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# Ornamental Cabbage and Kale: Water Stress Induces Lower Leaf Loss

*Ornamental cabbage and kale, similar to all brassica species, are not tolerant of water stress. Excessive wilting of the plants will result in lower leaf yellow and leaf drop. Maintaining adequate moisture levels is the primary method of avoiding this situation.*

The peril of low fertility induced lower leaf yellowing of ornamental cabbage and kale (*Brassica oleracea* var. *acephala* L.) was highlighted in e-GRO Alerts 10.32 (2021) and 3.45 (2014), and Nutritional Monitoring Guide 1.22 (2018) provided fertilization guidelines. This Alert discusses a mimic of low fertility, drought stress, which also results in lower leaf yellowing of brassicas.



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Figure 1. Drought stress (wilting) will result in lower leaf yellowing of ornamental cabbage and kale. (Photo: Brian Whipker)

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Figure 2. A gallery of lower leaf yellowing caused by drought stress (A) , low fertility (B & C), and overcrowding (D). (Photos: Brian Whipker)



Brassica species can tolerate a wide range of growing conditions, but they are intolerant of excessive water stress. For example, if young cauliflower transplants are subjected to water stress as plugs, the plants will often prematurely form heads and never develop into a full sized plant.

For ornamental cabbage and kale, they are grown in the Southern U.S. as a fall color crop. Their production phase is during the hottest part of the year. Water management issues can arise due to excessive drying conditions and this can lead to wilting.

Excessive wilting will result in lower leaf yellowing and loss (Fig. 1, Fig. 2A). This mimics a low fertility situation (Figs. 2B and 2C). To diagnose the problem, determining if the plants were subjected to water stress is the first step. Testing the substrate electrical conductivity (EC) can also be done. Overcrowding plants can also result in shading of the lower foliage, which will then yellow and drop (Fig. 2D).

### Managing Irrigation

A few years back, NCSU Ornamental Researchers Ted Bilderback and Stu Warren conducted drip irrigation studies on ornamental species to look at the impact of substrate temperatures and root

development. They found that irrigating plants more frequently at 10:00, 14:00, and 16:00 resulted in improved water use efficiency, cooler root zone substrate temperatures, and the plants had a greater root and shoot mass. The irrigation water acted as a cooling agent that allowed the plant to improve overall growth. This concept would be readily applicable to ornamental cabbage and kale production as well as fall mums.

In visiting growers the last few years, a few fall mum crops have been inspected for root development. For growers who place the irrigation drip emitter on the side with the greatest exposure to the sun (south), those plants had improved root mass throughout the entire pot. When the drip emitter was placed on the north side of the pot, root development was less on the southern exposed side of the pot. Any production practice that improves overall root development will have a positive impact on plant growth.

### Summary

Water management is important in the production of ornamental cabbage and kale. Lower leaf yellowing and loss can occur if plants are allowed to wilt. Keeping the plants adequately irrigated will avoid this situation.



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