



# *Antworten auf die globale Resistenzsituation*



Dr. Anita Küpper  
*Weed Resistance Research*



WEED  
RESISTANCE  
COMPETENCE CENTER

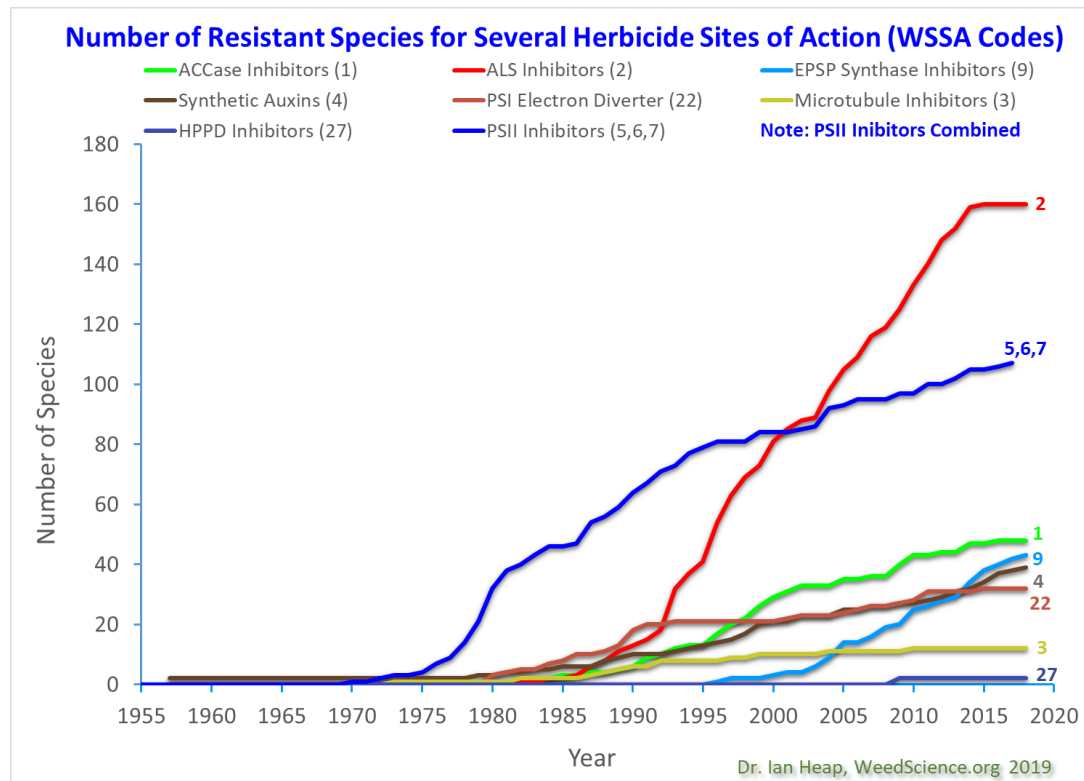
/// Pressegespräch /// August 2020





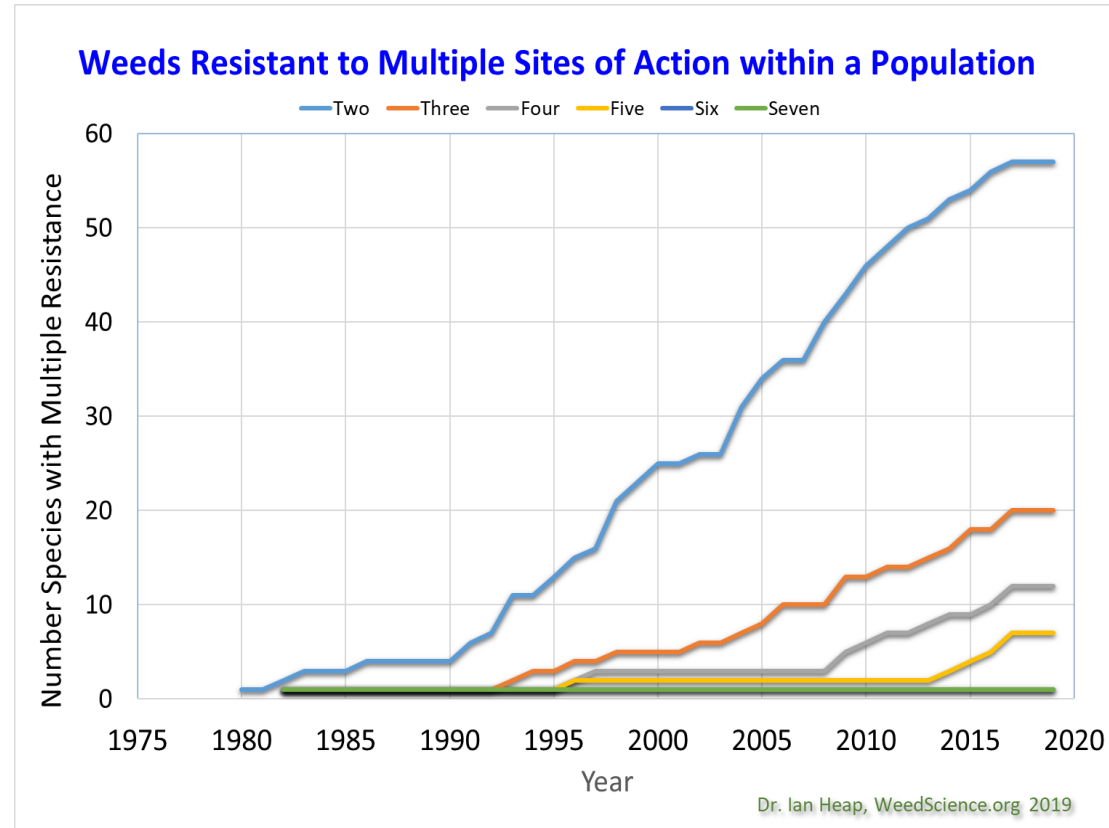


# Herbicide resistance cases are steadily increasing





# Weeds stack herbicide resistance mechanisms

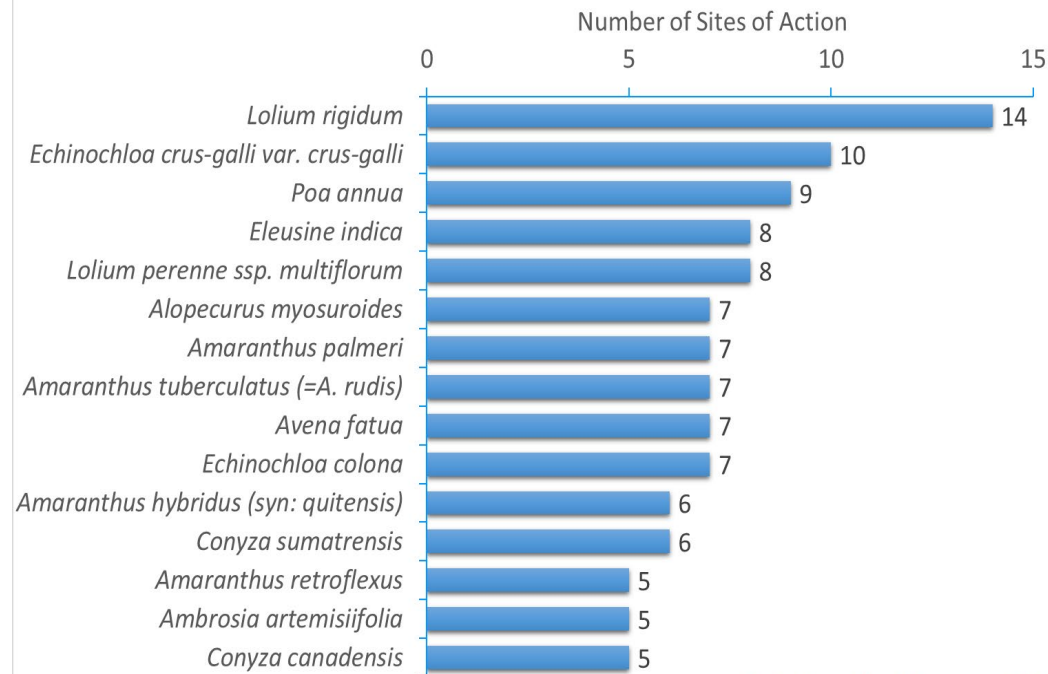




# Top 15 of the words weeds

There are currently **262** different weeds that evolved herbicide resistance.  
Weeds evolved resistance to **23 out of 26 known modes of action** and **167 different herbicides**.

**Weed Species Resistance to Multiple Herbicide Sites of Action**



Dr. Ian Heap, WeedScience.org 2019

## EXAMPLE OF TROUBLESOME WEED: PALMER AMARANTH



CAN GROW UP TO  
**4 METERS**  
IN **1 SEASON**

UP TO  
**5 CM**  
GROWTH PER DAY

EACH PLANT CAN  
PRODUCE UP TO  
**1.8 MILLION**  
SEEDS  
IN ONE SEASON



IN THE PAST  
**15 YEARS,**  
GLOBAL WEED  
RESISTANCE  
HAS INCREASED BY  
**60%**

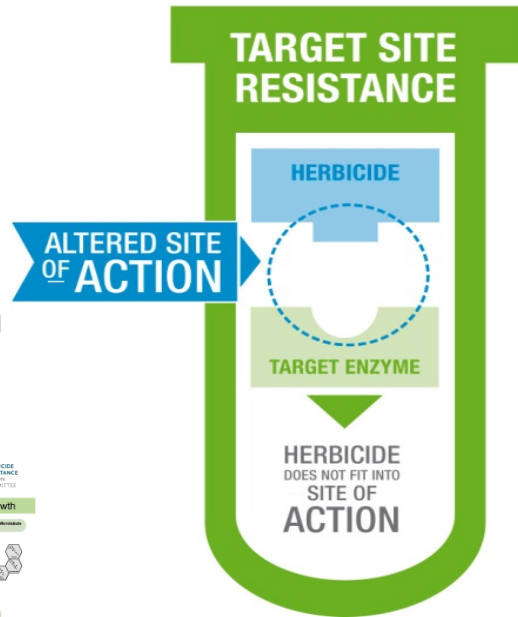
Source: Heap, I. The International Survey of Herbicide Resistant Weeds



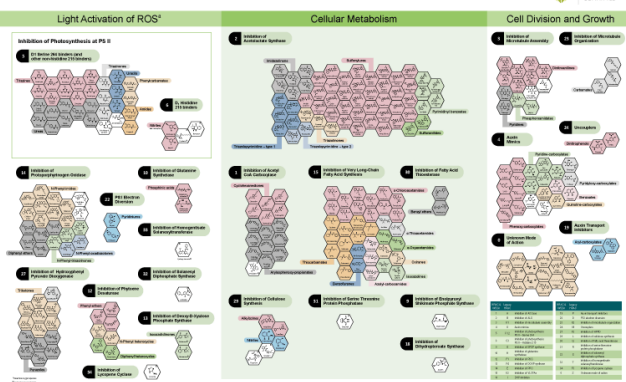
# There are two major types of resistance

Site of action specific

-> change mode of action



HRAC Mode of Action Classification 2020

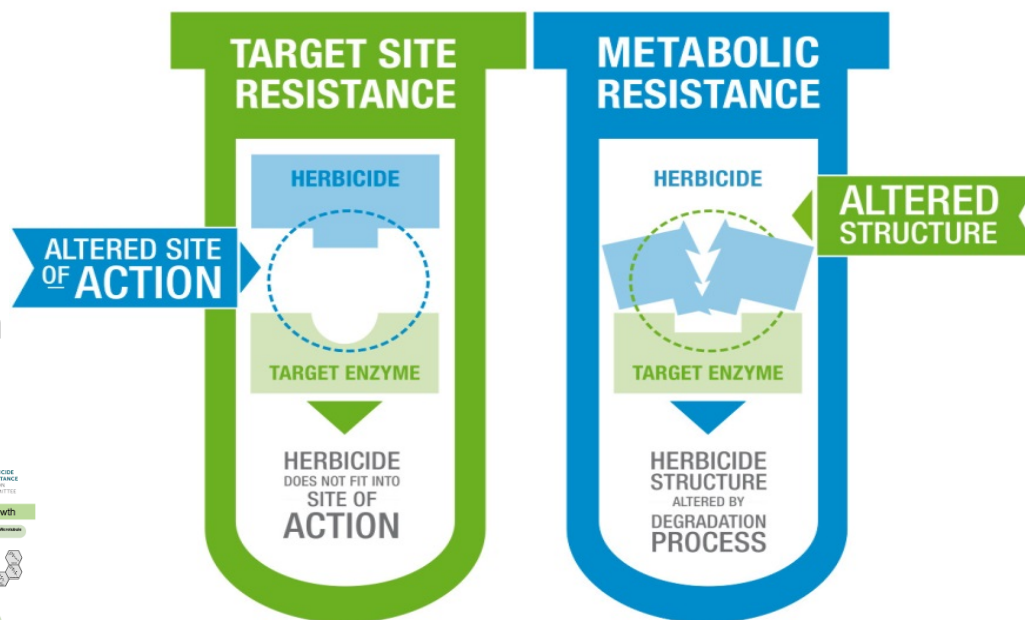




# There are two major types of resistance

Site of action specific

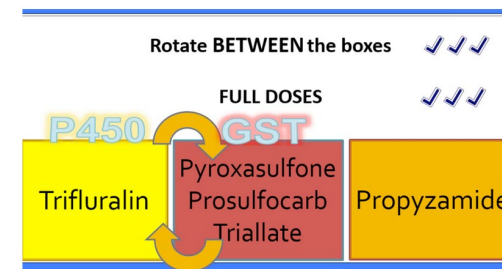
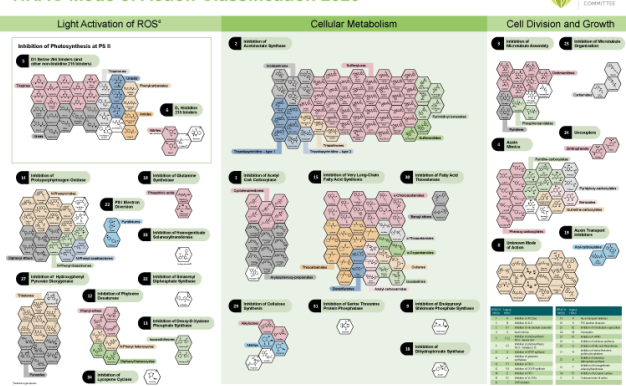
-> change mode of action



Site of action un-specific

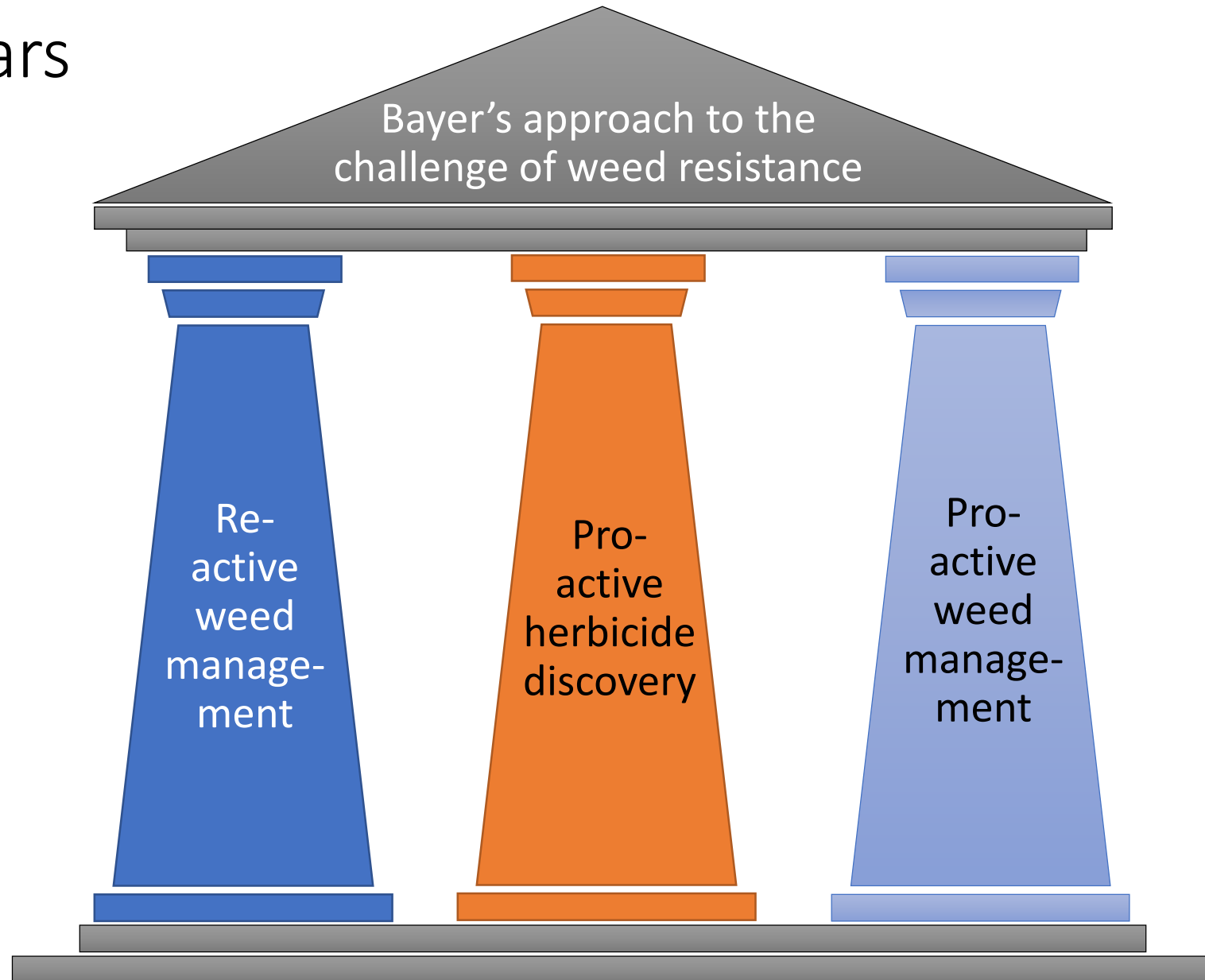
-> change to different chemical structure (can be within the same mode of action)

HRAC Mode of Action Classification 2020





# Three pillars







# 1st pillar: Manage existing resistance cases



- Weed resistance diagnostics
  - Complaint management
  - Characterize resistant lines (WRCC is the only testing center which covers both target site and metabolic resistance routinely)
  - Mapping resistance distribution
  - Understanding newly evolved resistance mechanisms to develop diagnostic markers and countermeasures
- Development of models to manage and reduced the risk of resistance evolution based on
  - the resistance situation in the field
  - the field history



*Tailored recommendations for the farmer to manage resistance*



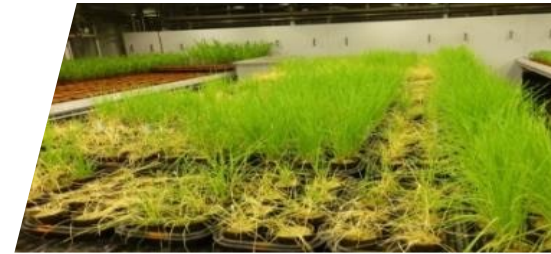


## 2nd pillar: Preventing resistance evolution to new molecules

Pro-  
active  
herbicide  
discovery

- Screen new chemistry on resistant lines
- Understanding resistance mechanisms and how they are being regulated to
  - choose better targets to avoid target site resistance
  - optimize molecules less prone to metabolic resistance evolution

*Bring new resistance-breaking  
molecules to the market*

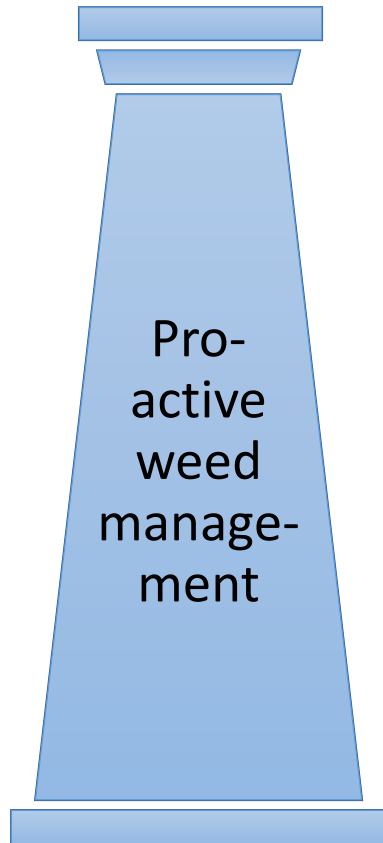


targenomix  
the target identification company





# 3rd pillar: Delaying resistance evolution in the field



- Promotion of sustainable agriculture practices in weed management
  - IWM platforms
  - “It pays off” campaign
  - Stewardship programs
- Modelling scenarios for most successful resistance evolution prevention



*Prevention methods encompassing chemical, biological and cultural methods*



# Summary

Bayer accepted the weed resistance challenge!

- Bayer listened and learned from leading global weed experts about the emerging situation to be informed and prepared early on
- Bayer founded the unique Weed Resistance Competence Center to build and contribute to the scientific understanding of resistance mechanisms and their evolution to stay a step ahead
- Bayer provides high-throughput diagnostic services for farmers to understand their situation in the field and recommend the best solution for their specific situation
- Bayer recommends integrated weed management practices for an agricultural system that is sustainable





*Vielen Dank für Ihre  
Aufmerksamkeit!*

