3.3	37.0	2.7	72.2
20-21	52.3	8.9	60.9	10.7	132.8	31.5	3.7	39.0	2.8	77.0
Annual growth rate, 2010-2020										
	2.4%	1.0%	2.7%	2.6%	2.5%	3.3%	0.6%	3.4%	0.9%	3.1%

With forecast of China's imports up ~2 mmt per year, then growth rates for US grain exports are strong, led by corn and led by River Gulf—whose share of US shipments will be helped by expanded Panama Canal.



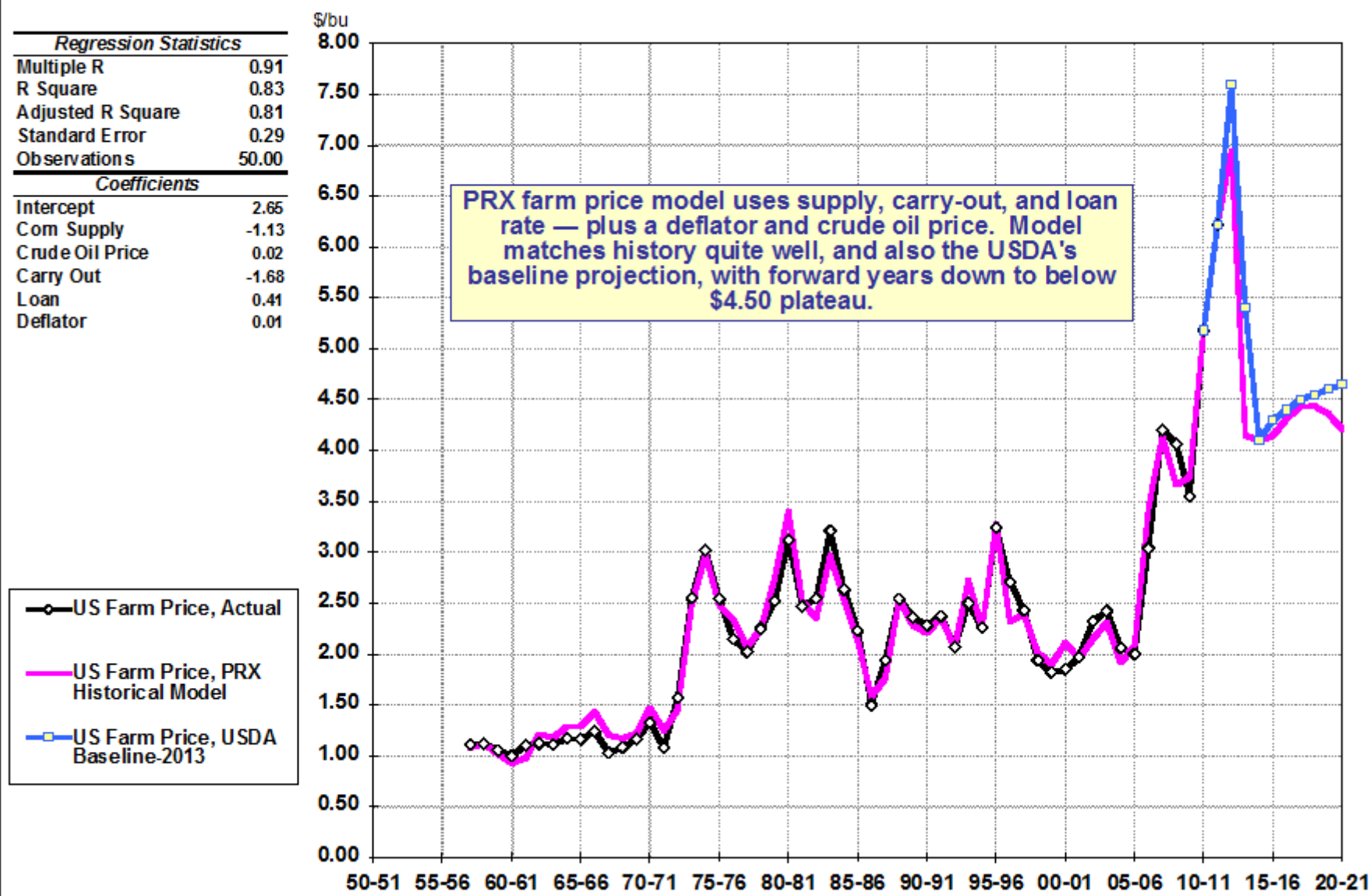
# PNW SOYBEANS, CORN, & MEAL EXPORTS, 1990-2020

PRX\_CoastalShareAnal, GTB-13-11, Nov-08-13

Crop	US	US	US	US	US	PNW	PNW	PNW	PNW	PNW
Year	Soy-beans	Soy-meal	Corn	DDG	Total	Soy-beans	Soy-meal	Corn	DDG	Total
	mmt	mmt	mmt	mmt	mmt	mmt	mmt	mmt	mmt	mmt
90-91	15.2	4.9	43.8			0.5	0.0	7.1		
91-92	18.6	6.2	40.2			1.2	0.0	7.6		
92-93	20.9	5.9	42.2			1.4	0.0	6.0		
93-94	16.1	4.7	33.7			0.5	0.0	3.5		
94-95	22.8	6.0	55.3			1.9	0.0	13.6		
95-96	23.2	5.1	56.6			2.0	0.0	11.9		
96-97	24.0	6.1	45.5			1.6	0.0	11.0		
97-98	23.7	8.1	37.4	0.6	69.9	1.3	0.3	6.0	0.0	7.6
98-99	21.9	6.3	50.3	0.7	79.2	0.6	0.3	6.3	0.0	7.2
99-00	26.9	6.5	49.2	0.8	83.4	1.7	0.1	7.8	0.0	9.6
00-01	27.5	6.7	49.3	0.8	84.3	2.9	0.2	5.8	0.0	8.9
01-02	29.3	7.0	48.2	0.9	85.3	3.0	0.4	3.8	0.1	7.3
02-03	28.7	5.5	40.0	0.8	75.0	4.0	0.3	4.4	0.3	8.9
03-04	24.1	4.0	48.2	0.7	77.1	4.6	0.4	9.5	0.0	14.5
04-05	30.0	5.5	46.1	1.0	82.5	6.5	0.6	8.9	0.1	16.2
05-06	25.8	5.8	54.4	1.2	87.2	6.1	0.3	10.1	0.1	16.6
06-07	30.6	8.0	53.9	1.5	94.0	7.4	0.4	8.5	0.2	16.4
07-08	31.5	8.3	61.9	3.9	105.7	9.5	0.8	12.3	0.3	22.9
08-09	34.7	7.8	47.0	5.0	94.4	8.6	0.6	9.1	0.3	18.6
09-10	40.9	9.9	49.1	8.3	108.2	8.5	0.7	9.7	0.5	19.4
10-11	41.3	8.0	46.6	8.3	104.2	7.7	0.9	9.3	0.5	18.4
11-12	37.1	7.8	39.2	8.6	92.6	6.9	0.9	7.9	0.5	16.2
12-13	35.8	8.8	18.7	8.1	71.3	6.7	1.1	3.8	0.5	12.1
13-14	39.5	8.7	33.0	8.8	90.0	7.4	1.1	6.7	0.6	15.8
14-15	39.2	6.7	43.2	9.1	98.2	7.4	0.9	8.8	0.6	17.7
15-16	40.9	7.6	48.7	9.3	106.5	7.8	1.0	10.0	0.7	19.4
16-17	42.8	9.0	51.0	9.6	112.5	8.2	1.2	10.5	0.7	20.6
17-18	40.9	6.6	48.3	9.9	105.7	7.9	0.9	10.0	0.7	19.5
18-19	38.7	4.0	55.9	10.2	108.7	7.5	0.6	11.6	0.8	20.4
19-20	48.9	7.9	58.3	10.4	125.6	9.5	1.1	12.2	0.8	23.6
20-21	52.3	8.9	60.9	10.7	132.8	10.2	1.3	12.8	0.9	25.1
Annual growth rate, 2010-2020	2.4%	1.0%	2.7%	2.6%	2.5%	2.9%	3.3%	3.2%	5.6%	3.2%

With forecast of China's imports up ~2 mmt per year, then growth rates for US grain exports are strong, finally pushing capacity of US export system—including via PNW and most other ranges.

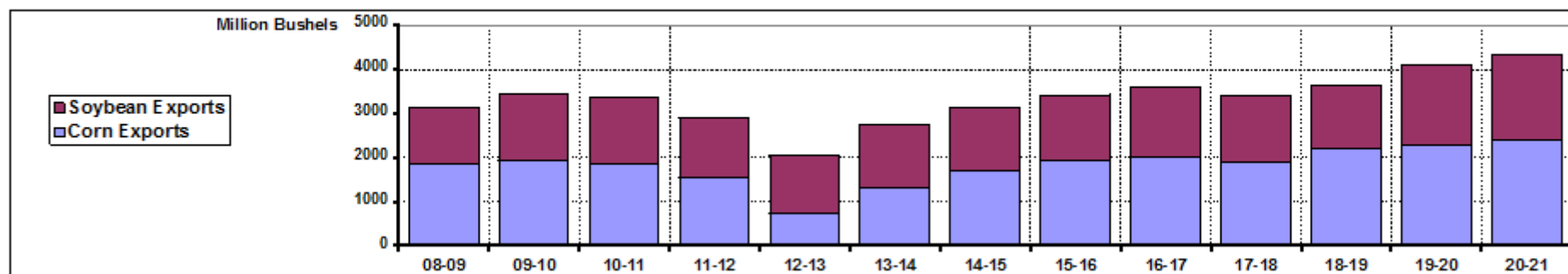
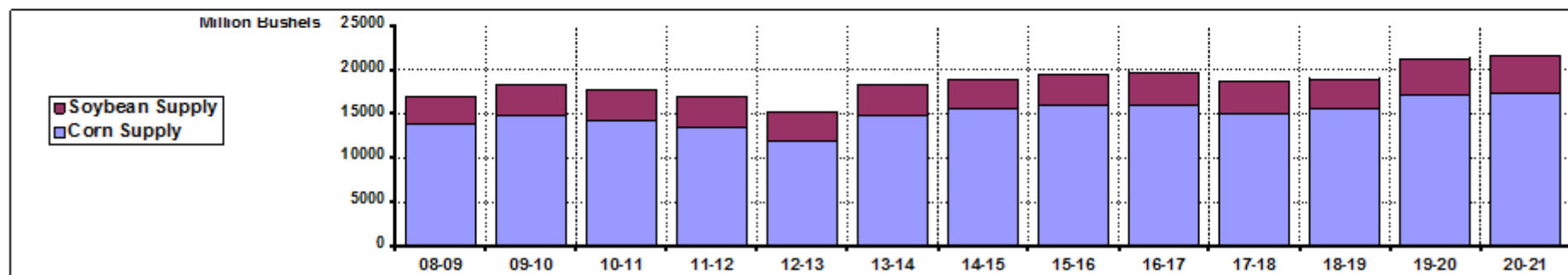
## US CORN FARM PRICE, 1957-2020, ACTUAL AND MODELS

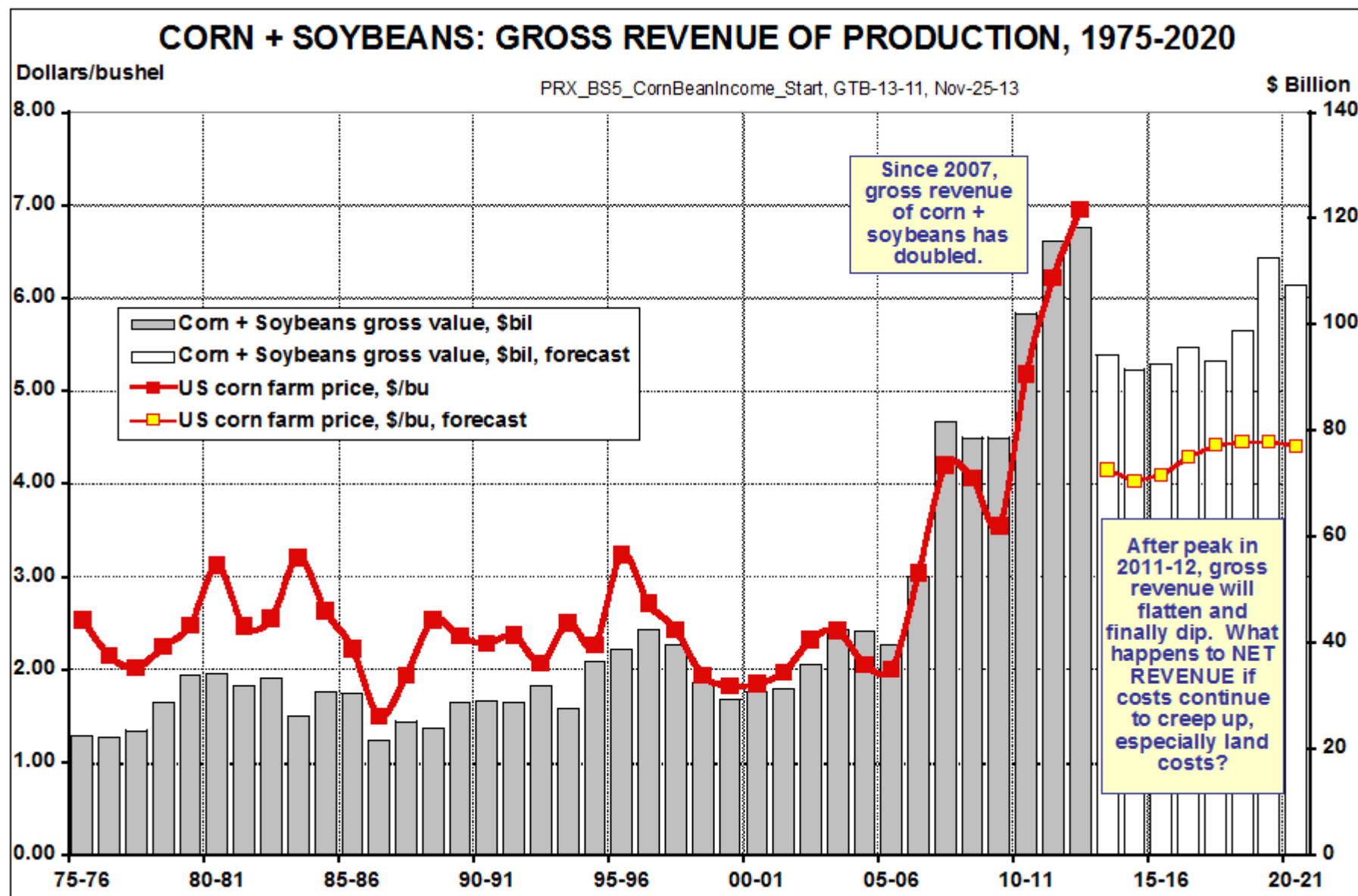


## UNITED STATES CORN & SOYBEANS: KEY SUPPLY-DEMAND FACTORS

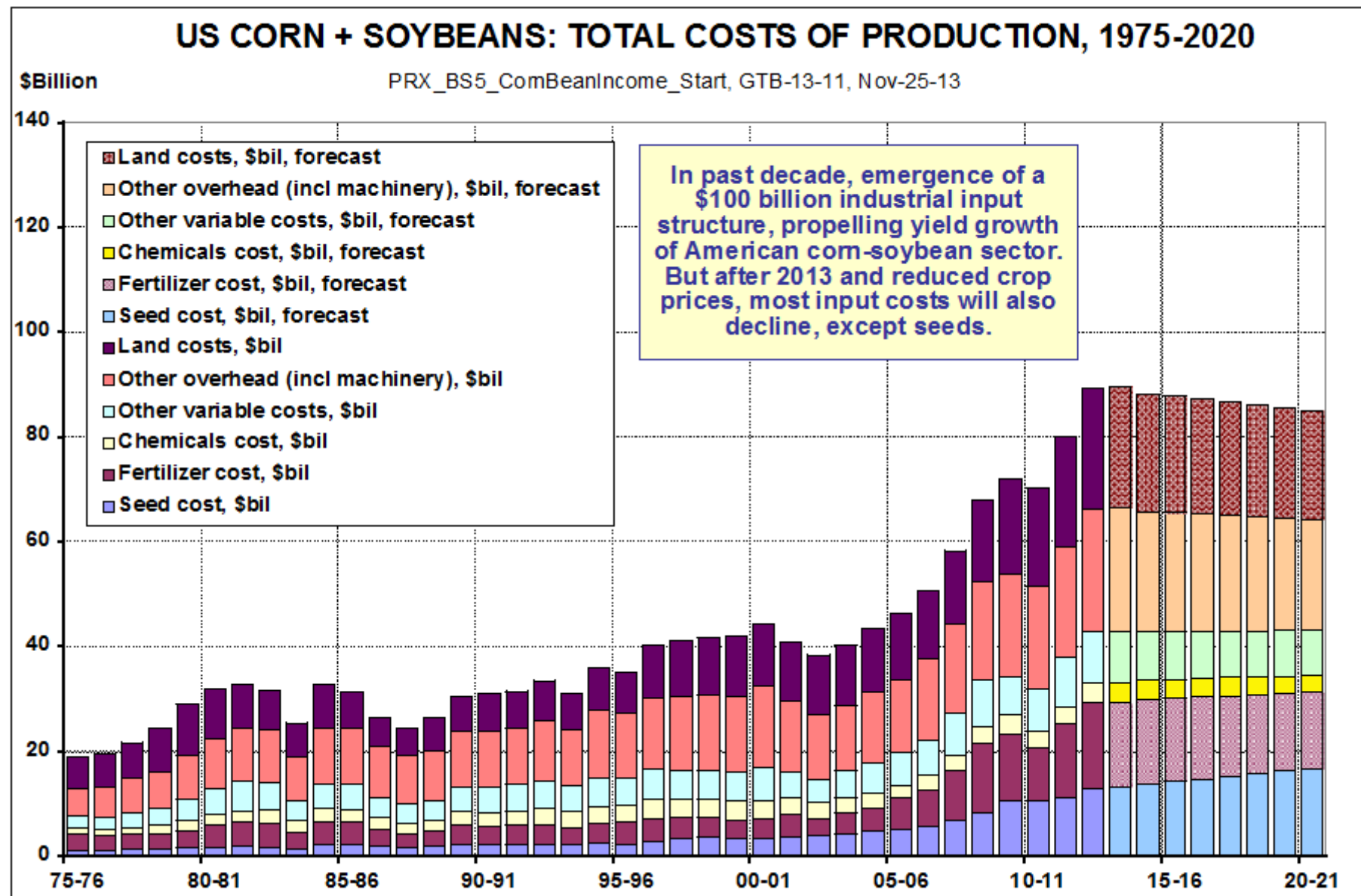
© PRX 2013, File PRX\_BS2\_CornStates\_Start, Sep-12-13

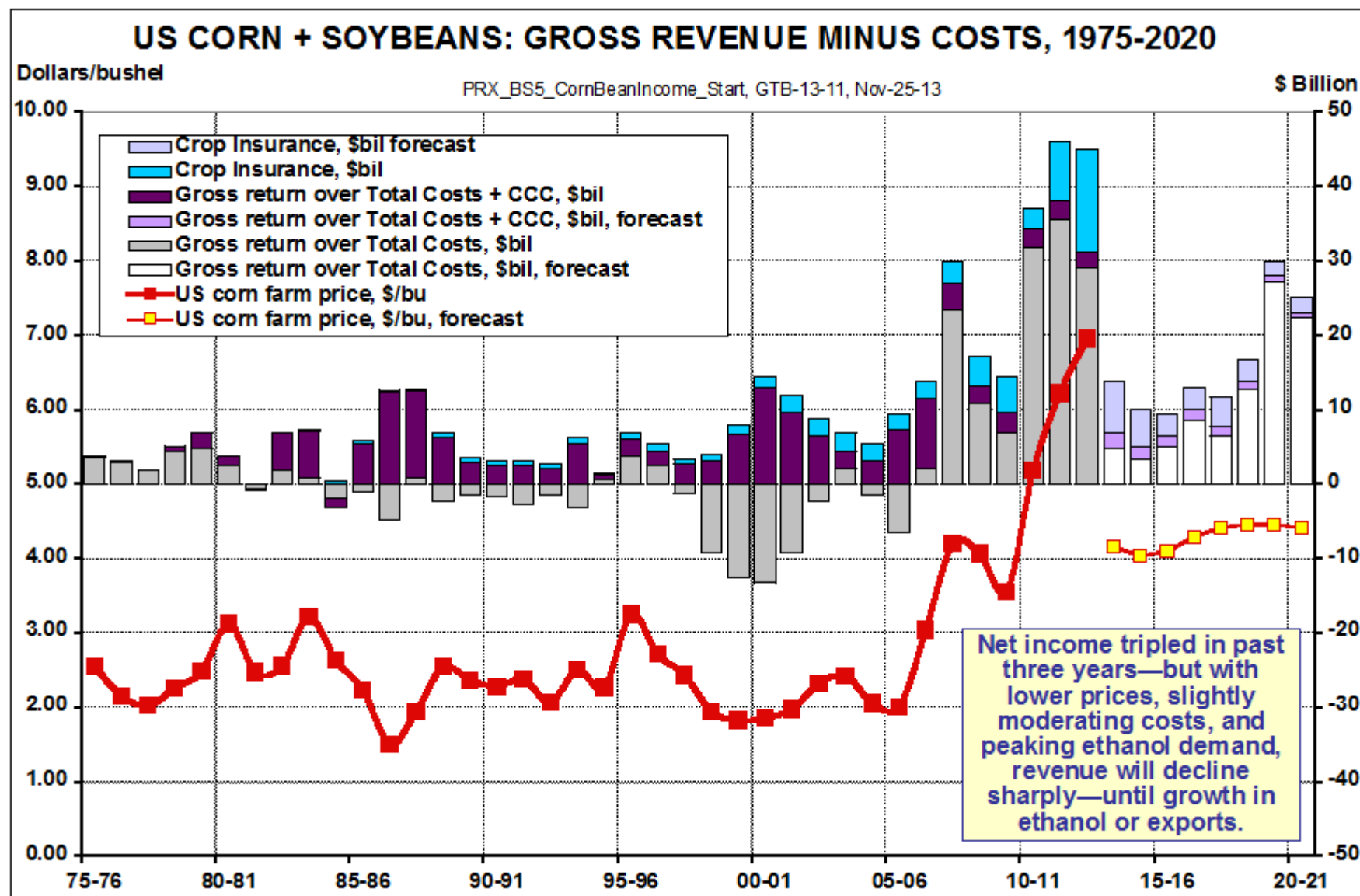
Item	Unit	Crop year (Sep-Aug)												
		08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21
Corn Carry-in	mil bu	1624	1673	1708	1128	989	823	2202	2362	2347	2235	1601	1520	2736
Soybean Carry-in	mil bu	205	138	151	215	169	141	173	172	247	254	253	220	373
Corn Supply	mil bu	13730	14773	14182	13516	11931	14836	15506	15897	16004	15063	15609	17199	17359
Soybean Supply	mil bu	3185	3512	3494	3325	3238	3413	3389	3575	3727	3556	3342	4071	4275
Corn Exports	mil bu	1849	1934	1834	1543	735	1300	1700	1917	2009	1900	2199	2297	2397
Soybean Exports	mil bu	1277	1503	1518	1362	1314	1450	1442	1503	1573	1503	1423	1798	1923
Corn Farm Price	\$/bu	4.06	3.55	5.18	6.22	6.95	4.15	4.09	4.15	4.32	4.43	4.44	4.36	4.21
Soybean Farm Price	\$/bu	9.97	9.59	11.30	12.50	14.30	11.15	11.52	10.87	10.80	11.08	11.82	10.90	10.53
Soybean/Corn Ratio	ratio	2.46	2.70	2.18	2.01	2.06	2.69	2.82	2.62	2.50	2.50	2.66	2.50	2.50



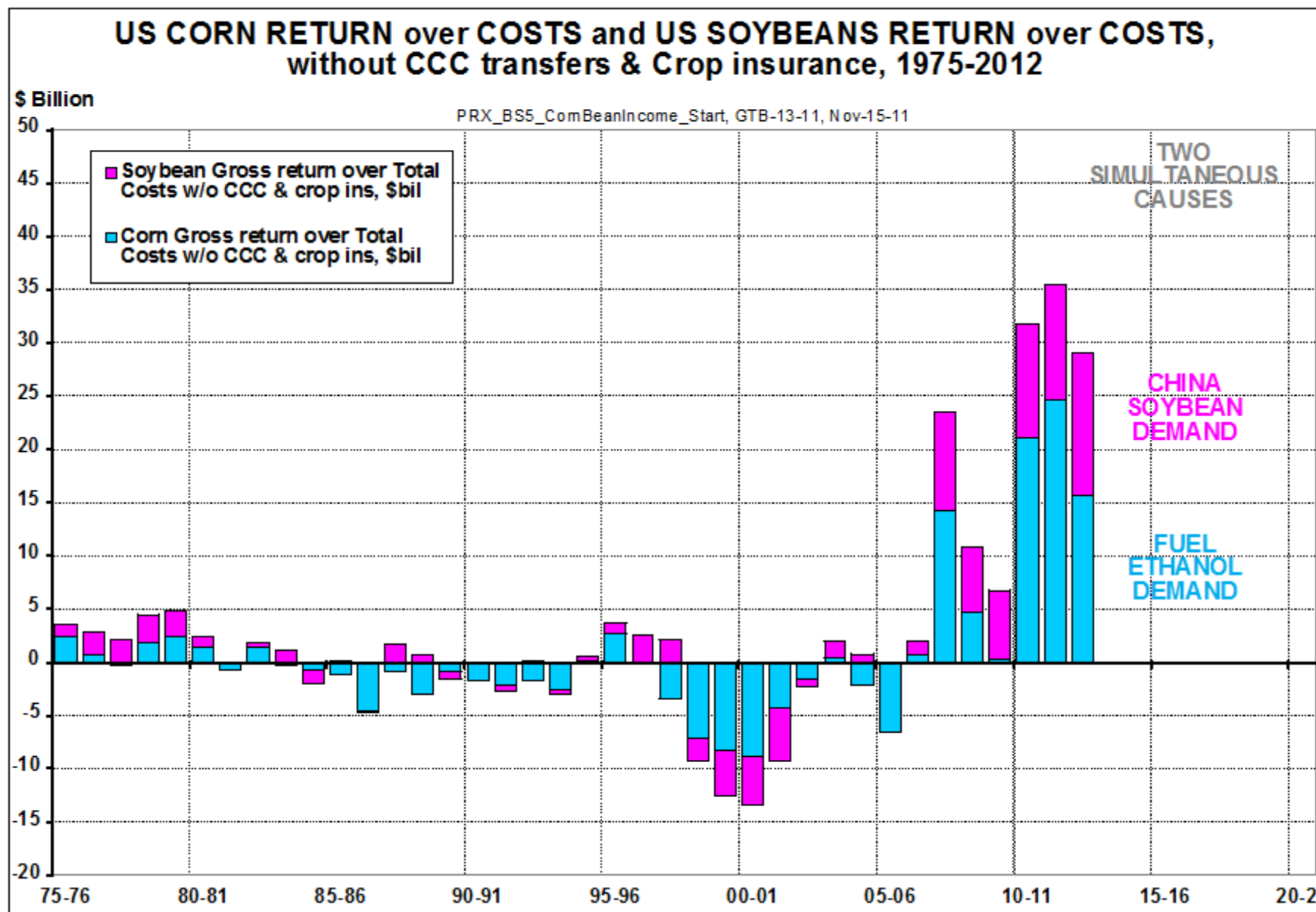


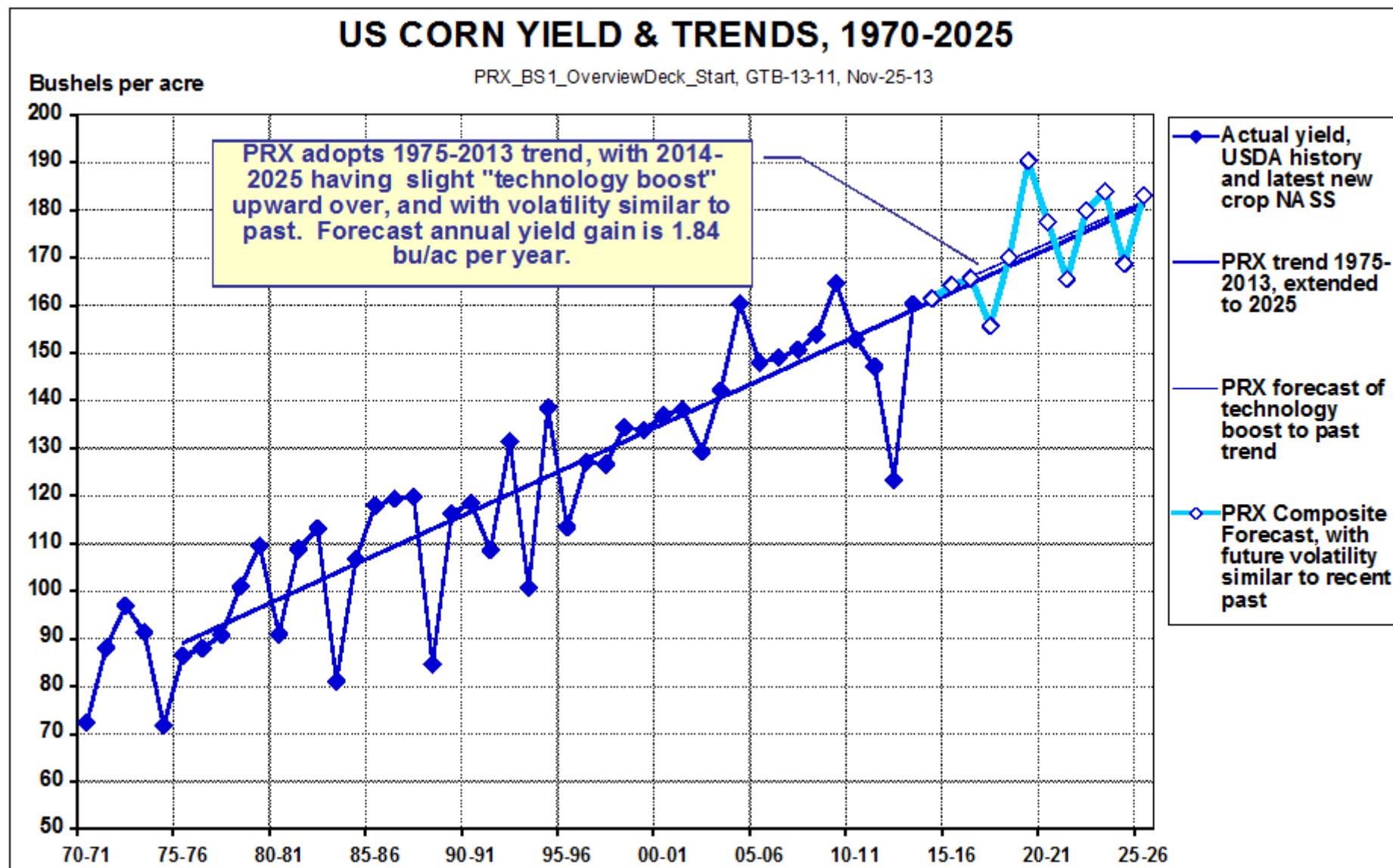






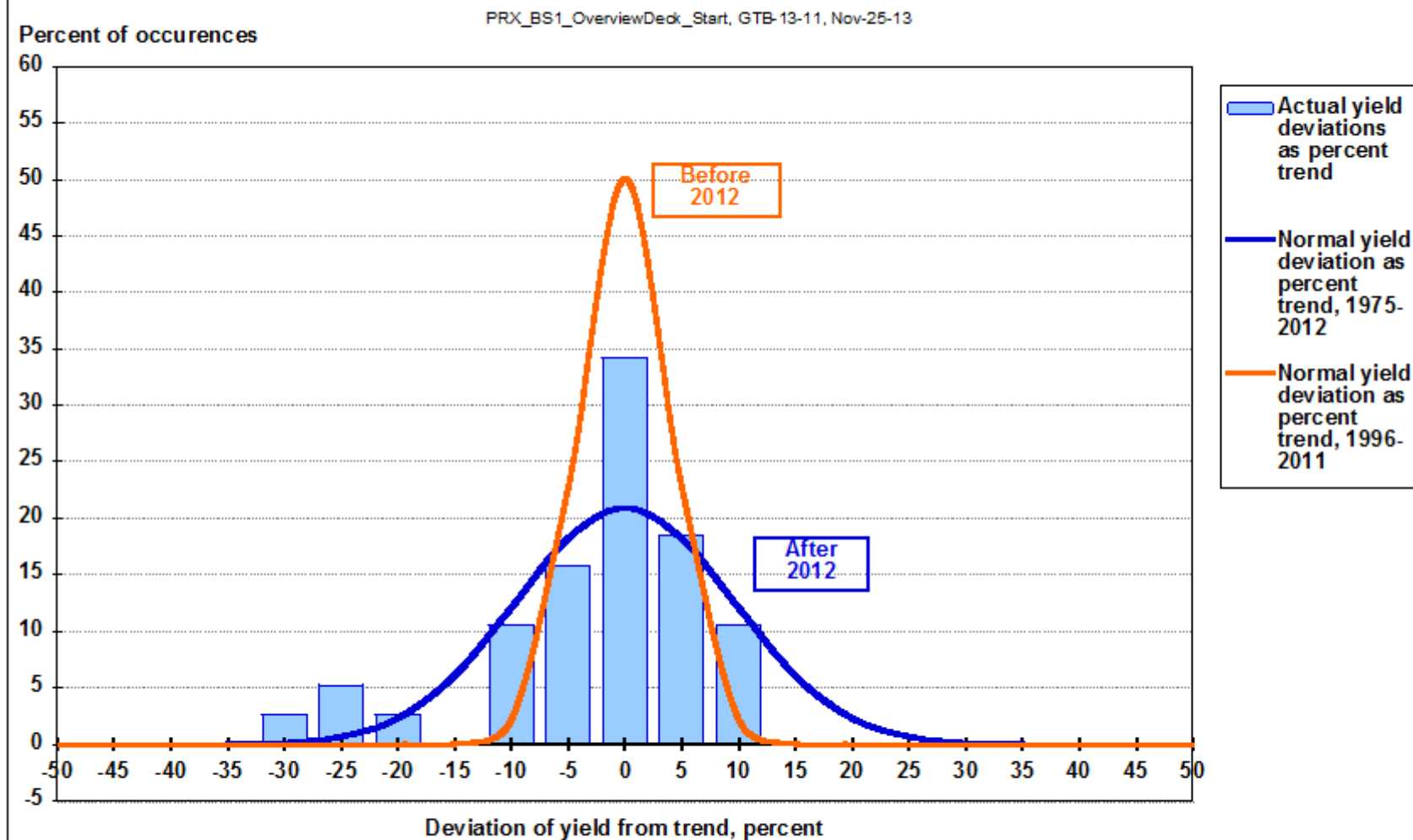
## "WEALTH BUILD" IN CORNBELT SINCE ENERGY ACT OF 2005 DUE 40% TO SOYBEANS!







## UNITED STATES CORN YIELD DEVIATION FROM TREND vs. "NORMAL" PROBABILITY CURVE



### CHOICE OF TREND = NEW ODDS FOR "NORMAL" YIELD EACH YEAR!

By departing from the recent period of "smooth sailing" in corn weather (1996-2009) back to the longer term, the odds decline from 50% for "normal" in any new crop year to only 20%!

## WORLD CORN EXPORTS BY MAJOR COUNTRIES

PRX\_FAS\_CornAnal\_GW, GTB-13-11, Nov-08-13

Crop Year (Jul-Jun)	Major Corn Exporters							All Others	World Total	Note: United States share
	South Africa	Argentina	Brazil	Former Soviet Union	Subtotal Competitors	United States	Sub-total			
	mmt	mmt	mmt	mmt	mmt	mmt	mmt	mmt	mmt	pct
93-94	4.2	4.1	0.0	0.0	8.3	33.7	42.1	16.8	58.9	57%
94-95	0.3	5.8	0.1	0.0	6.1	55.3	61.4	4.7	66.1	84%
95-96	2.7	7.5	0.3	0.1	10.5	56.6	67.1	3.3	70.4	80%
96-97	1.4	10.8	0.1	0.0	12.4	45.7	58.0	7.5	65.6	70%
97-98	1.2	12.2	0.0	0.6	14.1	38.2	52.3	11.0	63.3	60%
98-99	0.5	7.9	0.0	0.4	8.9	50.4	59.3	7.7	66.9	75%
99-00	1.4	11.9	0.2	0.1	13.7	49.2	62.9	12.9	75.8	65%
00-01	1.3	9.7	6.3	0.5	17.7	49.3	67.0	9.9	76.9	64%
01-02	1.1	10.9	2.1	0.4	14.4	48.4	62.7	11.9	74.7	65%
02-03	1.1	11.2	4.6	0.9	17.8	40.3	58.1	18.7	76.8	53%
03-04	0.7	10.9	4.4	1.3	17.4	48.3	65.7	11.6	77.3	62%
04-05	2.1	14.6	0.7	2.4	19.8	46.2	66.0	11.7	77.7	59%
05-06	0.5	9.5	4.5	2.6	17.1	54.2	71.3	9.8	81.1	67%
06-07	0.5	15.3	10.8	1.1	27.7	54.0	81.7	12.3	94.1	57%
07-08	2.2	14.8	7.8	2.1	26.9	61.9	88.8	9.8	98.6	63%
08-09	1.7	10.3	7.1	6.9	26.0	47.0	73.0	11.5	84.5	56%
09-10	2.1	16.5	11.6	5.6	35.7	50.3	86.0	10.6	96.6	52%
10-11	2.4	16.3	8.4	5.2	32.4	46.5	78.9	12.4	91.3	51%
11-12	1.8	17.1	24.3	17.5	60.8	39.2	100.0	17.0	117.0	33%
12-13	1.9	19.0	22.0	15.0	57.9	18.6	76.5	15.0	91.5	20%
13-14	2.0	18.0	20.0	20.8	60.8	35.6	96.4	14.0	110.4	32%
<b>Change versus previous year</b>										
	0.1	-1.0	-2.0	5.9	3.0	17.0	19.9	-1.0	18.9	

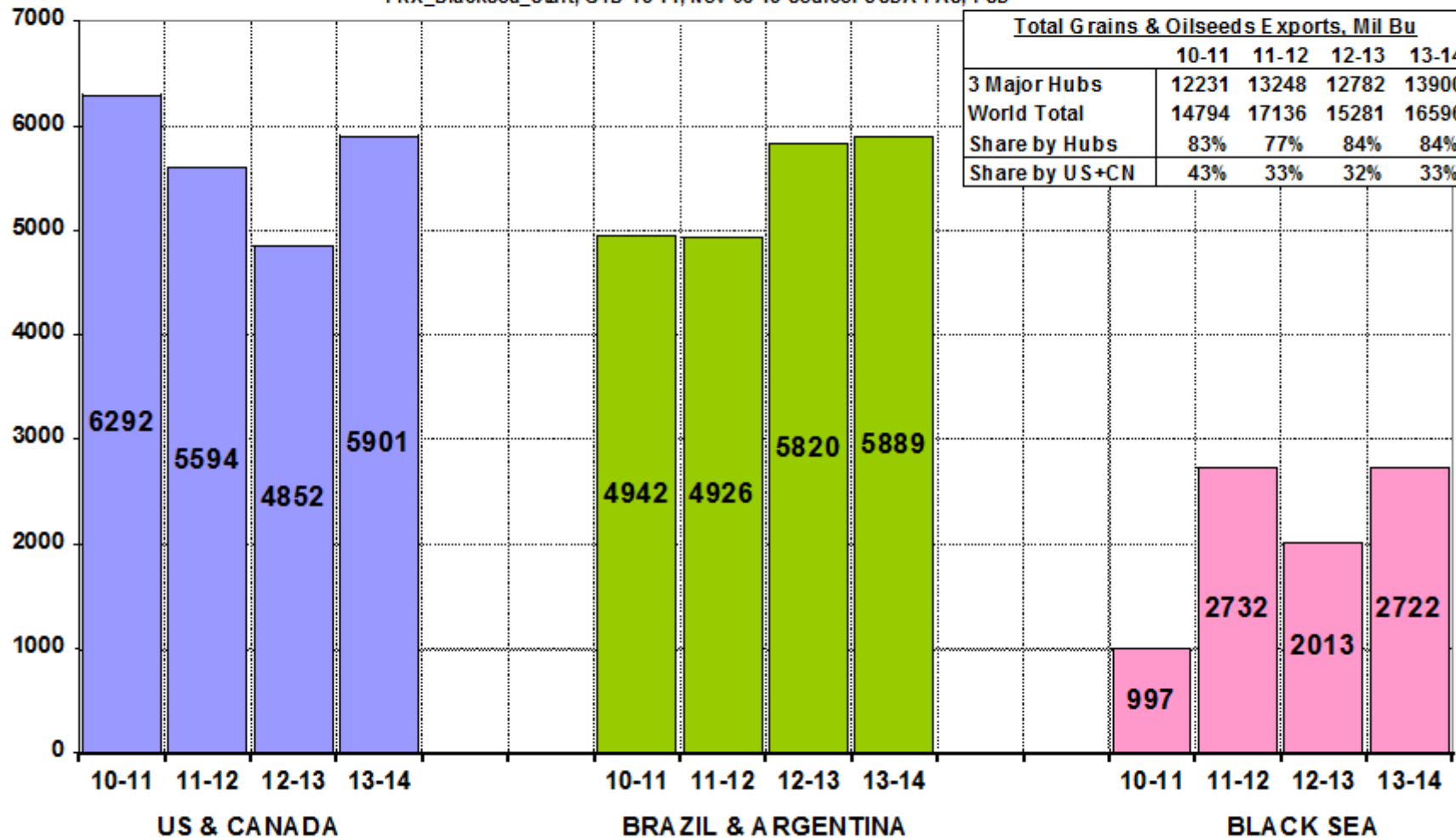
US share of world corn trade volume remains its lowest since early 1970s, suffering gains by Argentina, Brazil, and Former Soviet Union (Black Sea Region).

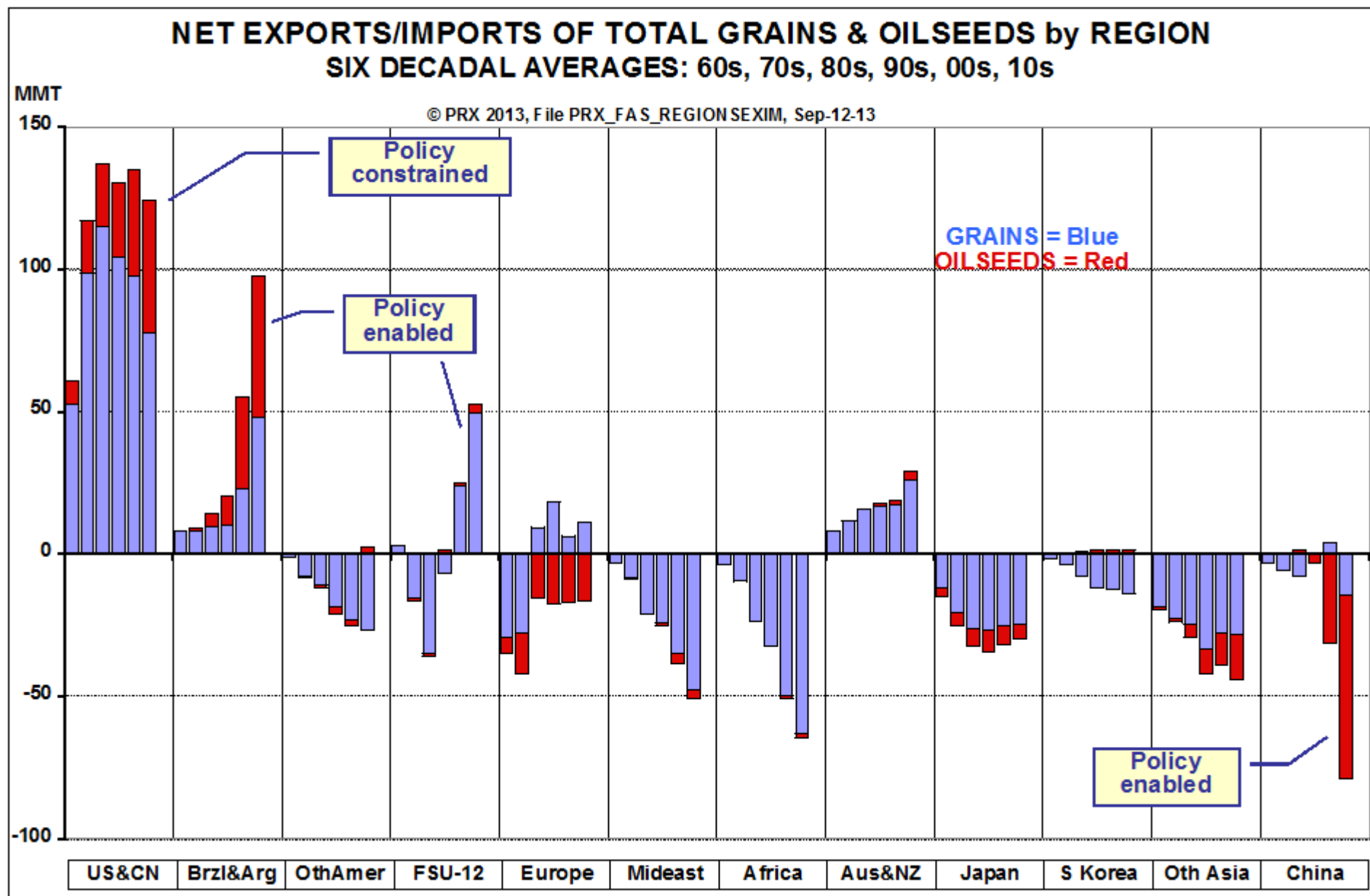
## NET EXPORTS FOR THREE MAJOR HUBS, MOST RECENT FOUR YEARS

### Total Grains & Oilseeds

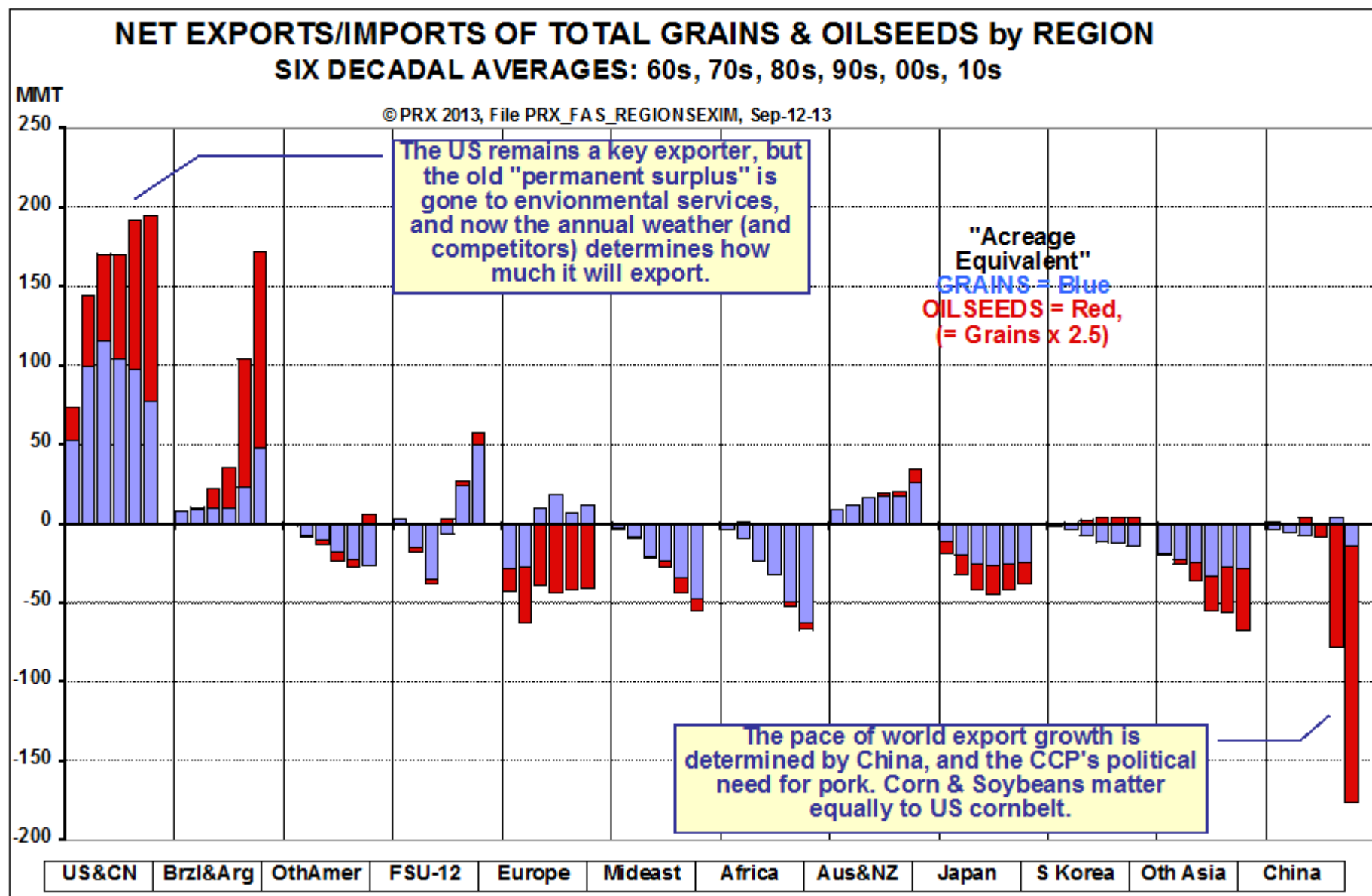
Million Bushels

PRX\_BlackSea\_Start, GTB-13-11, Nov-08-13 Source: USDA-FAS, PSD

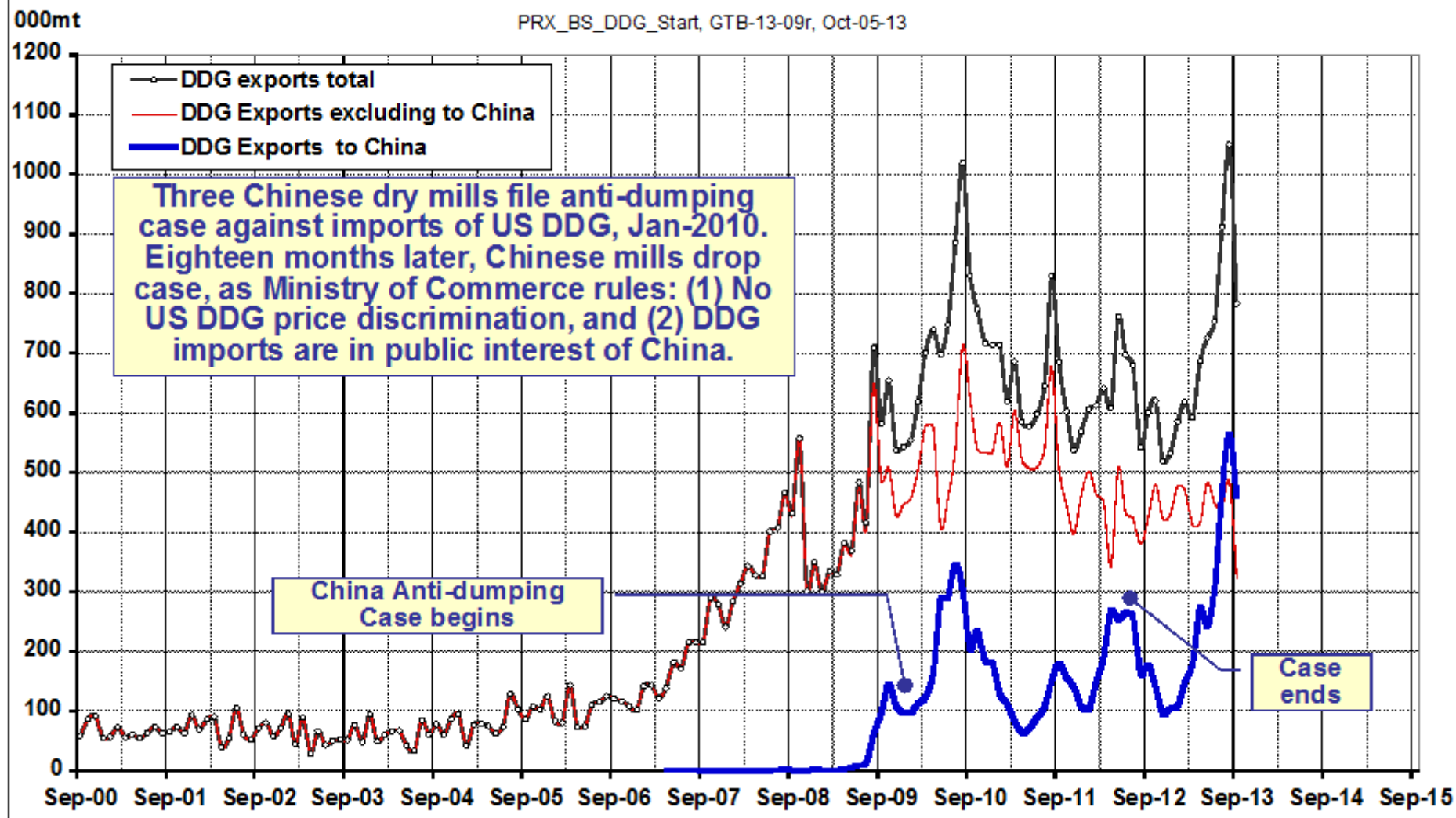


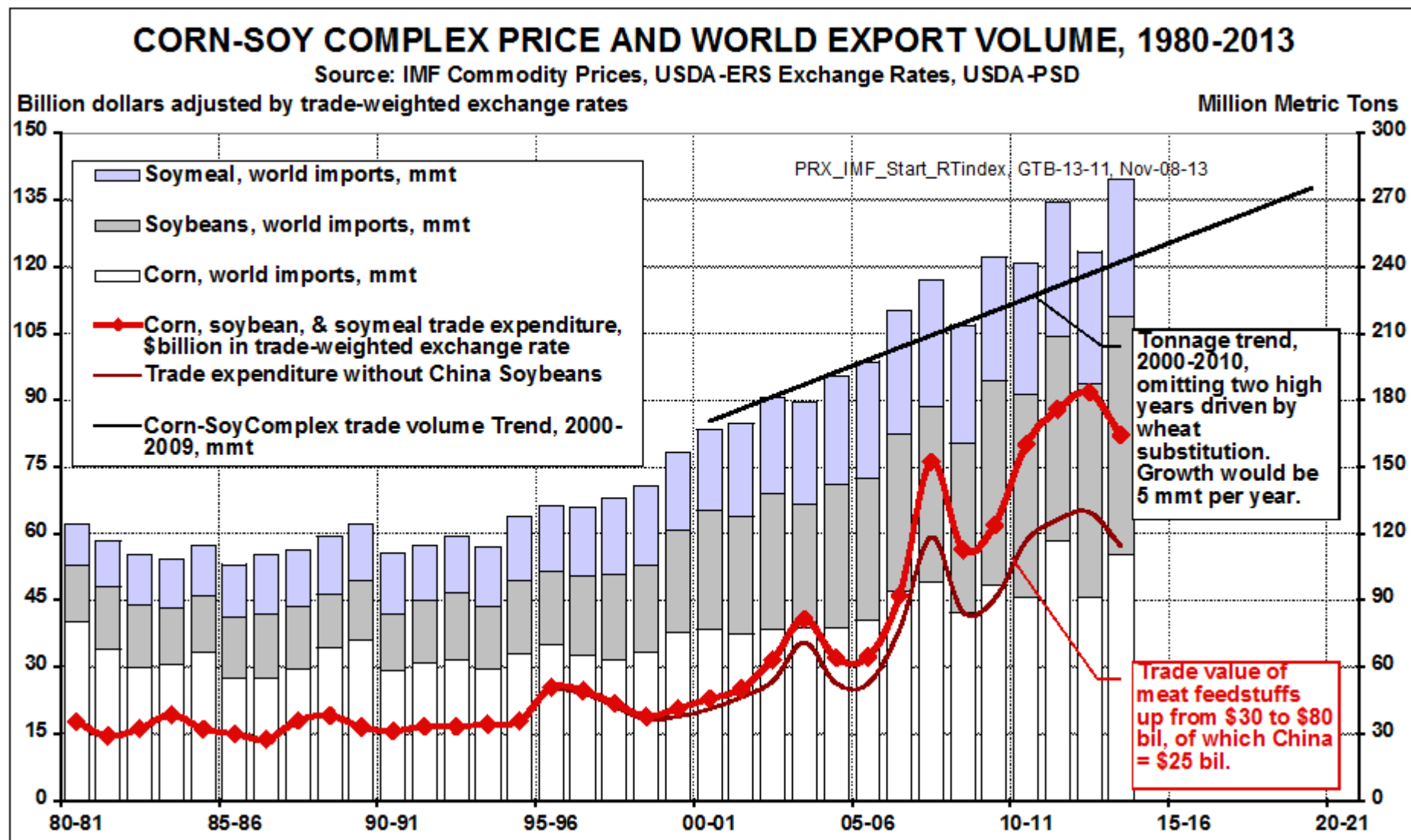


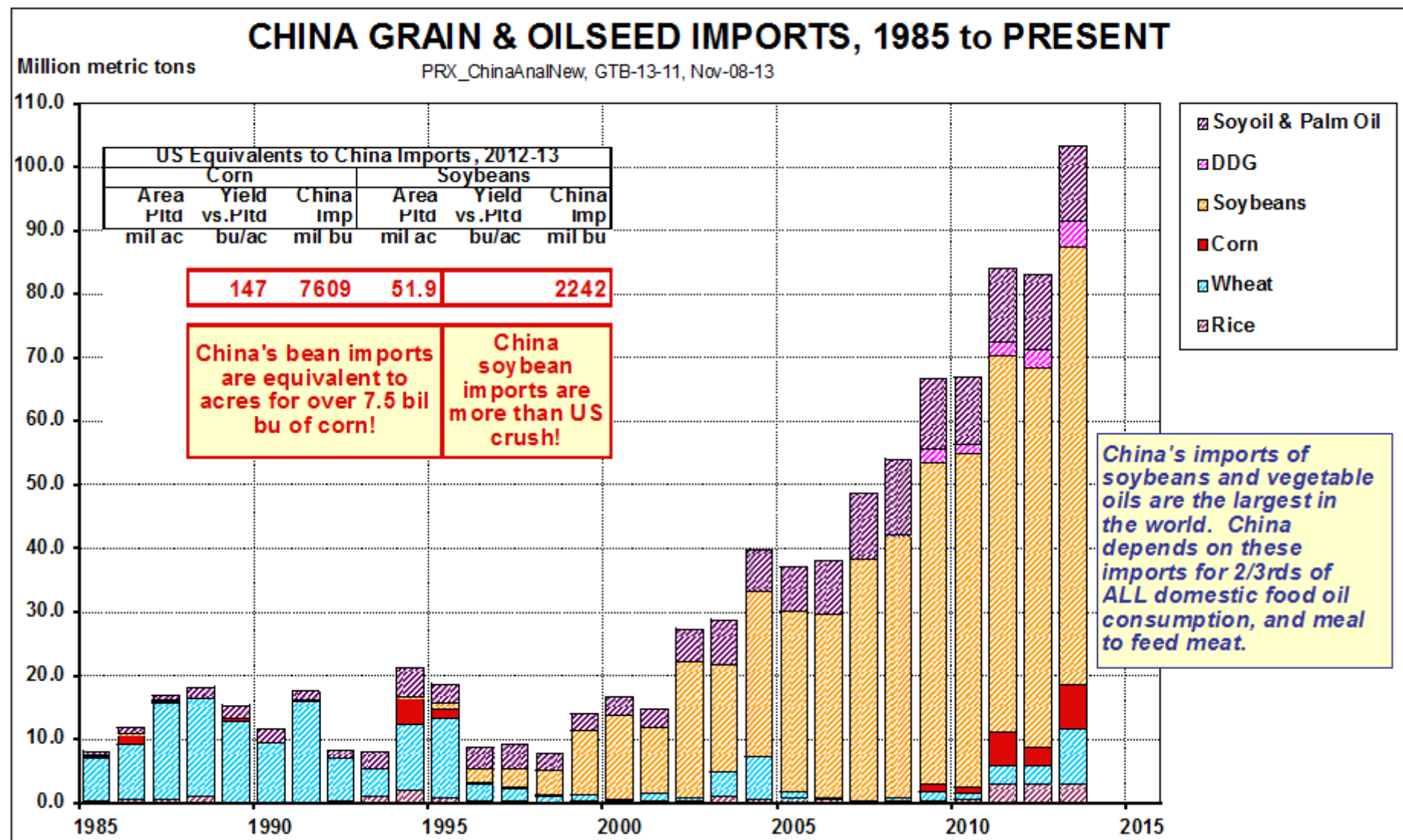




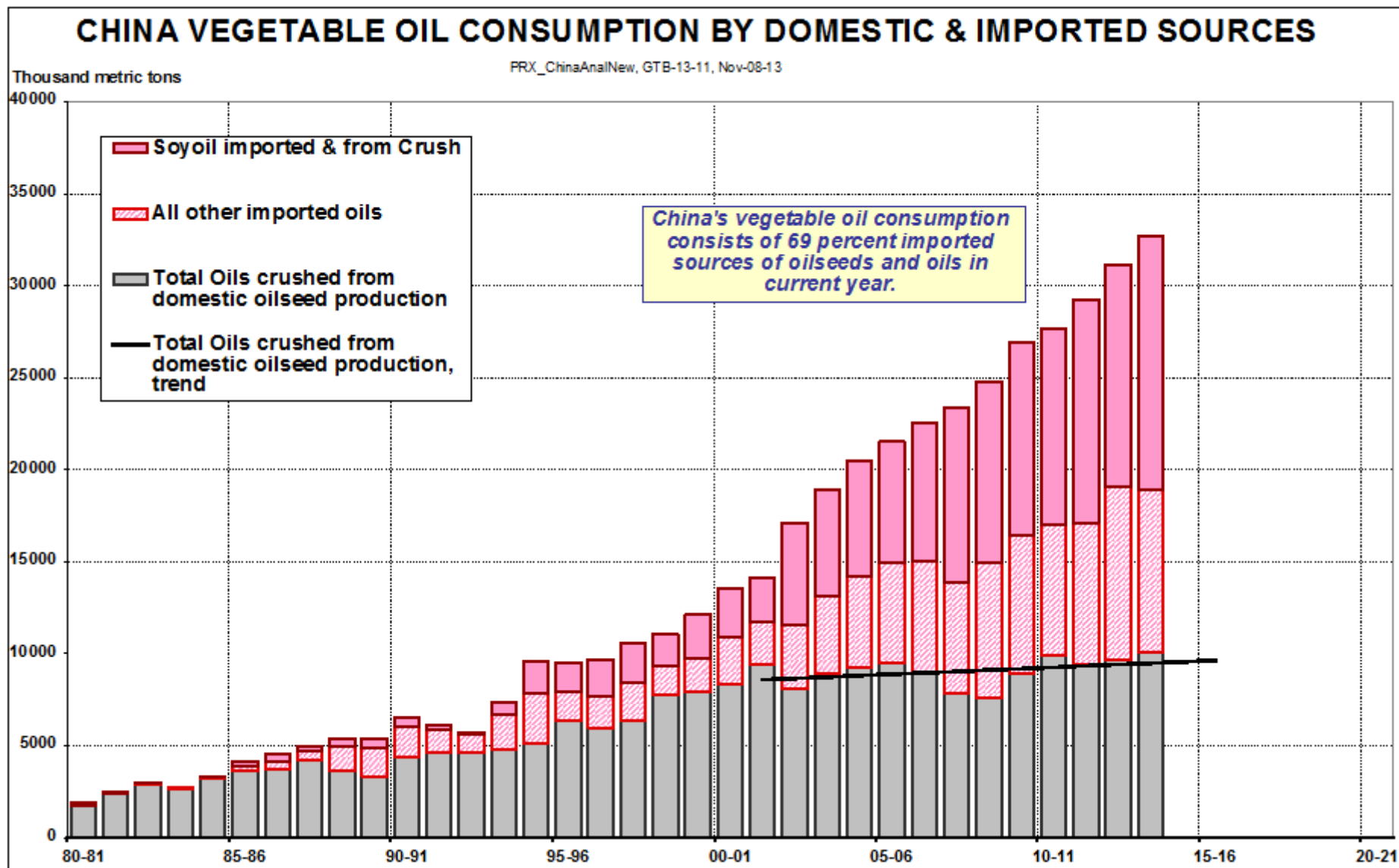
## US DDG EXPORTS, 2000-CURRENT, Monthly

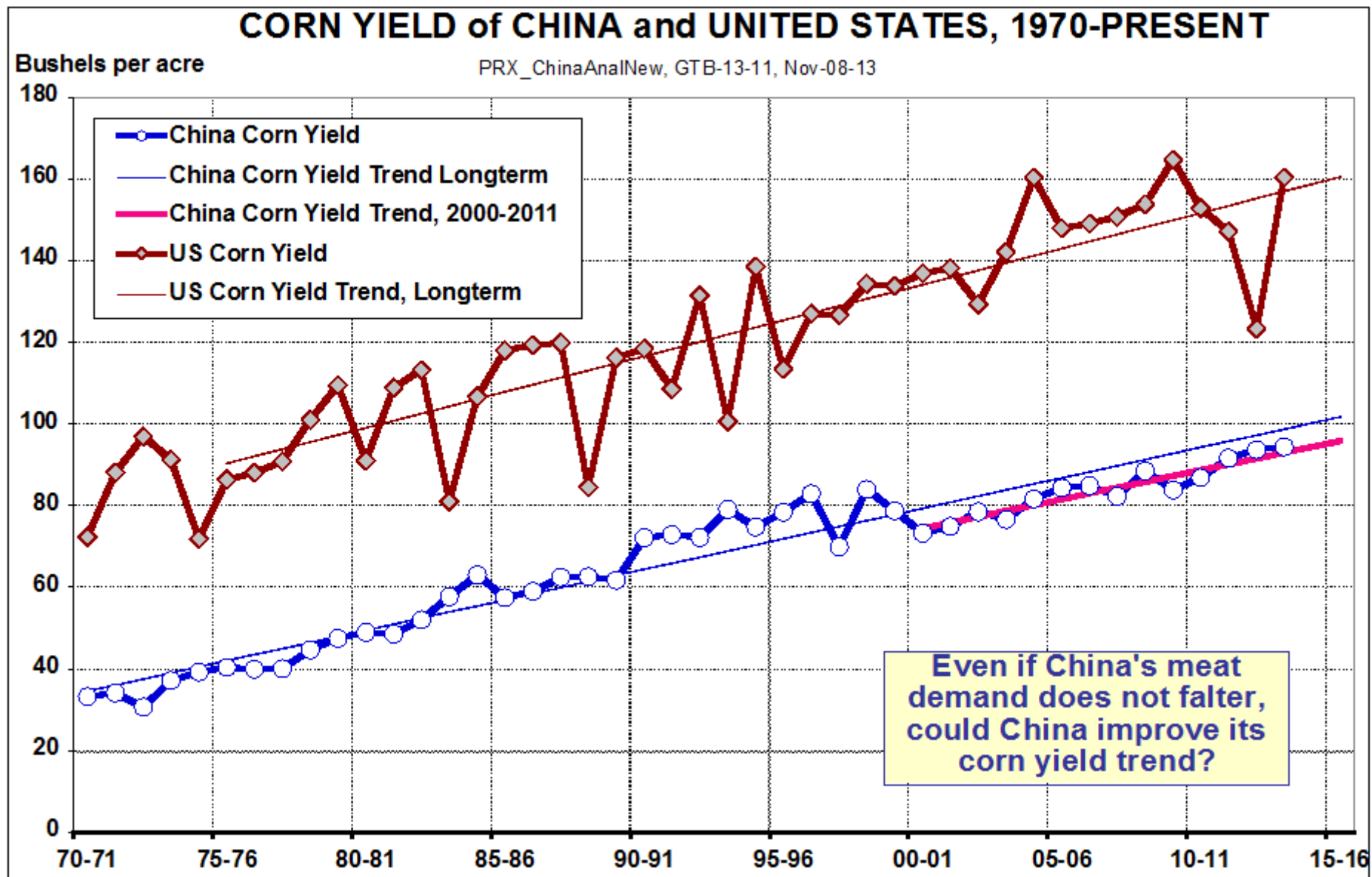












## CHINA MEAT PRODUCTION VS. CORN & SOYBEAN IMPORT DEMAND

PRX\_ChinaAnalNew, GTB-13-11, Nov-08-13. Source of data = USDA-FAS-PSD, Forecasts by PRX

Cal Year of Prdn	Meat Production				China Corn				China Soybeans					
	Beef	Pork	Poultry	Total Meat	Dmstc Prdn	Im- ports	Feed use	Fed per mt meat	Dmstc Prdn	Im- ports	Crush	Meal use	Beans Fed per mt meat	Olstds Fed per mt meat
	mmt	mmt	mmt	mmt	mmt	mmt	mmt	mt	mmt	mmt	mmt	mmt	mt	mt
2000	5.1	39.7	9.3	54.1	106.0	0.1	92.0	1.70	15.4	13.2	18.9	15.1	0.35	0.84
2001	5.1	40.5	9.3	54.9	114.1	0.0	94.0	1.71	15.4	10.4	20.3	16.2	0.37	0.85
2002	5.2	41.2	9.6	56.0	121.3	0.0	96.0	1.71	16.5	21.4	26.5	21.2	0.47	0.94
2003	5.4	42.4	9.9	57.7	115.8	0.0	97.0	1.68	15.4	16.9	25.4	20.4	0.44	0.90
2004	5.6	43.4	10.0	59.0	130.3	0.0	98.0	1.66	17.4	25.8	30.4	24.3	0.51	1.03
2005	5.7	45.6	10.2	61.4	139.4	0.1	101.0	1.64	16.4	28.3	34.5	27.6	0.56	1.07
2006	5.8	46.5	10.4	62.6	151.6	0.0	104.0	1.66	15.1	28.7	36.0	28.8	0.57	1.05
2007	6.1	42.9	11.3	60.3	152.3	0.0	106.0	1.76	13.4	37.8	39.5	31.6	0.66	1.14
2008	6.1	46.2	11.8	64.2	165.9	0.0	108.0	1.68	15.5	41.1	41.0	32.8	0.64	1.13
2009	5.8	48.9	12.1	66.8	164.0	1.3	118.0	1.77	15.0	50.3	48.8	39.1	0.73	1.22
2010	5.6	51.1	12.6	69.2	177.2	1.0	128.0	1.85	15.1	52.3	55.0	44.0	0.79	1.26
2011	5.6	49.5	13.2	68.3	192.8	5.2	131.0	1.92	14.5	59.2	61.0	48.8	0.89	1.40
2012	5.5	51.6	13.7	70.9	205.6	2.7	144.0	2.03	12.8	59.9	65.0	52.0	0.92	1.43
2013	5.6	53.8	13.5	72.9	211.0	7.0	156.0	2.14	12.2	69.0	68.4	54.7	0.94	1.43
<b>Annual Growth of Imports Implied at Current Meat Growth Trend</b>														
				1.4		2.8		1.97		1.4			0.94	
<b>Annual Growth of Imports Implied (2013-2020) at Likely Future Meat Growth Trend (PRX)</b>														
				2.5		6.3		2.50		2.5			1.00	

**PRX Forecasts. (1) China corn imports to increase at 3 mmt/yr (the other 3 mmt/yr from China's increasing yield trend. (2) China soybean imports to increase at about 2 mmt/yr.**

