

PLANTS ON THE RUN

PLANT RESPONSE TO DROUGHT AND HEAT STRESS



When the climate changes, so do the presence of plants in different areas worldwide. The fossil record has proven invaluable in tracking plants from one location to another in response to drought and heat stress, showing that plants are indeed mobile organisms. For plant species, migrating in response to environmental changes is a matter of survival.

To understand how plants may cope with environmental changes such as drought and heat stress, scientists at the University of Washington compiled geographic coordinate data for the locations of nearly 300 plant species within seven distinct regions (including Arizona) across western North America. Researchers compared these findings to changing environmental conditions, such as drought, temperature, rain, and snowfall. The expectation was that plants would move toward cooler temperatures, but the research indicated that *water* was a more defining factor than temperature.

Drought is a distinctly different stressor than high temperatures on plants, and plants respond to each differently. "Some plant species are very tolerant of drought, some very intolerant, some in-between," says Professor Alex Niemiera, School of Plant and Environmental Sciences at Virginia Technical University. "Soil type will also affect drought response. Plants growing in moisture-retentive soils fare much better than those in less retentive soils." Extreme heat may eliminate plants that do not have the mechanisms to withstand even short episodes of high temperatures. To survive rather than go extinct, plants must shift their distribution, alter their annual vegetative and reproductive cycles, or acclimate or adapt to environmental changes.

Several strategies to support the current landscape plant palette during stress, including appropriate irrigation practices, fertilizer and pesticide application reduction, and minimal pruning, will prove beneficial. Surface mulches will reduce evaporation and lower soil temperatures. Planting times are more crucial during prolonged stress periods. Even though one can install landscape plants at any time during the calendar year in Arizona where the soil does not freeze, preferred times such as mid-fall and early spring result in better establishment and, in turn, longer-lived plants, reducing costs and labor. Some plants may survive and perform well, while others may not. In all likelihood, the landscape plant palette will change.

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