

# Abiotic stresses



## SIGNALING



### PRIMARY METABOLISM

- Photosynthesis
- Carbohydrate metabolism
- Fatty acid synthesis
- Transcription
- Protein synthesis
- Nucleic acid synthesis

GROWTH

down-regulated

### Regulatory proteins

Transcription factors  
Protein kinases

Vesicular  
trafficking

### USE OF ENERGY STORES

- Lipid degradation (glyoxylate cycle)
- Autophagy
- Proteasome

### PROTECTANTS

- HSPs
- Chlorophyll binding proteins?
- Osmolytes:
  - Mannitol
  - Proline?
  - Urea?

up-regulated