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Information for Saskatchewan Pulse Growers regarding white spots and yellowing on lentils

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Over the past week, the Saskatchewan Ministry of Agriculture received many inquiries as well as samples submitted to the Crop Protection Laboratory, related to white spots or chlorotic speckling of lentil leaves (Figure 1) and general crop yellowing and leaflet drop (Figure 2).

Figure 1. White speckling on lentil leaflets due to wet weather, causing cell rupture.
Source: Jennifer Deeks, Viterra

Pathogenic organisms or insects are not likely the cause of these speckling symptoms. A physiological reaction to prolonged wet weather causing rupturing of cell walls is a more likely explanation in most situations. Theories vary on the impact to the plant. For example: lack of oxygen in the root zone and an inability to absorb some nutrients, such as potassium, are commonly cited.

Figure 2. Yellowing of lentil leaflets due to water stress.
Source: Jennifer Deeks, Viterra

Saturated soil, cool conditions, lack of sunshine and soil-borne pathogens can cause crop yellowing. Given the conditions we have experienced so far this year, crop yellowing during early growth stages can be expected due to a combination of these and other factors.

1) Roots need oxygen. When soil is saturated, air pores in the soil fill with water causing roots to function poorly or not at all, resulting in yellow top growth.
2) Cool growing conditions result in seedlings with a slowed rate of metabolism. Slow root growth can cause plants to turn pale green, while near-freezing temperatures can cause yellowing.
3) Lack of sunshine causes plants to turn pale green and yellow due to a reduction in the process of photosynthesis.
4) When plants are stressed under adverse conditions, they are more susceptible to seedling diseases such as damping-off, root rot and seedling blight. Symptoms

often involve yellowing, wilting, stunting or death. Causal pathogens are often fungi that prefer warm, moist conditions.

The solution to crops affected by this spring's saturated soil is a few days of warm, dry weather and sunshine that will allow the crop to recover. However, while some plants may grow out of their seedling disease issues, others may die or do poorly. These will likely be confined to patches within the field where the soil stays saturated for prolonged periods. It has been noted that in some fields the symptoms are on older leaves, while new growth appears healthy. Crop scouting, including checking root nodule health, will be critical for proper nutrient management, as well as weed and pest control, particularly in fields that have been stressed by poor conditions.

If lentils are stressed, their herbicide tolerance may be compromised. If the metabolism of the plant is not functioning properly, it can't break down herbicides that it would normally be able to do. If sprayed in this condition, Clearfield (CF) lentils may suffer from the effects of the herbicide much the same as a non-CF lentil. Wait until plants turn green again before spraying.

In some cases, diseases such as ascochyta have also been identified on the same plant as the stress-related symptoms noted above. It is important to properly identify disease symptoms and remember that early signs of disease do not necessarily translate to immediate need for control. Fungicide timing is important and so is the weather we receive once we reach the proper growth stage for control. For lentils, best control will be achieved prior to canopy closure, with one or more additional sprays in 10 to 14 days to protect the flowers, if disease risk is high and weather remains conducive for disease. For more information, refer to *Lentil Disease Scouting Tips* found in Pulse Agronomy Network (PAN) Bulletin #7 (June 7, 2010).