Why do academics keep throwing these products out?

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Side note

The original title was

“Why do Academics keep Poo Pooing new products?”

I want to walk you through my processes, approaches and ideas.
How I see my job

Un-biased and cautious towards extra cost
I represent the people of a diverse state
Most of us have a past
Test and represent accurately

Trials must be conducted that are properly designed to answer the question or address marketing promises.

Trials must be replicated and analyzed properly.

Data needs to come from multiple diverse environments.
There are Errors on both sides

How do academics and research scientist fail....

Nitrogen/nutrient product and stabilizing testing.

- Testing a N stabilizer or N adding product at the level of 100% Yield Goal.
- Testing at unequal Nutrient levels.
- Not collecting all the data
- Solely relying upon statistics.
How does marketing fail.....

5 bushel and $30 increase due to 2 pt of Mikes Magic Juice over 2 gal Joes Sauce
Media is full of fuzzy math
Statistics

Alpha = 0.05

We say it all the time: P value or Alpha, But what does that mean.

The significance level, also denoted as alpha or $\alpha$, is the probability of rejecting the null hypothesis when it is true. For example, a significance level of 0.05 indicates a 5% risk of concluding that a difference exists when there is no actual difference.
Null Hypothesis

Null Hypothesis Overview

The null hypothesis, $H_0$ is the commonly accepted fact; it is the opposite of the alternate hypothesis. Researchers work to reject, nullify or disprove the null hypothesis. Researchers come up with an alternate hypothesis, one that they think explains a phenomenon, and then work to reject the null hypothesis.

Why Do I need to Test it? Why not just prove an alternate one?

The short answer is, as a scientist, you are required to; It’s part of the scientific process. Science uses a battery of processes to prove or disprove theories, making sure than any new hypothesis has no flaws. Including both a null and an alternate hypothesis is one safeguard to ensure your research isn’t flawed. Not including the null hypothesis in your research is considered very bad practice by the scientific community. If you set out to prove an alternate hypothesis without considering it, you are likely setting yourself up for failure. At a minimum, your experiment will likely not be taken seriously.

Statistics – What error are we ok with

**Type I error**: "rejecting the null hypothesis when it is true". Saying that there is treatment affect when there is not. *False Positive*

**Type II error**: "failing to reject the null hypothesis when it is false". Saying that there is no treatment affect when there is. *False Negative*
What do I need to say “I approve”

I need to know that if I recommend something to work it have a 75% probability of a positive ROI.

It does not have to work in every scenario. But I need to understand when and why to expect success or failure.

If the Mechanism is known and understood my job is easier.

The worst is a 50% positive response where there is no discernable trend in response or lack of response.
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