Symptoms of Water Stress in Grapevines

From: **Recognizing and Responding to Drought Stress in Maturing Grapevines.** Robert M. Pool and Lakso, Alan N. Cornell University Dept. of Horticultural Sciences, NYS Agricultural Experiment Station, Geneva.

With increasing severity and duration of water stress, vines develop the following symptoms:

1. The angle between the leaf blade and the petiole will decrease from about 90° to less than 45°.
2. Leaves in direct sunlight will feel "hot" to the touch
3. Lateral shoots will dry and fall at the node attachment.
4. New leaf formation will slow, and most leaves near the shoot apex will be fully expanded.
5. Tendrils will dry up and fall off.
6. The shoot tip will fall and there will be no new leaf production.
7. Shoots will be shorter than normal.
8. Leaves, especially those in full sun, will become pale with a bleached green appearance.
9. Grape berries will be smaller than normal and clusters will tend to be loose.
10. Leaf margins will become scorched.
11. Basal leaves will become chlorotic and fall.
12. Rachis at the ends of clusters will dry out.
13. Depending upon time and intensity of stress, veraison may be delayed.
14. Fruit may cease soluble solids accumulation. Percent soluble solids (juice brix) may continue to increase because of berry dehydration, but sugar accumulation (soluble solids per berry) will cease.
15. Root growth will be reduced.
16. Shoot diameter will be less than normal.
17. Periderm formation will start early, but be incomplete.
18. Berries will shrivel, and for some varieties, fall to the ground.

Other consequences of drought will be:

1. Development of potassium deficiency symptoms in leaves even though the top soil has adequate potassium.

2. Development of other nutrient deficiency symptoms, especially nitrogen.
3. Reduced root system size.
4. Reduced uptake of sufficient nutrients in late fall and early summer to sustain normal development of flowers the next spring.
5. Grape musts may be very high or abnormally low in acidity.
6. Musts may not supply wine yeast with the normal compliment of nutrients leading them to break down proteins, metabolize amino acids and produce off flavors.
7. Wines may not age properly.
8. Vine size and capacity to produce a full crop will be reduced for one or several years.
9. Herbicides may not be effective and deep-rooted perennials may become established.
10. Insect and other arthropods will tend to reach higher populations than normal.

From:
Recognizing and Responding to Drought Stress in Maturing Grapevines. Robert M. Pool and Lakso, Alan N. Available at: https://ucanr.edu/sites/ucmgnevada/files/192650.docx .