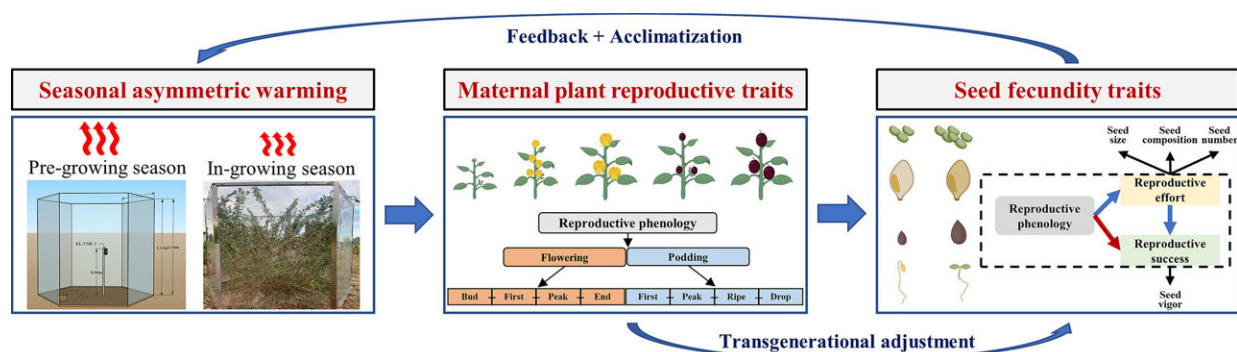


How asymmetric warming impacts seed reproduction of sand-stabilizing shrub *Caragana microphylla*

September 15 2023, by Li Yuan



Credit: *Science of The Total Environment* (2023). DOI: 10.1016/j.scitotenv.2023.166387

Caragana microphylla is a shrub and one of the important tree species for afforestation in arid and semi-arid areas of northern China. Its potential for natural regeneration and population expansion and its ability to maintain structural and functional stability of the ecosystem in sandy areas mainly depend on the development, spread and establishment of its seeds.

Therefore, exploring the sensitivity and response patterns of seed propagation of sand-fixing shrubs to seasonal asymmetric [warming](#) is significant for understanding their adaptation mechanisms to future

climate warming, and facilitating regional ecological environment construction and vegetation stability restoration.

A research group led by Liu Xinping from the Northwest Institute of Eco-Environment and Resources (NIEER) of the Chinese Academy of Sciences (CAS) conducted a field warming experiment to investigate the seed reproductive strategy of *Caragana microphylla* from the perspective of reproductive [phenology](#), reproductive effort, and [reproductive success](#).

This study was published in [Science of The Total Environment](#) on Aug. 24.

The researchers investigated the effects and differences of temperature increases at different times on their reproductive phenology and seed fertility, and they analyzed the response strategies of seed reproduction to seasonal asymmetric temperature increases in terms of reproductive effort and success.

They found that reproductive phenology adapted to asymmetric warming by starting earlier, ending later, lasting longer, and decreasing synchrony, while this adaptation increased and hindered the reproductive effort and success of seeds, respectively.

Reproductive phenology adaptability and the reproductive effort and success of seeds positively correlated to growing [season](#) temperature and warming duration, while pre-growing season warming had negative effects on reproductive effort and success.

"Seasonal asymmetry and duration of warming can alter the seed reproductive strategy by adjusting reproductive phenology patterns and [seed](#) fecundity traits, in which a warmer growing season and an extended warming duration could mitigate the adverse effects of pre-growing

season warming," said Liu.

More information: Hongjiao Hu et al, Asymmetric pre-growing season warming may jeopardize seed reproduction of the sand-stabilizing shrub *Caragana microphylla*, *Science of The Total Environment* (2023). [DOI: 10.1016/j.scitotenv.2023.166387](https://doi.org/10.1016/j.scitotenv.2023.166387)

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