Crop Yields in CAST

Tom Butler, EPA

7/20/2023

Why do we need Crop Yields?

Fertilizer applications are influenced by the expected yield

Average yields drive long term loads

Annual yields help with the Dynamic Model
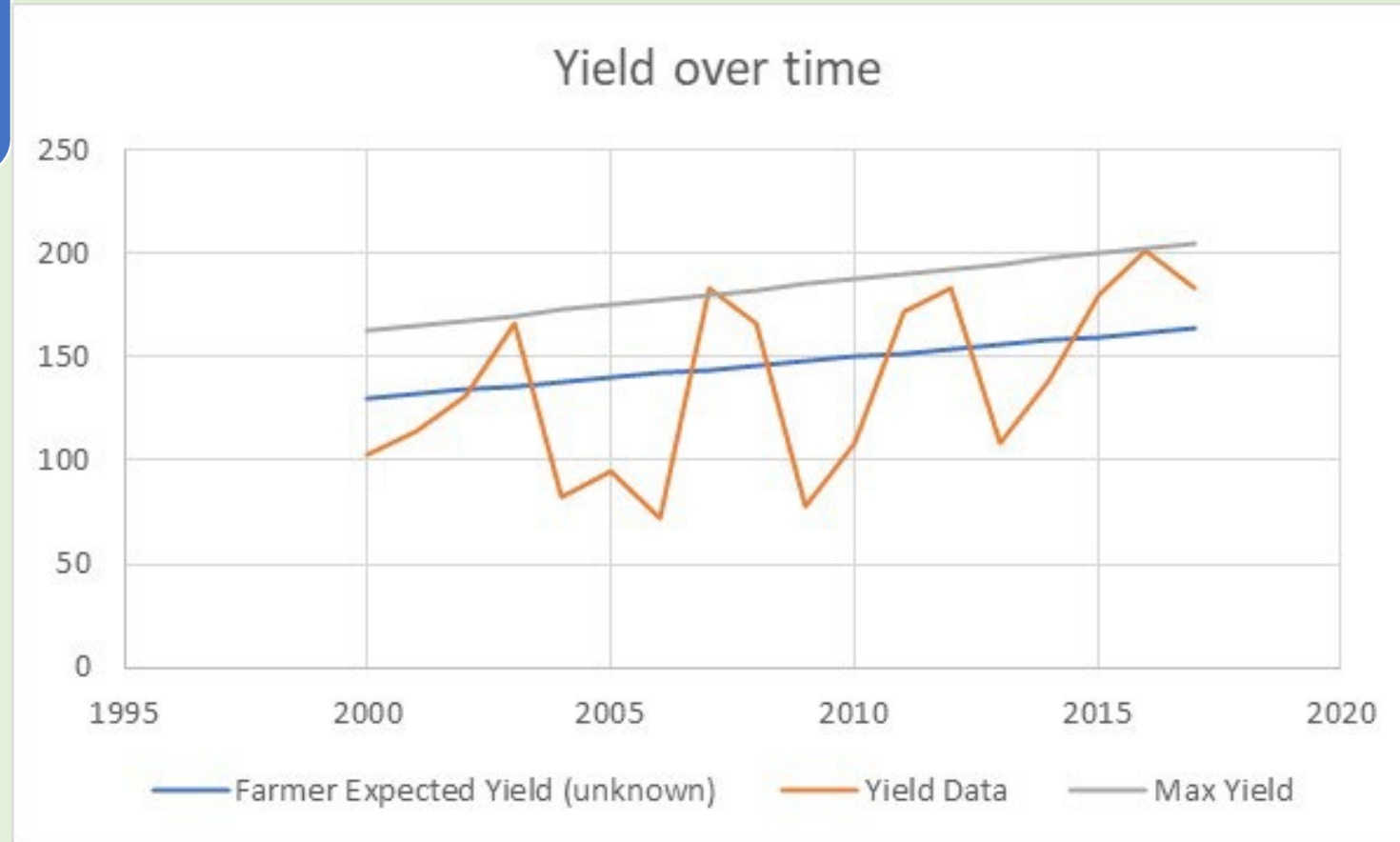
How do we find Crop Yields?

What we do now:

- Combine multiple data sets to get unique values for every crop in every county

What do we want?

We want:

- Long-term average behavior
- Average weather patterns (e.g. drought, good years)
- Expected Yields

Summary

We are thinking of several ways to create a comprehensive crop yield data set

We need input to shape this process

- Additional data sources

Questions?

Fertilizer Expert Group Agricultural Fertilizer Recommendations

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Agricultural fertilizer investigation: Background

The PSC has concerns with the agricultural fertilizer data used in CAST

A formal request was made to examine Phase 6 and 7 solutions

No formal group existed to investigate Phase 6 agricultural fertilizer

The Fertilizer Expert Group was created with State, Federal, and Industry representation to make agricultural fertilizer recommendations

What did the Fertilizer Expert Group do?

Solution	Activity	Completion	Comments	Total Percent Finished
Phase 6 short term (FEG)	Meet individually with jurisdictions to discuss data	X	Completed: Dec 2022	90
	Discuss initial findings with CBP advisory group	X	Completed: Feb 28th 2023	
	Hold first full group meeting of FEG	X	Completed: March 1st 2023	
	Complete data review of preprocessing methods and ag inputs	X	Completed: April 1st 2023	
	MB informal briefing	X	Happens monthly	
	USDA presentation to AgWG and WQGIT	X	Completed: AgWG- April 2023; WQGIT- May 2023	
	Analyze compatability of new data sources	X	Completed: June 5th 2023	
	Summarize investigation results and brief PSC		Completed: IN PROGRESS	
Phase 7 long term (AMT)	Participate in Phase 6 solutions	X	Completed:: June1st, 2023	
	Create living workplan document outlining order of tasks	X	Completed: March 13th 2023	
	Make decisions for Phase 7 model	~~~	In progress through 2025	

What were the groups findings?

Direct state reported fertilizer sales tonnage data are an improvement over AAPFCO.

No additional effort is required to collect direct state data.

Alternative data sources and processing need further investigation for Phase 7.

What did the FEG recommend for Phase 6?

1) Prior to release of a new CAST version, AAPFCO and Direct State reported data should be collected and incorporated into CAST following subsequent recommendations

2) For data covering 2016 and before, AAPFCO fertilizer sales tonnage data should be used.

3) For data covering 2017 and after direct state reports will be collected and assimilated assuming three or more out of six states provided data.

4) The watershed-wide fertilizer sales will be used up through the last year in which conditions under recommendation 3 are met.

What did the FEG recommend for Phase 7?

1) Re-examine the use of both farm and nonfarm categories of AAPFCO fertilizer in calculating fertilizer sales totals.

2) Further examine alternative fertilizer data sets. (e.g. TFI, USDA application surveys)

3) Examine the use of additional fertilizer *application* datasets to ground-truth sales-based application estimates. (e.g. Agrochemical application surveys)

4) Re-examine outlier removal and filling methods.

5) Examine state stock calculations vs watershed wide

6) Examine projection methods for phase 7 (how to create data beyond the last known year)

Summary:

For Phase 6:

- We should be using direct state reported data
- In order to avoid the minority of states dictating trends thresholds for reporting should be used.
- For states that do not have reported data we should use a percent change from the previous year for reporting states to determine the unknown portion.

For Phase 7 the AMT should:

- Conduct in depth searches for different sales and application data sets.
- Evaluate differences in data processing.
- Examine potential applications of state specific fertilizer data.

Questions?

The ask:

- The group will be asked to approve the recommendations made in response to the PSC Decision 2.
    - This was to convene a committee to develop short-term, interim resolutions to fertilizer data concerns before moving forward with CAST 2021/23 as well as long-term resolutions for Phase 7 model.