

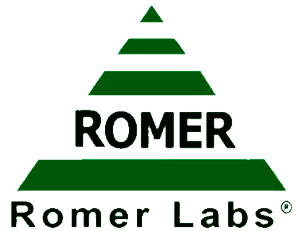
Mycotoxin Occurrence in 2020 US Corn & Corn By-products April 2021 Update

April 8, 2021

Mycotoxins & Analysis



LC-MS/MS



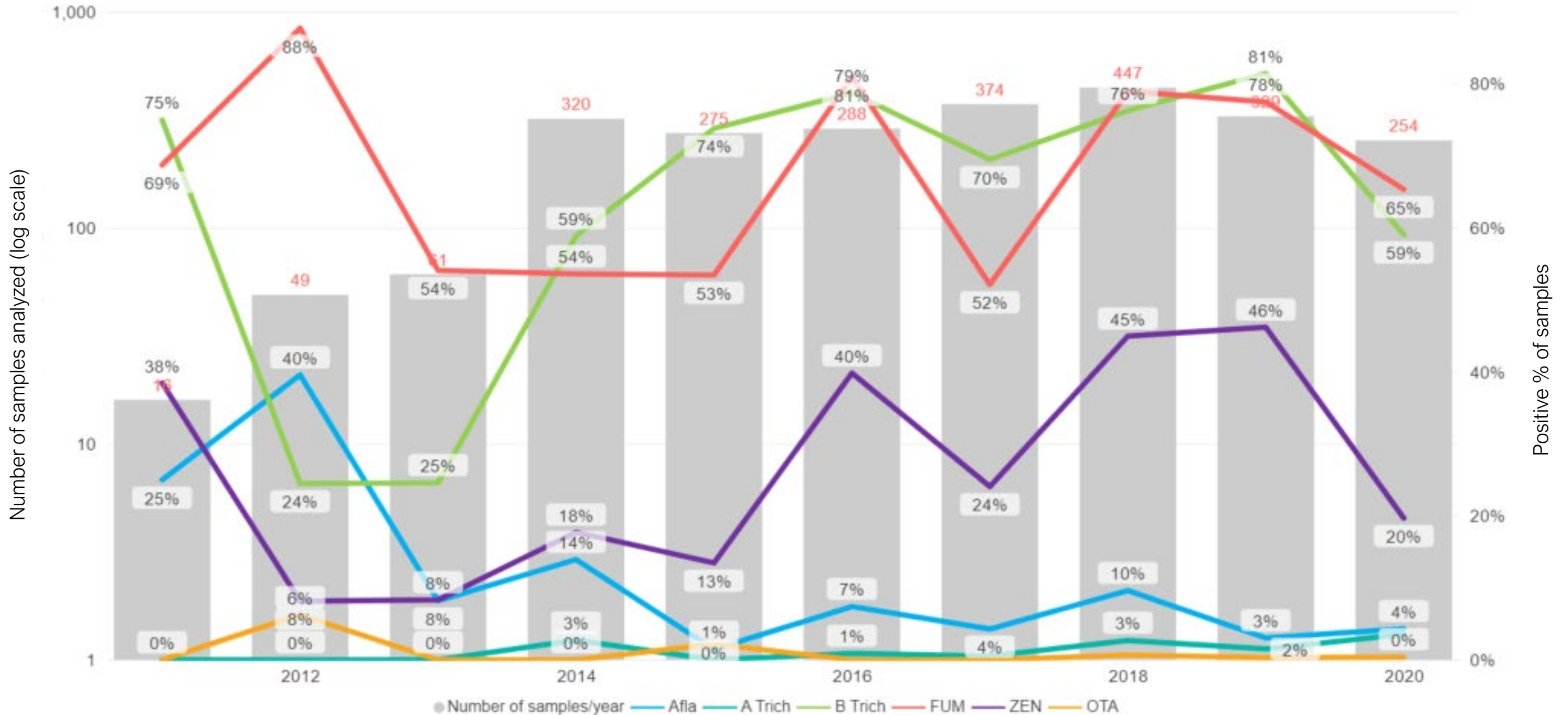
2 Labs

Mycotoxin Group	Mycotoxins	Limit of Detection (ppb)
Aflatoxins (AFLA)	Aflatoxin B1	1.3
	Aflatoxin B2	1.2
	Aflatoxin G1	1.1
	Aflatoxin G2	1.6
A-Trichothecenes (A-Trich)	T-2	100.0
	HT-2	100.0
	Neosolaniol	100.0
	Diacetoxyscirpenol (DAS)	100.0
B-Trichothecenes (B-Trich)	Deoxynivalenol (DON/Vomitoxin)	100.0
	Acetyl-deoxynivalenol (A-DON)	100.0
	Nivalenol (NIV)	100.0
	Fusarenon X (FUS-X)	100.0
Fumonisin (FUM)	Fumonisin B1	100.0
	Fumonisin B2	100.0
	Fumonisin B3	100.0
Zearalenone (ZEN)	Zearalenone (ZEN)	51.7
Ochratoxin A (OTA)	Ochratoxin A (OTA)	1.1

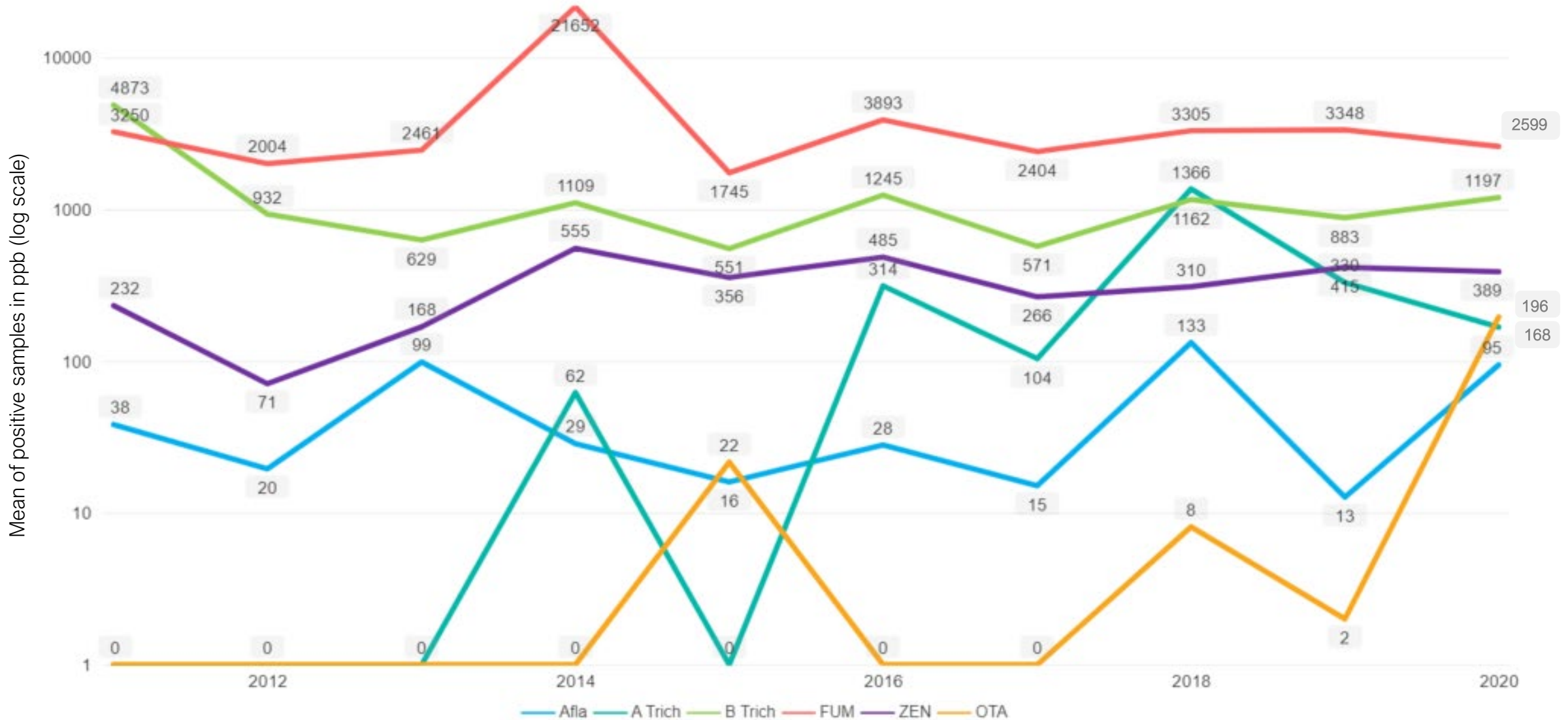


2020 US Corn (as-fed basis)

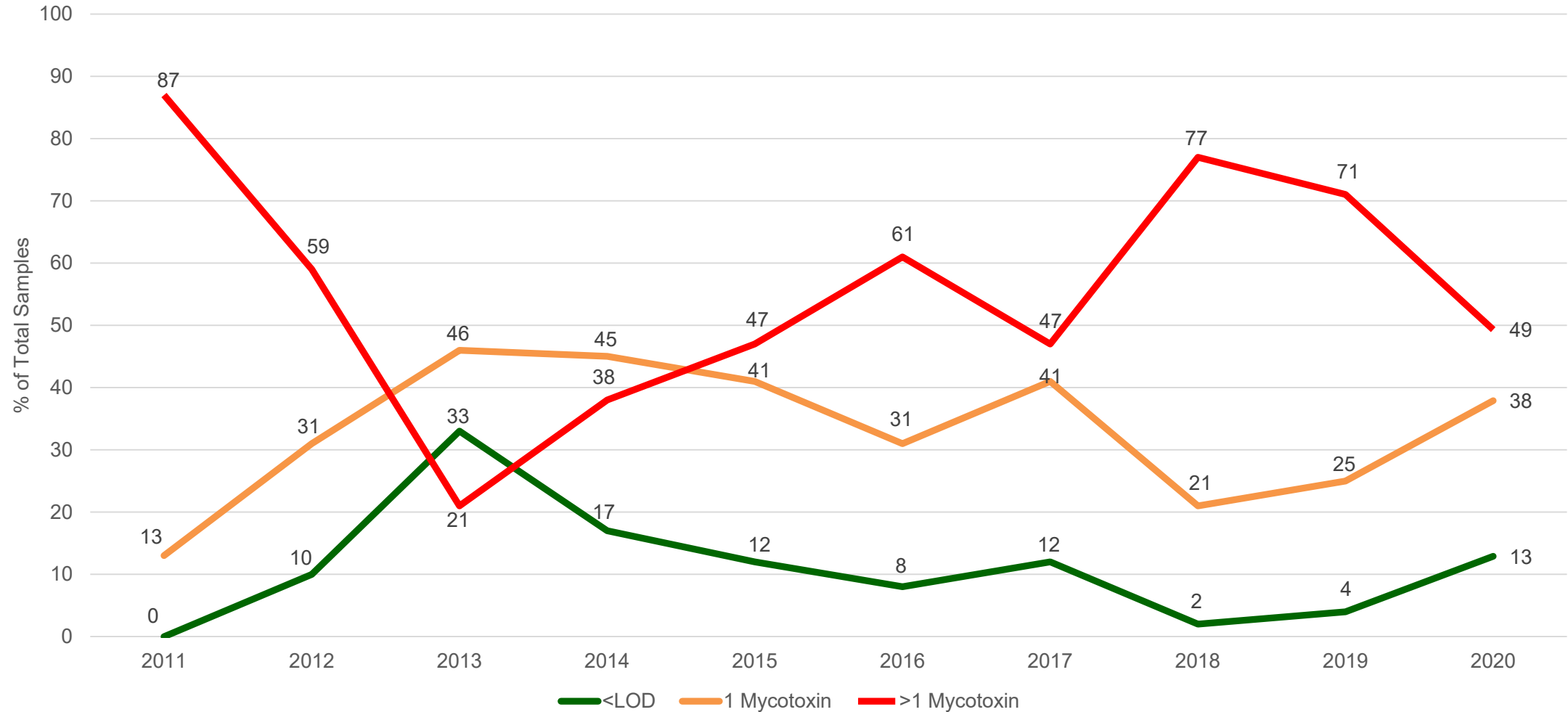
MTX Occurrence Trend in 2020 US Corn



Mean of Positives Trend in 2020 US Corn



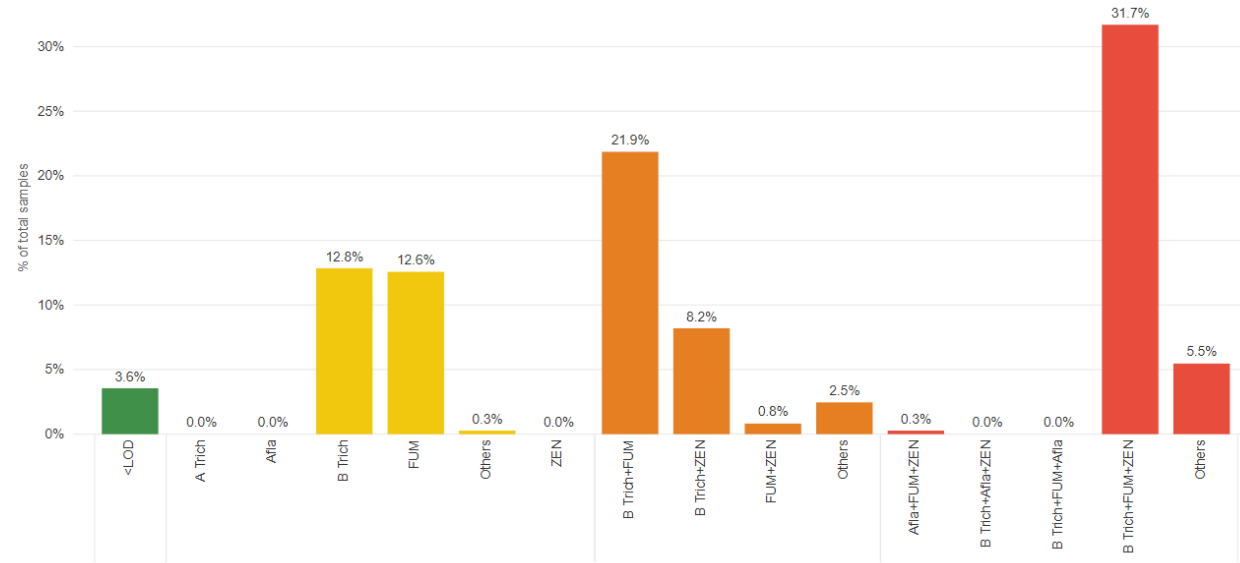
Mycotoxin Co-occurrence Trend in 2020 US Corn



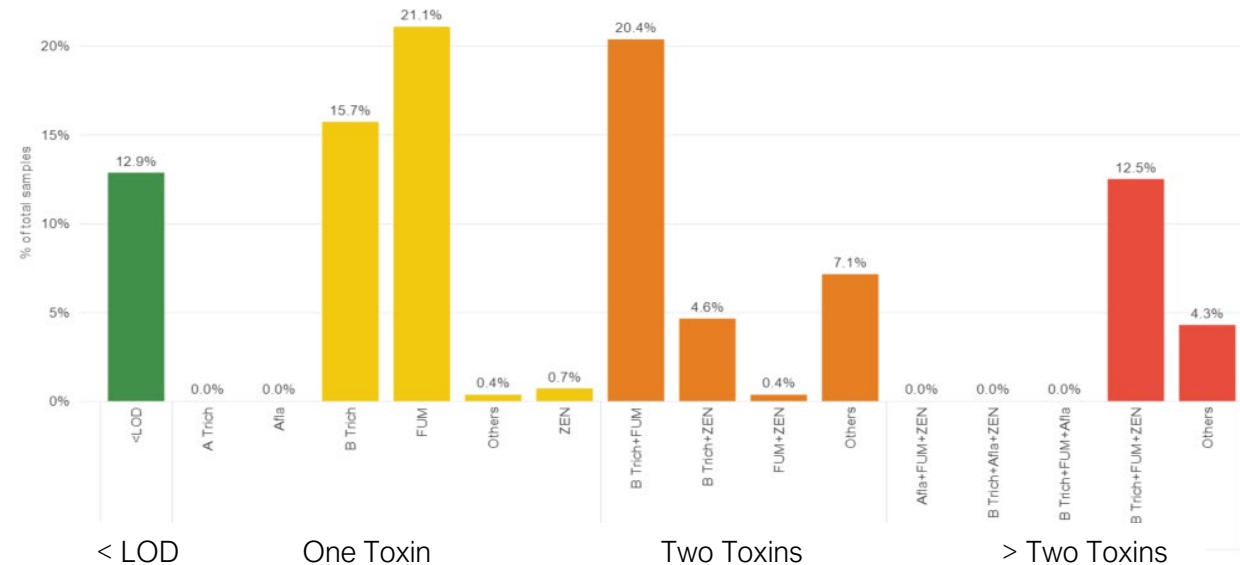
Mycotoxin Co-occurrence 2019 vs. 2020 in US Corn



2019



2020



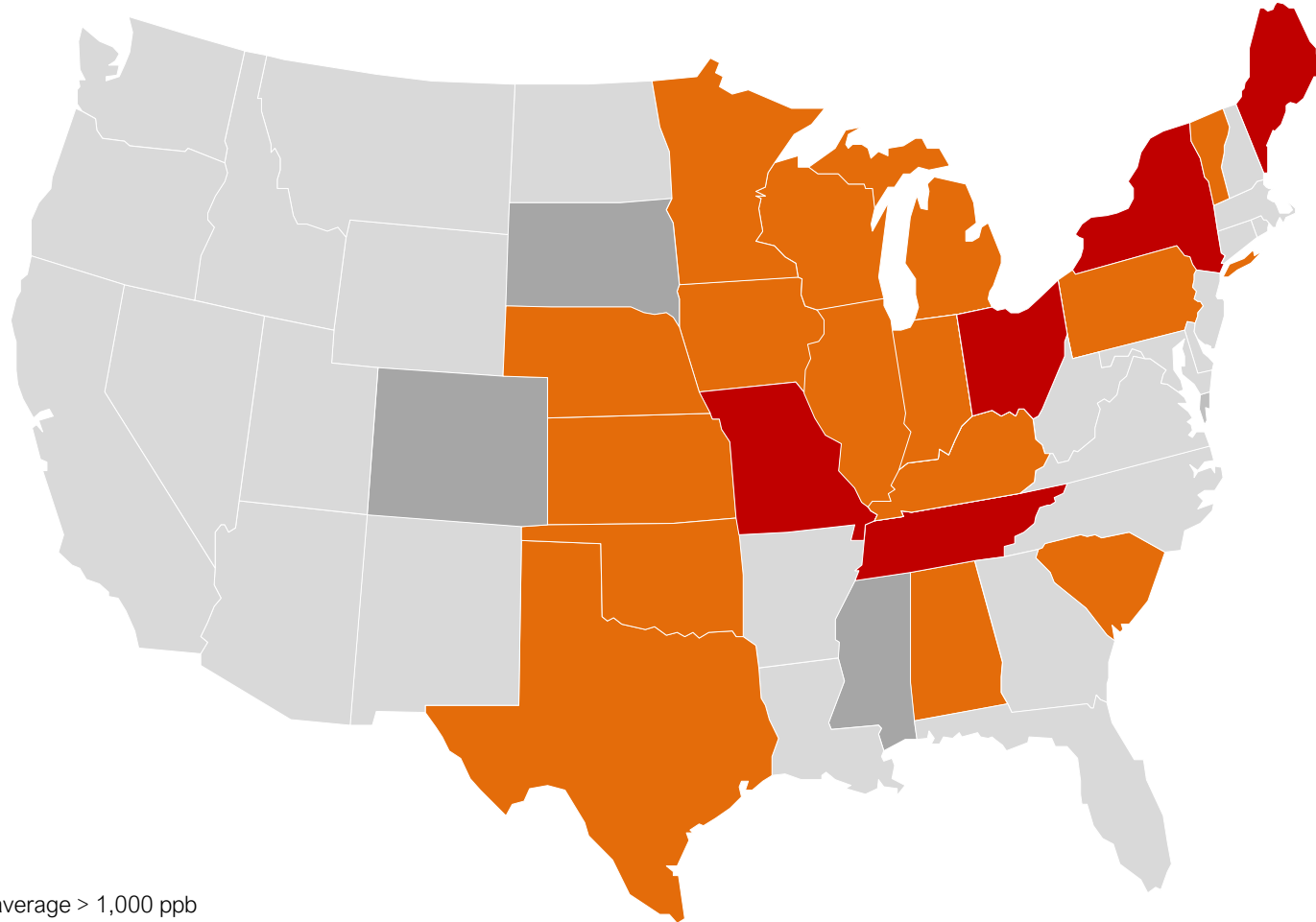
< LOD

One Toxin

Two Toxins

> Two Toxins

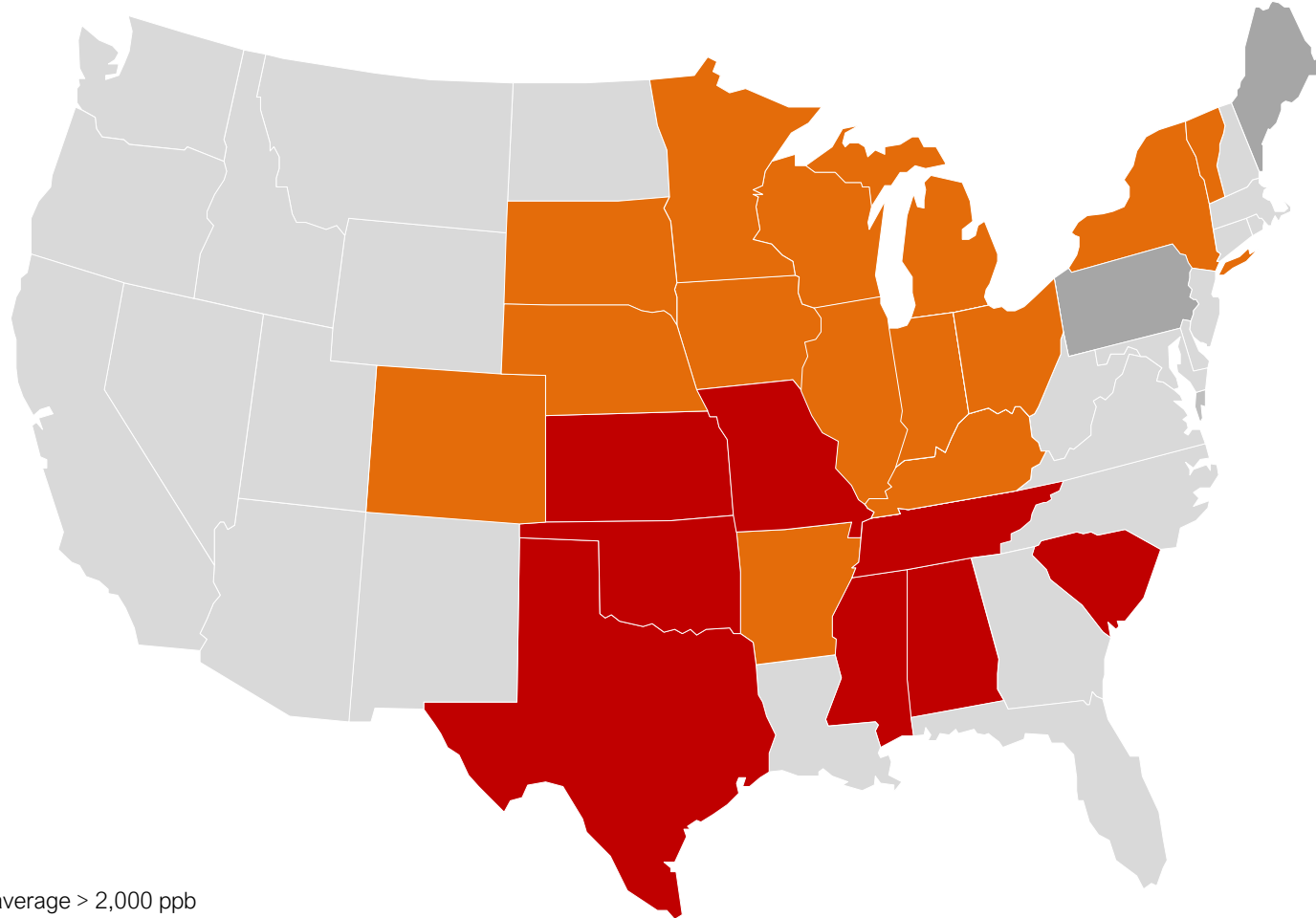
2020 Corn Risk by State - B Trich



- State with average > 1,000 ppb
- State with average < 1,000 ppb
- State with samples < LOD (100 ppb)
- No sample submitted

State	Number of Samples	% Positive Samples	Avg of Positive Samples
OH	6	100%	12522
ME	1	100%	2864
MO	24	58%	1141
NY	3	100%	1030
TN	4	50%	1013
IL	21	95%	993
SC	6	50%	975
IN	13	92%	785
MI	11	64%	762
WI	31	94%	670
OK	7	43%	572
AL	6	17%	516
IA	31	23%	487
MN	26	50%	483
KY	5	100%	481
NE	33	55%	449
PA	1	100%	230
VT	2	100%	225
TX	6	17%	110
KS	8	25%	110
CO	7	0%	0
MS	1	0%	0
SD	1	0%	0

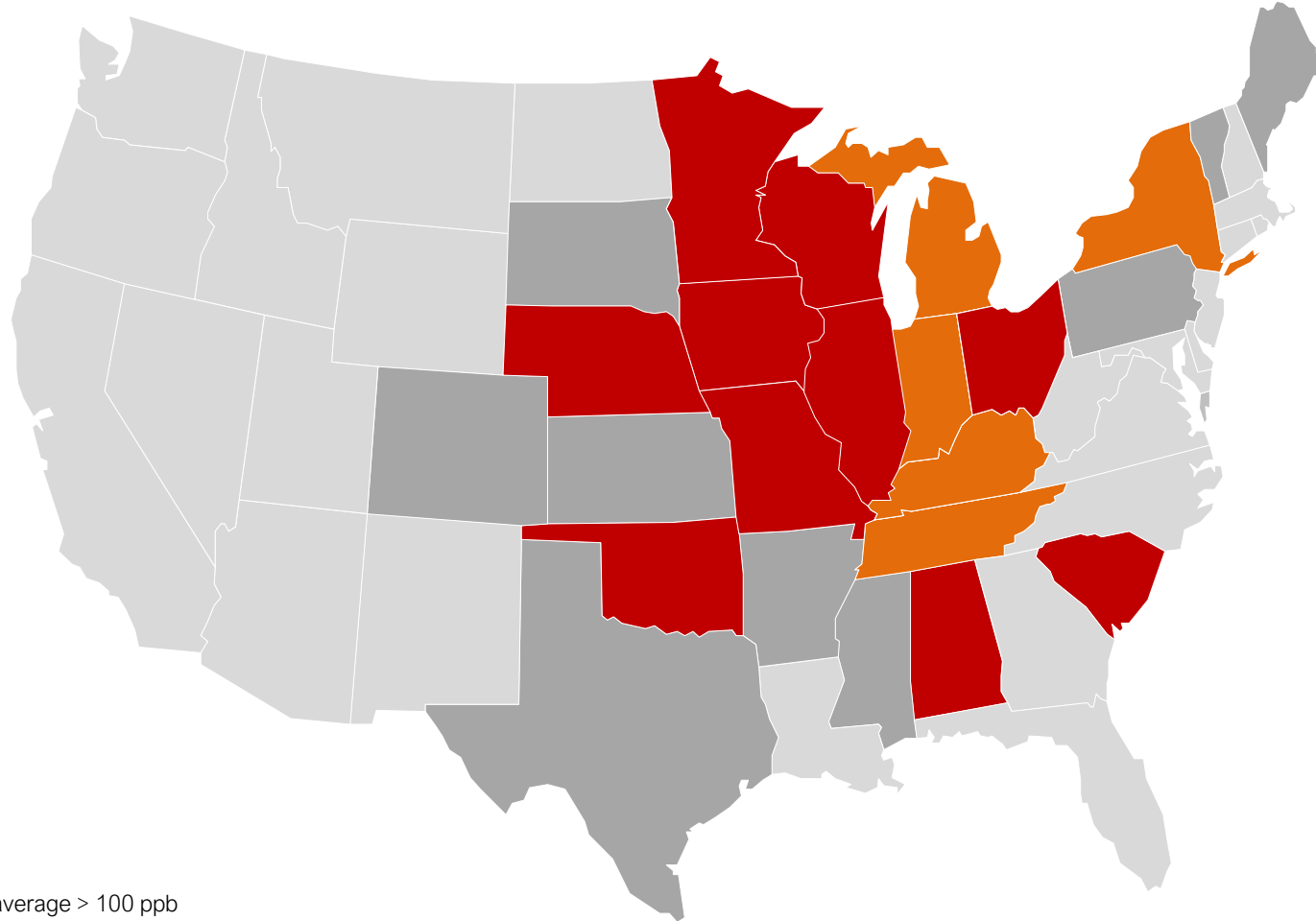
2020 Corn Risk by State - FUM



- State with average > 2,000 ppb
- State with average < 2,000 ppb
- State with samples < LOD (100 ppb)
- No sample submitted

State	Number of Samples	% Positive Samples	Avg of Positive Samples
KS	8	100%	12638
MS	1	100%	8200
MO	24	96%	7500
TX	6	100%	6533
OK	7	71%	2900
TN	4	100%	2200
SC	6	100%	2183
AL	6	100%	2033
KY	5	100%	928
NE	33	64%	813
MN	26	27%	807
CO	7	86%	800
VT	2	50%	700
WI	31	52%	585
OH	6	67%	504
NY	3	67%	500
IL	21	71%	480
IN	13	54%	443
MI	11	45%	280
IA	31	55%	276
SD	1	100%	200
ME	1	0%	0
PA	1	0%	0

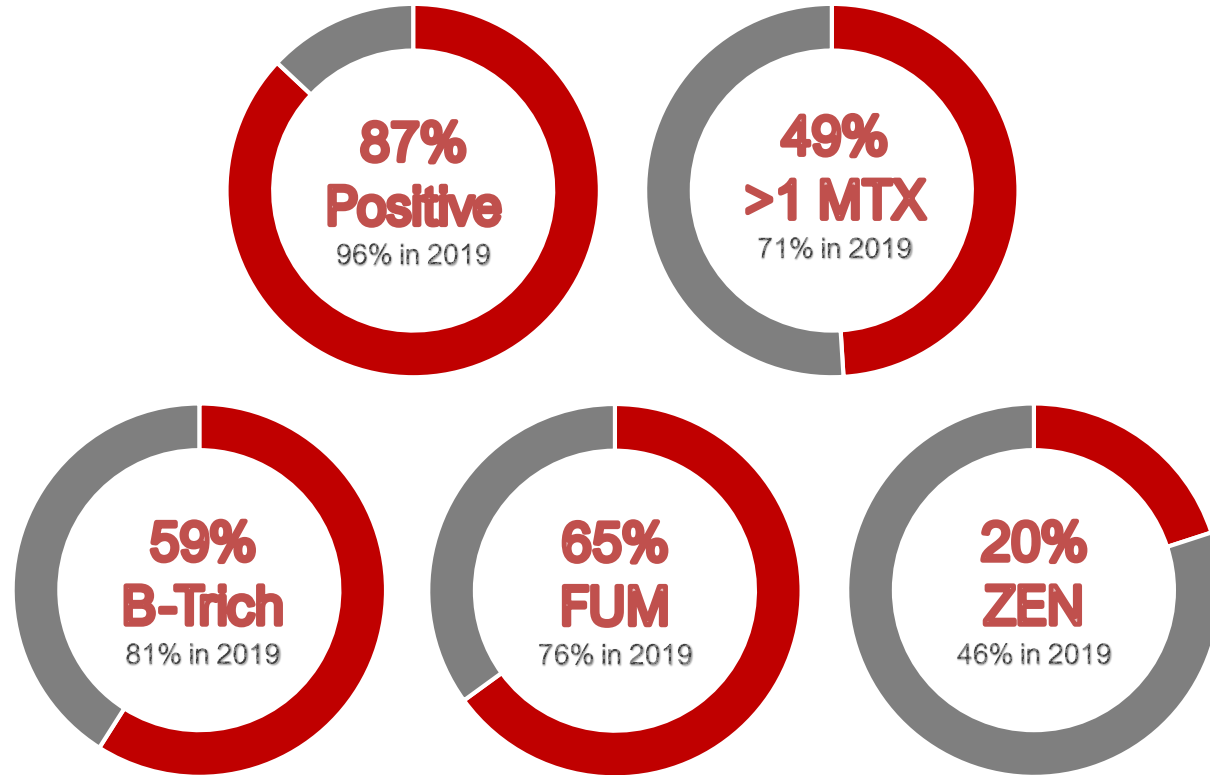
2020 Corn Risk by State - ZEN



- State with average > 100 ppb
- State with average < 100 ppb
- State with samples < LOD (51.7 ppb)
- No sample submitted

State	Number of Samples	% Positive Samples	Avg of Positive Samples
OH	6	100%	1135
SC	6	17%	891
MO	24	25%	496
WI	31	16%	408
IL	21	48%	338
NE	33	15%	289
MN	26	12%	209
OK	7	14%	118
AL	6	33%	112
IA	31	10%	108
TN	4	25%	86
IN	13	23%	82
NY	3	33%	65
MI	11	18%	65
KY	5	20%	64
CO	7	0%	0
KS	8	0%	0
ME	1	0%	0
MS	1	0%	0
PA	1	0%	0
SD	1	0%	0
TX	6	0%	0
VT	2	0%	0

Mycotoxin Survey Summary - 2020 US Corn



Forecasted risk for livestock production:

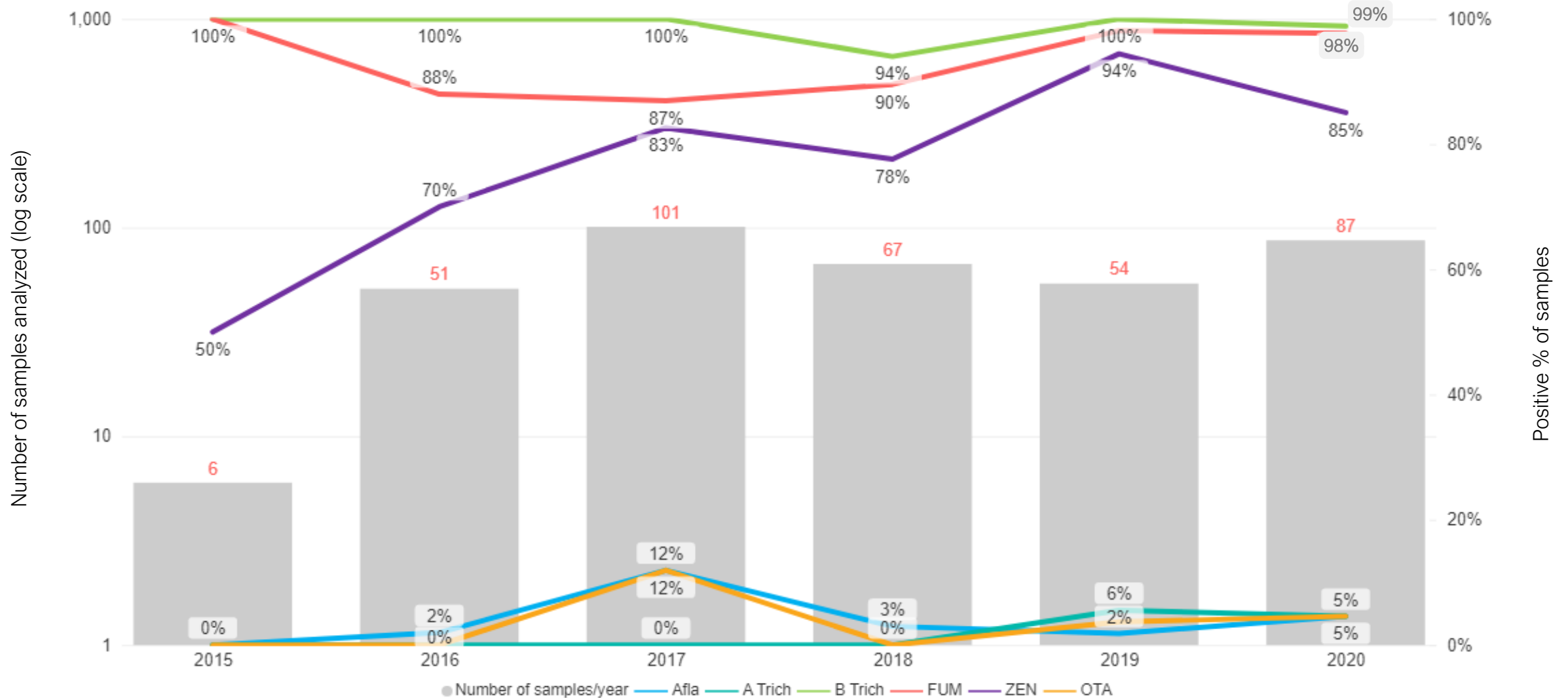
Severity of Mycotoxin Contamination



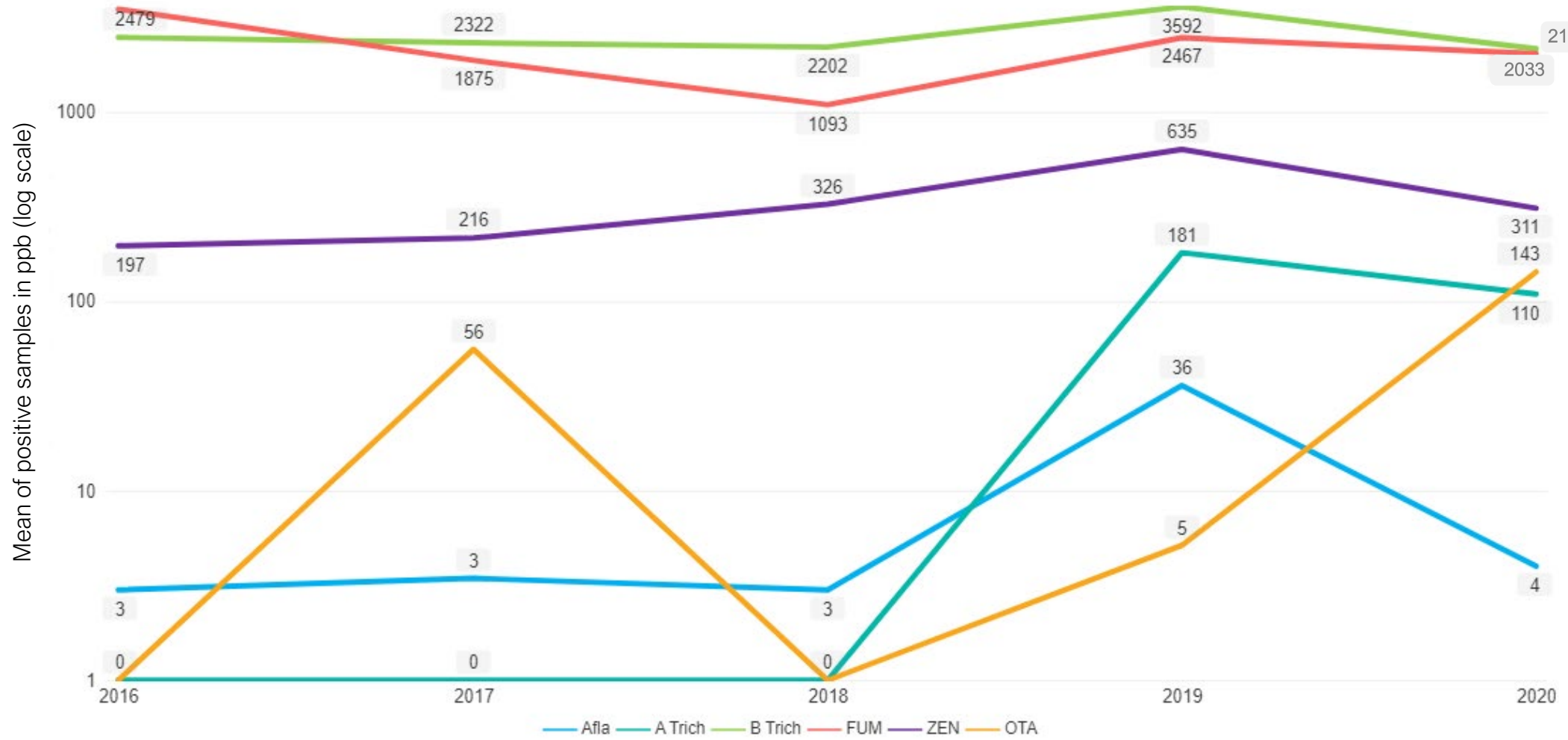


2020 US Corn By-products (as-fed basis)

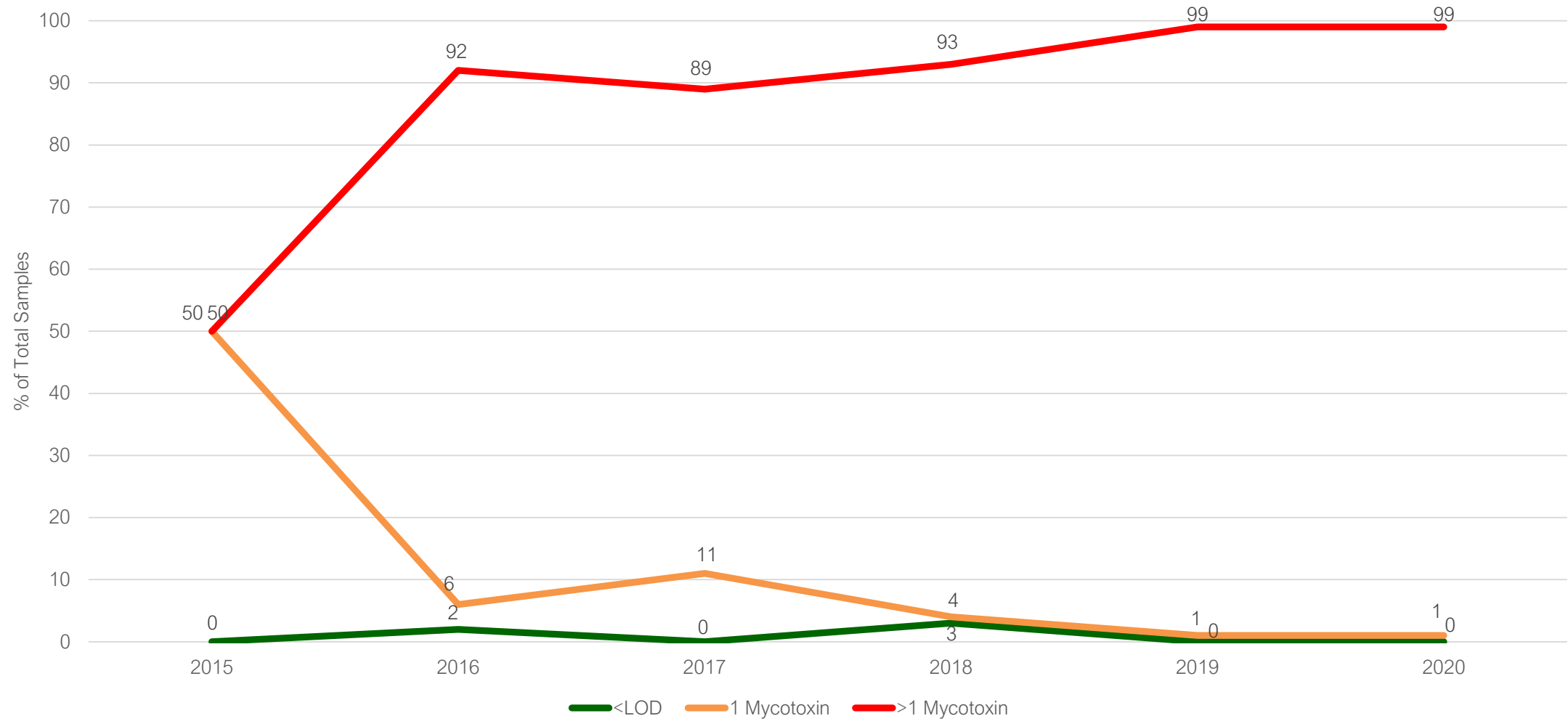
Occurrence Trend in USA



Mean of Positives Trend in USA



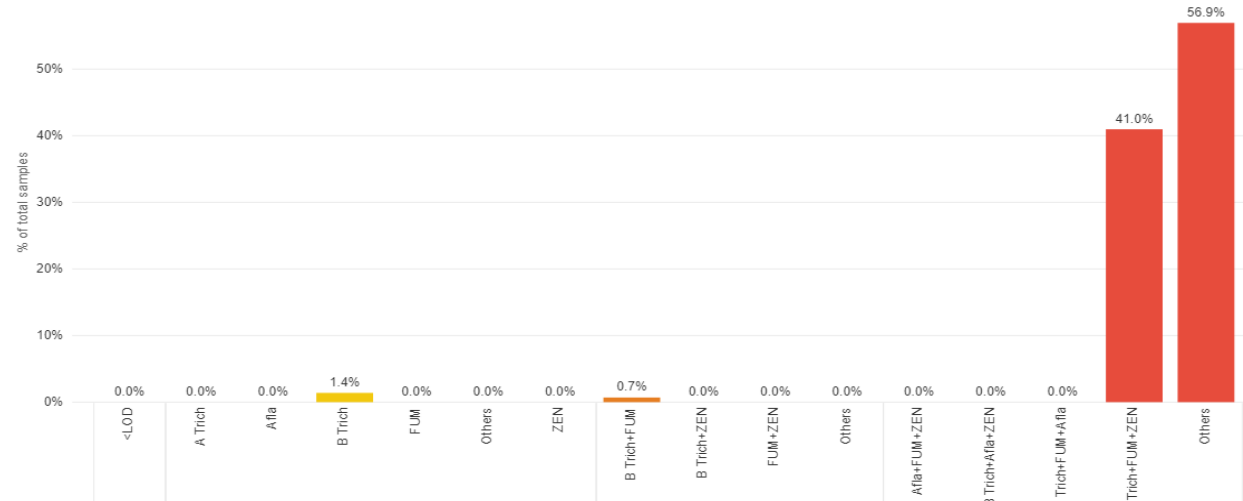
Co-occurrence Trend in USA



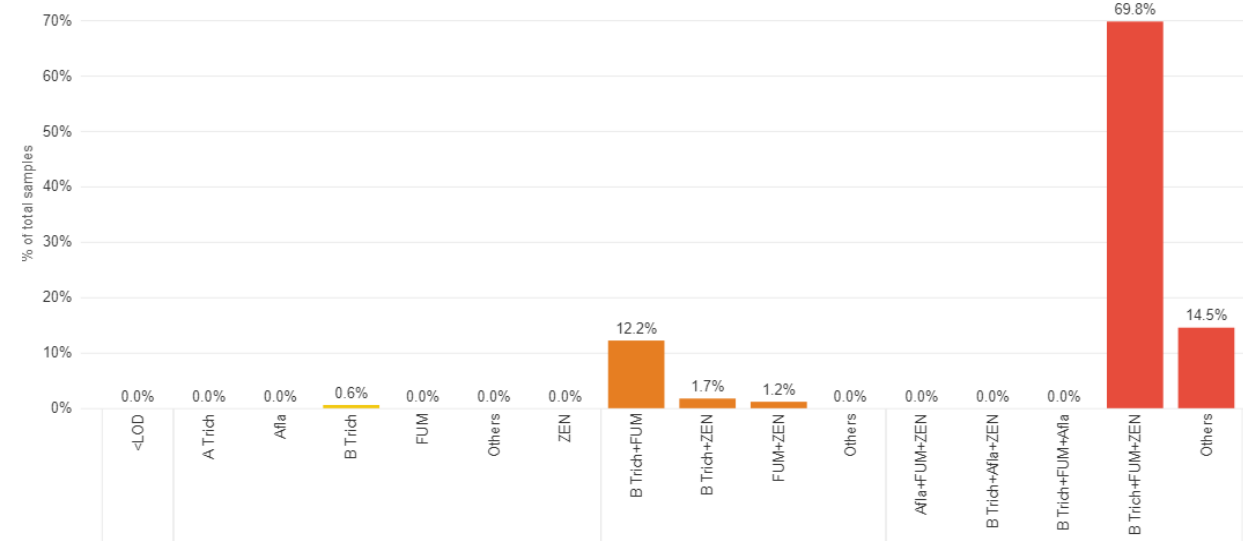
Co-occurrence 2019 vs. 2020 in USA



2019



2020

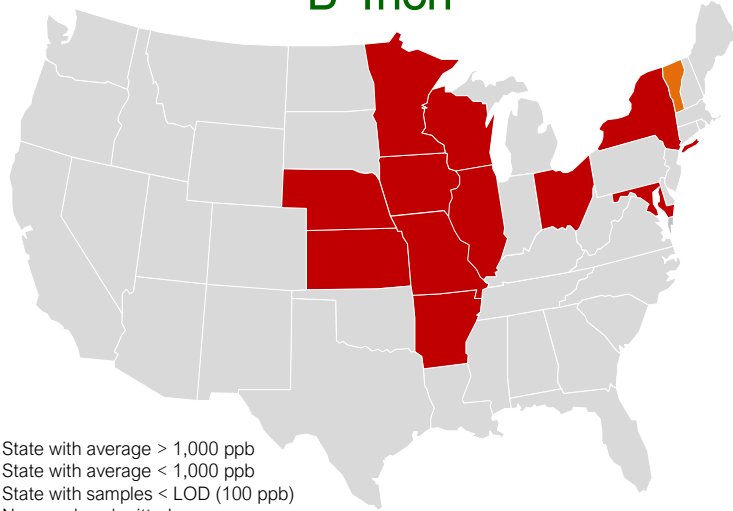


< LOD One Toxin Two Toxins > Two Toxins

2020 Corn By-products Risk by State



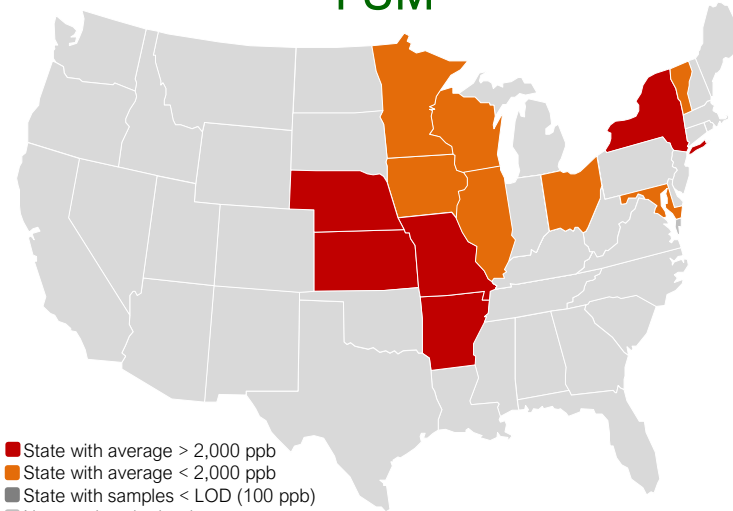
B-Trich



- State with average > 1,000 ppb
- State with average < 1,000 ppb
- State with samples < LOD (100 ppb)
- No sample submitted

State	Number of Samples	% Positive Samples	Avg of Positive Samples
KS	1	100%	5318
OH	3	100%	3405
NY	1	100%	3003
NE	8	100%	2721
MD	1	100%	2717
WI	21	100%	2585
MN	5	100%	2514
AR	1	100%	2472
MO	4	100%	2081
IL	5	100%	1781
IA	38	97%	1805
VT	1	100%	174

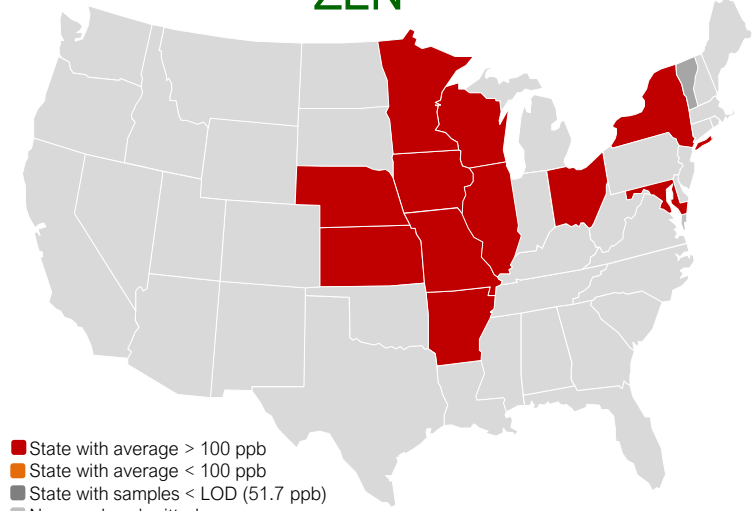
FUM



- State with average > 2,000 ppb
- State with average < 2,000 ppb
- State with samples < LOD (100 ppb)
- No sample submitted

State	Number of Samples	% Positive Samples	Avg of Positive Samples
AR	1	100%	19200
KS	1	100%	14200
NE	8	100%	3885
NY	1	100%	2200
MO	4	100%	2075
IL	5	100%	1940
IA	38	100%	1781
WI	21	100%	957
MD	1	100%	900
OH	3	100%	533
MN	5	60%	400
VT	1	100%	200

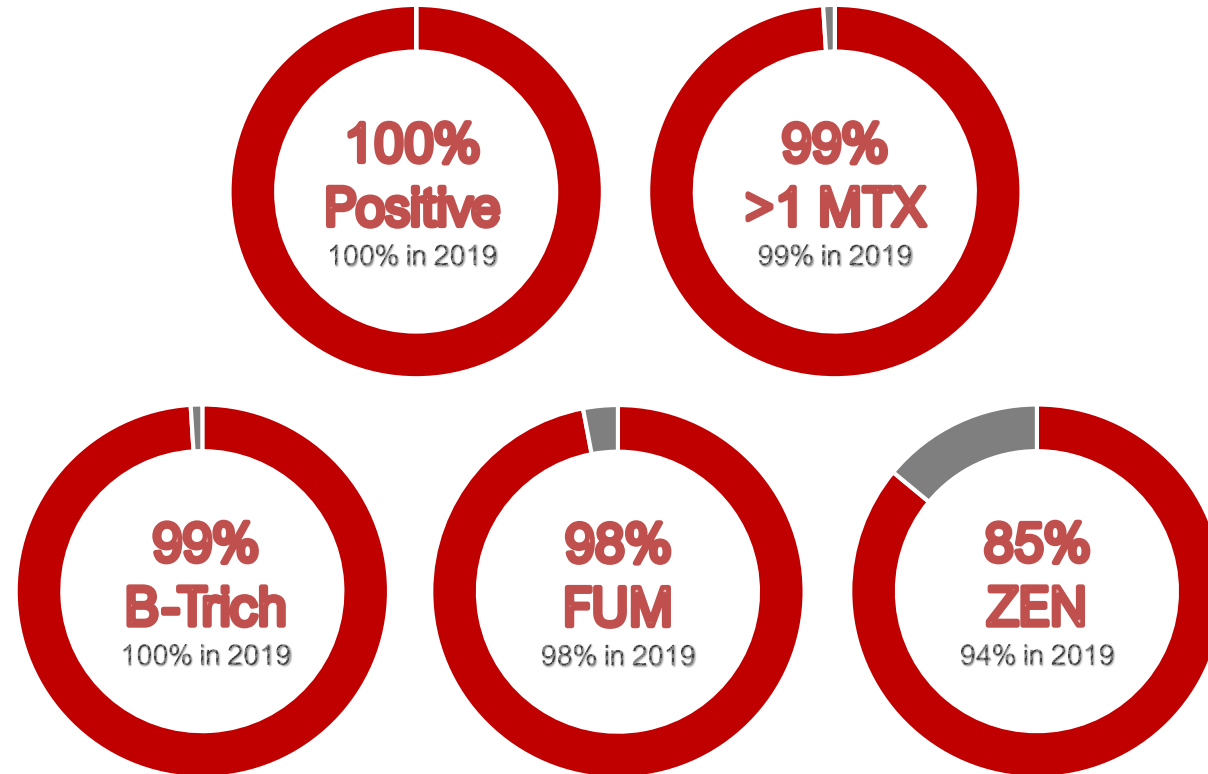
ZEN



- State with average > 100 ppb
- State with average < 100 ppb
- State with samples < LOD (51.7 ppb)
- No sample submitted

State	Number of Samples	% Positive Samples	Avg of Positive Samples
AR	1	100%	932
KS	1	100%	816
MO	4	75%	678
NE	8	63%	500
NY	1	100%	342
MN	5	80%	323
IA	38	81%	274
MD	1	100%	269
WI	21	100%	254
OH	3	100%	245
IL	5	100%	159
VT	1	0%	0

Mycotoxin Survey Summary - 2020 US Corn By-products



Forecasted risk for livestock production:

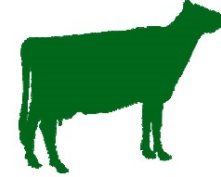
Severity of Mycotoxin Contamination



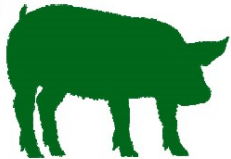
Questions?



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