

# PLANT NUTRITION TODAY

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## THERE ARE POOR GROWTH AREAS IN A FIELD! WHAT IS THE PROBLEM?



A farmer invests a lot of time, money, and hard work into each crop. The ultimate goal is to grow a high yielding and good quality crop in all portions of a field. However, most cropped fields tend to have better and poorer areas of crop growth. It seems that the poor growth areas are especially noticeable in years of adverse crop growth conditions, such as a shortage of adequate moisture.

Under such conditions farmers are often interested in finding out what the limitation to crop growth is, and determine if there is some way to correct the problem. It is common for a farmer to ask for help in assessing the poor growth areas. This is when a crop adviser, or consulting agronomist can be called upon to make a visit to a field in question.

One of the common mistakes is to rush into making a diagnosis, and not make objective and accurate observations. I have found a person needs to be careful not to let your field of interest or specialization narrow your "field of vision". By this I mean that all too often a soil

fertility expert will look for and come up with a plant nutrient deficiency, and weed control specialist a residual herbicide problem. Now, you cannot ignore experience and knowledge, but it is important to make unbiased observations.

I can remember being asked to come and look at a field with a farmer and the local crop adviser, when I worked as a regional agronomist for a grain buying and crop input company. It was a bit drier than normal that year, not a drought but just less than ample moisture. A farm customer had some poor growth areas in a field and in discussion with fellow farmers at the coffee shop, it was suggested that it might be a copper deficiency. I admit having a background in soil fertility, I have to be careful not to look only for nutrient deficiencies when observing fields, especially when a farmer has been influenced to think it was a micronutrient deficiency, and was expecting such a diagnosis.

Fortunately, I had been taught by an agronomy instructor not to jump to a conclusion, but make observations



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first. There were definite patches of stunted, poorly growing crop among an overall field of reasonably adequate crop growth. I suggested that we not only observe the crop top growth, but dig some shallow pits, observe crop root growth, and as well as look at soil characteristics. In this situation, it was soon noticed that the poor growth areas had soils that had a compact subsoil layer at about a depth of 12 inches (30 cm) that restricted crop roots from growing deeper. These types of soils are characteristically higher in sodium content compared to soils in the better growth areas. The high sodium content causes the formation of an enriched sodium and clay content compact layer. In an ample moisture year, this is less limiting to crop growth, but shallow rooting in a year of lower moisture shows up soon. These soil patches were originally slightly saline when the soils started to form in the area, and one of the main salts present being sodium sulfate.

The farmer asked “Well, can I do anything to improve the soils in these poor growth areas?” My answer was yes, a soil supplement such as gypsum (calcium sulfate), or calcium-magnesium sulfate, could be applied to and worked into the soils of the poor growth areas. The added calcium and magnesium would replace excess sodium and over time the soils could



be improved for growing crops. However, I cautioned it may take 20 to 30 years for the whole process to happen to see much difference. In the end, I suggested that economically and practically there was not much could be done. Generally decent crops were grown on the field as a whole, and the poor growth patches were a result of soil properties that the farmer had little control over. But, at least the farmer didn't waste money applying micronutrients for a possible micronutrient deficiency.