VITICULTURE

Grapevines under stress

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Crops in Europe are exposed to increasingly elevated CO_2 concentrations, enhanced temperatures and intense droughts, which can have important effects on production. Grapevines are no exception.

Tefide Kizildeniz from the Universidad de Navarra, Pamplona, Spain, and co-authors examine the individual and interactive effects of these stressors on grapevine yield and quality. They cultivated cuttings of two types of grape (red and white Tempranillo, an extensively cultivated grape native to Spain) at different CO_2 levels, temperatures and water availability regimes, from fruit set to maturity in specially modified greenhouses.

The effects were variety-dependant, with overall better red grape performance than white. High temperatures and drought reduced the growth of both Tempranillo varieties, but elevated CO_2 was able to compensate for this by enhancing photosynthesis. Yield was less affected than growth and was variety-dependent, with more red grapes produced than white grapes.

These results highlight the need to consider the combined effects of the various climate stressors on grapevine performance and on different varieties to inform crop planning and management. *ET*

PUBLIC OPINION

Aggrieved China

Environ. Sociol. http://doi.org/536 (2015)

There is a large and growing body of social science research on why some people continue to doubt scientific findings on climate change. Most of this work focuses on developed countries, however.

John Chung-En Liu from the University of Wisconsin–Madison seeks to address this blindspot. He conducts a critical discourse analysis of books, news reports, commentaries and online discussions to understand the nuances of climate contrarianism in China. Liu finds that arguments questioning mainstream science are rooted in a 'climate nationalism' specific to a Chinese context.

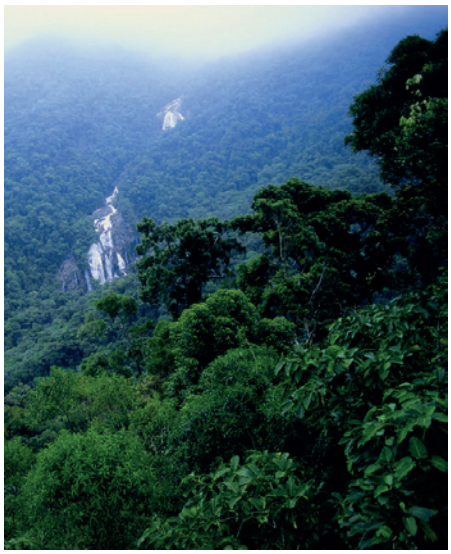
He finds that political commentators are quick to accuse institutions — be they Wall Street, the US government or the IPCC — of protecting the interests of the West to China's detriment. These theories of a 'western plot' founded on climate change are exacerbated by mistrust in non-Chinese scientists, Liu finds.

In the US and Europe, climate science and environmentalist ideology are often attacked. But in China, climate contrarianism doesn't necessarily rule out support for environmental regulation, Liu says. Understanding these national differences is essential to garnering global public support for climate change policies. *MH*

FOREST ECOLOGY

Firing photosynthesis

Geophys. Res. Lett. **42,** 4654–4662 (2015)



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Aerosols — fine particles and droplets suspended in the atmosphere — scatter incoming solar radiation. This light diffusion effect can help plants to increase their photosynthetic efficiency, which has implications for ecosystem carbon dynamics. Human activities that increase aerosol loads, such as deforestation fires, can therefore increase net primary productivity — this effect might be worth including in carbon accounting.

Alexandru Rap, from the University of Leeds, and co-workers investigate the effect of aerosol emissions from biomass burning across Amazonia during 1998–2007. They find that these emissions increase mean diffuse radiation by 3.4–6.8% and net primary production by 1.4–2.8%. This increase in primary production might seem modest but they calculate that it offsets the equivalent of 33–65% of the annual regional carbon emissions from biomass burning. The enhancement of primary production occurred during the dry season, counteracting some of the negative effects of drought on tropical forest growth. *AB*

CLIMATE IMPACTS

Shifting sands

Int. J. Climatol. http://doi.org/535 (2015)

Desertification, the expansion of desert regions, can result in changes in albedo, the hydrological cycle and surface roughness, all of which affect the local climate. The question remains whether desertification can cause changes further afield — at the global scale.

Ye Wang of Nanjing University of Aeronautics and Astronautics, China, and collaborators use a medium-complexity Earth system model to investigate the local and global effect of desertification at different latitudes in the Northern Hemisphere for the period 1700 to 2000. They consider latitudinal bands of 15° width from the equator to 60° N, and the simulations began with land cover as it was in 1700, with desertification affecting grass and forest cover through time.

Changes in the 15–30 °N and 45–60° N bands were found to have a stronger effect on global climate, resulting in temperature decreases of more than 2 °C in the boreal summer. Desertification, particularly in the 45–60° N band, increased ocean heat transport. These results highlight the far-reaching effects of desertification and indicate the teleconnections that need to be considered. *BW*

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