

## **Observations and Comments from the Soil Nutrient Study Tour and Trade Mission to Germany**

### **Regulations and Farm Policy**

- Illinois and Iowa farmers were a bit surprised that the restrictions on German farmers were not MORE onerous than what we heard. (Of note, upon further discussions with individual farmers, we learned that if farmers missed their nutrient reduction targets it impacted their farm program payments.)
- Some of the activities on or near the livestock farms would not have passed inspection in the U.S., both in terms of the food safety (milking parlor) and in terms of storage (hay piles covered with old tires).
- Farm policy is “damn complicated” according to a farm advisor. Program payments are based upon achievements or measurements on beneficial insects, soil tests, etc.
- The farmers themselves did not talk a lot about farm programs, but they clearly receive them. Some examples include: 5% greening (land where cover crops, peas, flowers, or other alternative crops are grown to contribute positively to the environment, bee health, etc. There are also programs for biogas production (e.g., corn to electricity) but these are ending soon and we heard that without the government support to this program, the biogas systems won’t be able to survive.

### **Production**

- German agriculture comprises just .9% (less than 1%) of the total economic GDP.
- German wheat yields are impressive; with some as high as 10 tons/hectare on wheat. The crop is very competitive domestically and internationally. Some possible reasons include:
  - Seeding rates are higher (rows closer together and a higher rate).
  - Less disease than we have (wheat can be planted after wheat).
  - They can use less nitrogen per bushel.
- We thought there would be a lot more corn grown for livestock; German farmers largely grow corn for silage and/or bio-gas. (This was the most frequently mentioned observation.) Don’t want to spend the money on gas to dry it down.
- Agricultural research in Germany was advanced, but much more focused on taking care of the soil, not maximizing production. They feel if the soil is good, then it will produce better; however, they aren’t increasing organic matter like we are in the States.
- German farmers tended to be somewhat more likely to use more traditional practices or to be limited to more traditional practices by regulations. “This is what I can do and these are my tools” – Midwest farmers felt this perhaps gave them less ability to explore very innovative behavior to manage nutrients.
- It seems that German farmers have a broader vision of how and what to spray or plant while Midwest farmers make year to year decisions depending on market prices and crop diseases or yields. Notably, Iowa and Illinois farmers don’t really have another or a third planting option (other than cover crops)

### **Nutrient Management**

- The fundamental tools available to German farmers have a long history: we learned that the nearly century old practice of soil testing originally started so that the government could tax landowners at rates more appropriate to the production capacity and quality of the soil.
- Farmers in Germany plant a variety of crops, are aware of the latest technology (using precision agriculture to determine the best nutrient management options), and have other established methods to manage nutrients.
- Germany gets less rain and at a much slower rate than in the Midwest. While we often get strong rains of an inch a day or even in a couple of hours, it was significant in Germany to get 7/10 of an inch over 2-3 days.
- Nitrogen leaching is significantly impacted in the Midwest by our harder and more plentiful rainfall. The lighter rains in Germany means that the farmers don’t have to worry much about leaching or about erosion. (German

farmers may get 2-3 inches over 4 days and consider it heavy rain while in the Midwest we may get 2-3 inches in a day!)

- [Anecdotes: Soil samples taken in front of us showed soil was bone dry at 30 inches deep after 3 days of rain. In addition, one of the farmers indicated that this was the “first time he had ever seen 3 straight days of rain”.
- The climate and rainfall differences hugely impact U.S. farmers’ ability to control erosion and manage nutrient applications and content.
- German farmers did not need to employ many of the methods that Midwest farmers typically do (terracing, no-till, contour plowing, etc.) to avoid erosion.
- German farmers are very good at tracking the use of nutrients in and out, but unlike Midwest farmers, they aren’t building any organic matter up in the soil.
- We expected greater use of cover crops. However, without our soil erosion concerns and with the ability to have winter crops like rye, etc. they weren’t as necessary. In addition, due to less moisture and soil holding capacity, German farmers are concerned about conserving moisture. So, if the cover crop is using more water than they feel it is worth, they use a natural cover crop. They don’t want a cover crop that sucks out too much moisture.
- The water absorbing rate of German soil is very good, but it doesn’t hold water as long as our soil.
- German farmers seem to manage their nutrient management rules. Because of less rain and lighter rains, they have some more opportunities to manage in a variety of ways. Midwest farmers likely operate with shorter windows of opportunities and a smaller tool box to manage nutrients.
- German farmers are well placed to measure nutrient impact due to long-standing soil testing data and the regulations in place. Regarding that’s the response of the group to the Nitrogen Balancing? We do it already, we just don’t document it. They are naïve to think that nitrogen can be used and recorded the way it is. It isn’t just a number in and a number out. at least we didn’t hear any complaints. They are balancing to +50 kg/ha over a 3 year average. Their calculation in and out works better than ours because they don’t have any significant leaching like we do. Our challenge is the weather events that result in a much more variable nutrient level in Iowa or Illinois than you would ever see in Saxony.
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### **Society/Culture**

- Like the U.S., but even more so, the rural areas (villages) of Germany are losing residents and jobs to large cities. Many are declining to such an extent that no schools, supermarkets, or post offices were seen in several of the villages
- The farmland near villages directly abuts the village where we travelled. There weren’t industrial parks or something else between villages and farmland.
- In the U.S., farmers tend to live outside of rural towns on their own land, at the farm.
- German reunification had an incredible impact on agriculture for multiple reasons not limited to changes on land ownership and management of farm land.

### **Conservation Tillage**

- Soil erosion was largely non-existent in the areas we visited. We expected to see more conservation tillage than we did. In fact, we were a bit surprised at the number of times the ground is tilled in Germany (and this perhaps explains the lack of weeds in fields despite German farmers not having access to biotech crops).
- German farmers till the land more times than American farmers and can do multiple herbicide applications (e.g., when they till) as necessary to fight weeds.
- They are a little more stuck in their traditions and they are limited by having to use manure and get it incorporated and that restricts, somewhat, what you can do.

- Resistant weeds are not as huge of an issue as in the U.S., probably due to the more frequent tillage and more diverse crop base. Midwest farmers started relying more on weed killers when they moved towards more conservation tillage and more of a duo-culture of crops (corn and soy).
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### **Trade and Globalization**

- Most of the food and agricultural products produced by German farmers are sold within Germany, so farmers have limited interest in exports and trade.
- Where we saw interest (e.g., sugar) immediate mention was made that he wondered whether and how U.S. sugar program would change because the German sugar program will end in 2017.
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### **What Take-Aways will you come home with?**

- German farmers are very capable managers with an interest in and application of research and technology (often sponsored by the farm organizations and government rather than by private industry).
- The farmers are interested in having access to biotechnology, but seem capable at the moment of working with the restrictions they have. If biotechnology were offered, it would spread rapidly in certain areas, most likely the west and north.
- Farmers all over the world are facing increasing regulations due to a lack of understanding of agriculture by consumers and government.
- German and Midwest farmers face the same challenge (and opportunity) in terms of communicating with consumers. Both farm groups have consumers that want farming to look like it did 50 years ago. Like our farmers, German farmers are aware of this and worked to be transparent and to reach out to local consumers, media, and legislators. At the federal level, the agriculturalists and the government have big challenges reaching the media and receiving fair coverage.
- American farmers need to better understand how we need to apply our Nitrogen; we are all working on it, but German farmers have some advanced abilities in this area.
- Farmers all around the world face increasing regulations. Optimistically, Midwest farmers have an opportunity to control our own destiny by: knowing what we are doing with nutrients, where nutrients are going or how they are taken up (cover crops), measuring efforts and results, and essentially showing how we are working to improve the situation. To get 100% buy-in, Midwest farmers need to see the economic advantage of getting the nutrient management right.
- Long term sustainability of their agricultural system, technology keeps the crop production moving forward, what about subsidies and how long will they be able to sustain it. Now they have large corporations coming in that can still get the subsidies – but they want small farms.
- Quotes from Iowa and Illinois farmers:
  - “We are staring at the future of American agriculture, so we need to try to frame the policy and regulations that we can and what can we do to avoid the most draconian or onerous regulations.”
  - “Farming in Germany here is like painting in that the farmer has an image or picture in his mind of what he hopes to achieve and then he uses his different tools or methods to get there.”
  - “Politicians have more of an influence on policy here than they do in the U.S. and geopolitical issues drive decisions here just like they do in the U.S. (RFS/biogas).”

They do test the water from time to time (first farmer mentioned it and testing his tile). There is a hypoxic zone in the Danube – there are about 90 of them. Mississippi River water shed is the 3<sup>rd</sup> largest in the world Relative to the area drained, the Mississippi hypoxic zone is smaller than nearly all of the others.

Commonality of the issues: animal welfare, regulations, farm programs, etc. Their consumers are further removed from farming than in the U.S. and tend to watch the headlines. Their advocacy organizations have to carry the dual function of being an extension service and an advocacy group. What they say is kind of influenced because they get federal government funding. So, they have to be kind of careful what they say.

Rural communities in general are deteriorating in a similar way as some areas of the U.S. Education, services, etc. are further away. They are worried about their communities as we are.

Some of the folks who are on the buying and investing sprees have interests outside of agriculture and may be able to sell their ability to invest and save better than they can actually make a nice life for the people.

We thought the buildings and barns and such would be really worn down in East Germany. Mike Orso noted that it was worse and that lots of changes and improvements have been made since he was here in the 1990.

The transition from cooperatives seems to have gone well. The reunification has gone on fairly well. We look at it and we see a productive agriculture. We saw a lot of nice equipment on the farms, farms that have some work needed, but families living on them.

You don't see much grain storage on farms. They aren't going to be an exporting player in the world market. Their percent GDP in ag exports is going to be miniscule. We aren't going to have to worry about competing against them in the world market. They seem to want to be self-sufficient and not too much beyond that.

90% of their storage is probably flat storage, you harvest wheat dry, you have dry air, you don't need to have the dryers and vertical storage.

Their agricultural system and educational system doesn't lend itself towards production and being a better producer. They don't encourage kids to think about agriculture, agri-science, etc.

Very small percentage of the population works in agriculture. Interesting that the twins were going to work on an organic farm and that the Ambassador mentioned it that way publicly as if it was something to be proud of.

Public perception, rather than science, driving policy here. Science isn't leading the discussion here.

Amazed that they don't have erosion like we do. As long as we have the rainfall that we do, we are going to have gullies and it causes loss of phosphorous. How different it is, you have a western Kansas summer here without the summer heat.

Surprised at the length of land leases that they negotiate – 20 years. And, the leases got longer as you moved east. Right after the break-up of the Soviet Union, some of the first fixed crop share leases were 49 year leases. That has fallen to 20 years or so. Farmers in eastern Germany want to keep their land as long as they can, so they don't mind the long leases.

Our ancestors came out of Germany, Holland, Bohemia, etc., out of a village concept. But the village concept back then was the castle and serfs living around it. Our families left that and went to America and became landowners. Your home is your castle. We could own land. That's why property rights matter so much to Americans.