



## Make the most of your trial plots

**W**ITH corn going in the ground for grain and silage across millions of acres, field trials, seed evaluation plots, and strip trials should also be on your mind. Trials can be geared toward helping your farm find the best seed genetics, agronomic practices, biological treatments, or other technologies aimed to improve energy yield per acre.

Over the past decade, I've helped numerous groups with field trials. In the process, I've learned quite a bit about what works and what doesn't. Admittedly, I've screwed up a lot, and we'll get into my ineptitude in a bit.

With experience now in the bag, I know we can better design and execute on-farm research trials to ultimately make decisions based upon forage energy yield per crop production cost input dollar. Let's get into several "Do's" and "Don'ts" to streamline your research efforts this year. We'll also weave in some exciting insight into a new MILK 2024 model on the horizon. Let's start with covering several issues to avoid.

### ■ Do not compare corn hybrids or treatments grown in different fields.

Here is where I've screwed up in the past. For the first five to 10 years out of grad school, I looked at silage yield and quality data for hybrids or treatments in different fields. I'd run a crude statistical analysis, downplaying the growing environment impact and grower practices, and assume

hybrid or treatment yield and quality would shine through if we had several observations per hybrid or treatment. I was flat out wrong.

I've learned that resulting data are completely confounded if the growing conditions, grower practices, and plant populations aren't accounted for to some extent. Do not compare data for hybrids or treatments grown in different fields. Either run strip trials within the same field or, better yet, run replicated trials where hybrids or treatments are planted in the same plot and then several plots are planted. There are dairies that have done this, with up to 15 hybrids and three replications per hybrid!

### ■ Do not take single samples for forage quality.

Chopped corn is a mix of grain and stover. Sampling chopped corn is no different in sampling error than sampling your total mixed ration (TMR). We know TMR is hard to sample, and so is fresh chopped corn. For each observation in the trial, take at least two or three forage samples for laboratory analysis and combine these several quality observations with yield data for a sound trial data set.

With these issues out of the way, now let's get into several different items your plot efforts need.

### ■ Do calculate your crop production cost per acre.

Experience continues to show this is an input cost that dairies don't have nailed down. To best com-

pare and contrast different hybrids or treatments, we need crop production cost per acre to match up against yield and quality data. Iowa State University has a great template for silage crop production cost per acre.

With a true input cost in hand, the ideal ranking measure for your farm can become forage energy yield per dollar. This could be total digestible nutrients, calories, or milk yield per input dollar. The math behind this is as follows: dry matter yield per acre times forage energy value per pound divided by crop production cost per acre.

### ■ Do ensure your forage quality measures include fiber and starch digestibility.

As described above, corn silage is a mix of grain and stover. Fiber digestibility has long been a focal point for dairy nutrition, but starch digestibility continues to demand more attention. Half the yield in corn silage is grain, and much more than half of the energy in silage comes from the starch. Hence, starch digestibility needs to be accounted for.

Thankfully, the University of Wisconsin-Madison's Cole Dieper-sloot and Luiz Ferraretto have engineered a new MILK 2024 model accounting for digestibility with both of these carbohydrates. The MILK 2006 model adjusted starch digestibility based upon whole-plant dry matter and kernel processing. This new MILK 2024 model brings us into the future by including cur-

rent laboratory measures for fiber and starch digestibility.

### ■ Do consider sustainable silage production.

Carbon inset programs are hitting the market from various groups. I've been covering these programs from a nutrition standpoint, but the carbon inset market may apply to your fields as well. Many modern and new silage production technologies and practices improve resource conservation. Trialing and adopting new technologies and practices can equate to a new value-added proposition for your farm through carbon inset marketing. Consider sustainability and your farm's carbon impact when planning plots this year.

In closing, continue seeking new ways to improve your on-farm research investment geared toward optimizing the \$250,000 and \$350,000-plus spent on corn silage annually for every 500 cows on feed. In addition, better account for the growing environment impact in your plot research.

Determine your crop production cost per acre, then get ready to apply the new MILK 2024 model in your data analysis efforts. Lastly, consider diversifying your revenue stream by evaluating new technologies and practices that may capture more carbon in the milk supply chain. 🐄

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