

MEET YOUR COTTON RESEARCHER

Dr Demi Sargent, Postdoctoral Research Fellow,
Western Sydney University & affiliate of CSIRO

PROFILE

FEBRUARY 2024

RESEARCH AREA

Abiotic stress (ie heat and drought) & photosynthesis

Abiotic stress is defined as the negative impact of non-living factors on living organisms in a specific environment. The stresses include drought, salinity, low or high temperatures.

Photosynthesis is the process by which plants use sunlight, water, and carbon dioxide to create oxygen and energy in the form of sugar to grow.



WHAT'S YOUR BACKGROUND?

I grew up on a dairy farm in rural northern Victoria after my parent immigrated to Australia from Northern Ireland. During my upbringing, I witnessed my dad battle through the millennium drought – not a week went by without him discussing water prices and availability, and waiting desperately for the next drop of rain. These memories are what drove my passion for understanding the effects of abiotic stress on agricultural systems, and how we can help farmers combat it through research and innovation.



IS A JOINT INITIATIVE OF



BEST
PRACTICE
✓

MEET YOUR COTTON RESEARCHER

Dr Demi Sargent, Postdoctoral Research Fellow,
Western Sydney University & affiliate of CSIRO



HOW DID YOU END UP IN COTTON RESEARCH?

I was fortunate enough to participate in the CSIRO Summer Research Scholarship program, where I worked on a heat and drought project in cotton with Warren Conaty in Narrabri. This was my first experience with cotton and working on abiotic (i.e. heat and drought) stress, and where I saw a future for myself working on improving cotton's abiotic stress resilience. I have since completed my PhD where I investigated the diversity in photosynthesis and temperature sensitivity among species within the cotton genus – *Gossypium*. This then led to my current postdoctoral fellowship, where I'm building a pipeline for genetically engineering the superior photosynthetic mechanisms of wild *Gossypium* species into cotton

HOW WILL YOUR RESEARCH BENEFIT THE GROWER?

The ultimate goal of our research is to safeguard the cotton community against the detrimental effects of climate change. Our work seeks to improve cotton's productivity and resilience under challenging future climates that are hotter, drier and more unpredictable. We aim to provide cotton varieties that can continue to maximise yield without using more water or other resources even during extreme heat events.

HOW WILL IT BENEFIT THE INDUSTRY?

We aim to stabilise cotton production and prevent the substantial losses that typically occur during drought years and heatwaves. With water being a huge driver of cotton production, particularly during hot years where cotton demands more water, we intend to reduce this burden by developing more heat tolerant and water use-efficient cultivars.

WHAT ARE YOUR KEY FINDINGS TO DATE?

We have identified that wild cotton species possess superior photosynthesis and thermotolerance traits critical to developing Climate-Proof Cotton. We have started transferring these traits to bacteria and a relative of tobacco, critical first steps towards introducing these traits into cotton.

WHAT DO YOU LIKE DO WHEN YOU AREN'T RESEARCHING?

I love fishing, bird-watching, hiking and beekeeping with my hubby 😊

For further information:

Visit www.cottoninfo.com.au



IS A JOINT INITIATIVE OF



BEST
PRACTICE
✓