Yellow stunted grain plants likely due to drought stress

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Summary: Stunted grain plants with yellow or spotted leaves may be due to nutrient deficiencies caused by drought stress.

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BOZEMAN – The Montana State University Schutter Diagnostic Laboratory has been receiving numerous samples of wheat plants that have yellow, or yellow and brown spotted, lower leaves. Given the spring weather, and lack of diagnosed disease in many of these samples, frost damage, drought stress, and nutrient deficiencies are likely culprits.

Nutrient deficiencies may seem unlikely for those who used starter fertilizer, but plants need water to take up nutrients, and many areas of the state received well below normal precipitation in April and early May.

"Immobile nutrients, such as phosphorus, potassium, and zinc, are especially reliant on water to help them move toward plant roots," said Clain Jones, Extension soil fertility specialist in the Department of Land Resources and Environmental Sciences at Montana State University.

Another possible cause of some of the deficiencies may be the record rains last August.

"These would have leached mobile nutrients, such as chloride, nitrate, and sulfate, out of the upper root zone," said Jones.

Small grain roots will eventually catch up to these nutrients, but winter wheat that is stressed due to drought and frost will take longer than normal to reach those nutrients. Chloride and nitrate deficiencies will show up first on lower leaves, sulfate on upper leaves.

In addition, urea broadcast in the last 30 days may not have received enough moisture to convert to available nitrogen forms or be pushed down into the root zone.

Producers have a couple of options. The first is to wait for moisture and warmth. "Applying nutrients that may already be in the soil but aren't being taken up because of the dryness would be a waste," noted Jones. If you've fertilized with nitrogen this winter or spring, and applied both sulfur and potash for potassium and chloride with your seed, then the nutrients are likely there but aren’t being taken up in large enough amounts by the plant roots because they're stressed. Patience may be the best strategy in this case.

However, if you did not apply potash or sulfur, then a chloride or sulfur 'rescue' treatment may be warranted. Contact your county Extension agent or crop adviser about soil and tissue testing and to determine fertilizer options.

For more information on soil fertility, see Jones's website http://landresources.montana.edu/soilfertility, or contact Clain Jones at clainj@montana.edu or 406-994-6076.