# Loss of chemistry: Implications for the wheat crop

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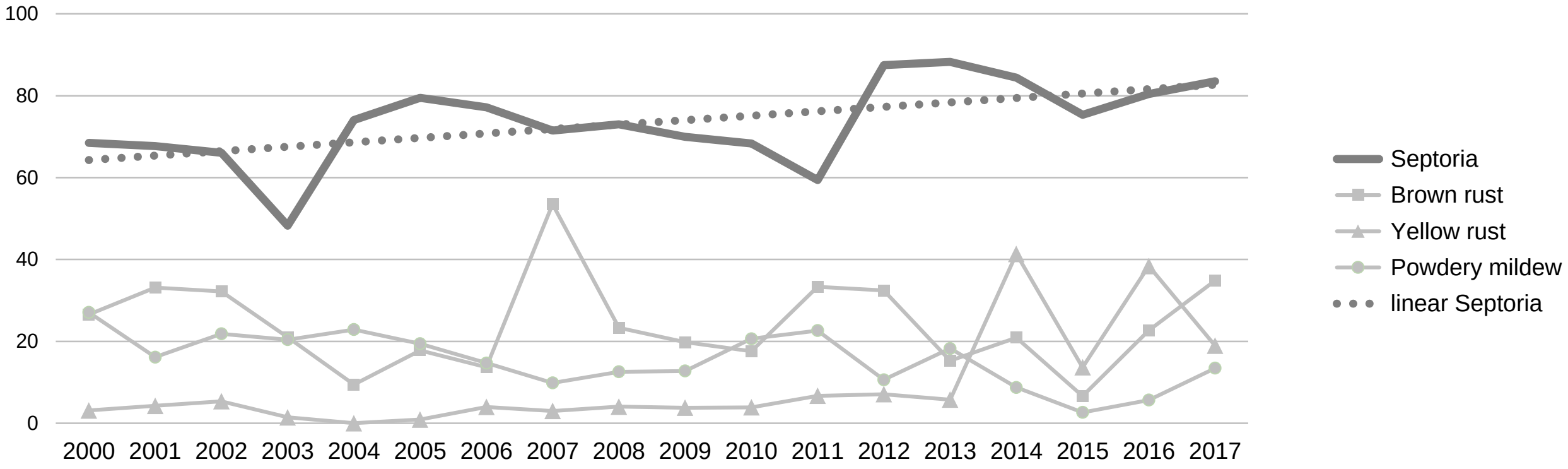
# Key disease occurrence in Europe wheat 2000 – 2017

% of wheat trials in Europe (summary from ~ 8,500 trials)




➢ In Europe **Septoria** with **increasing importance** over time but rust epidemics can be severe

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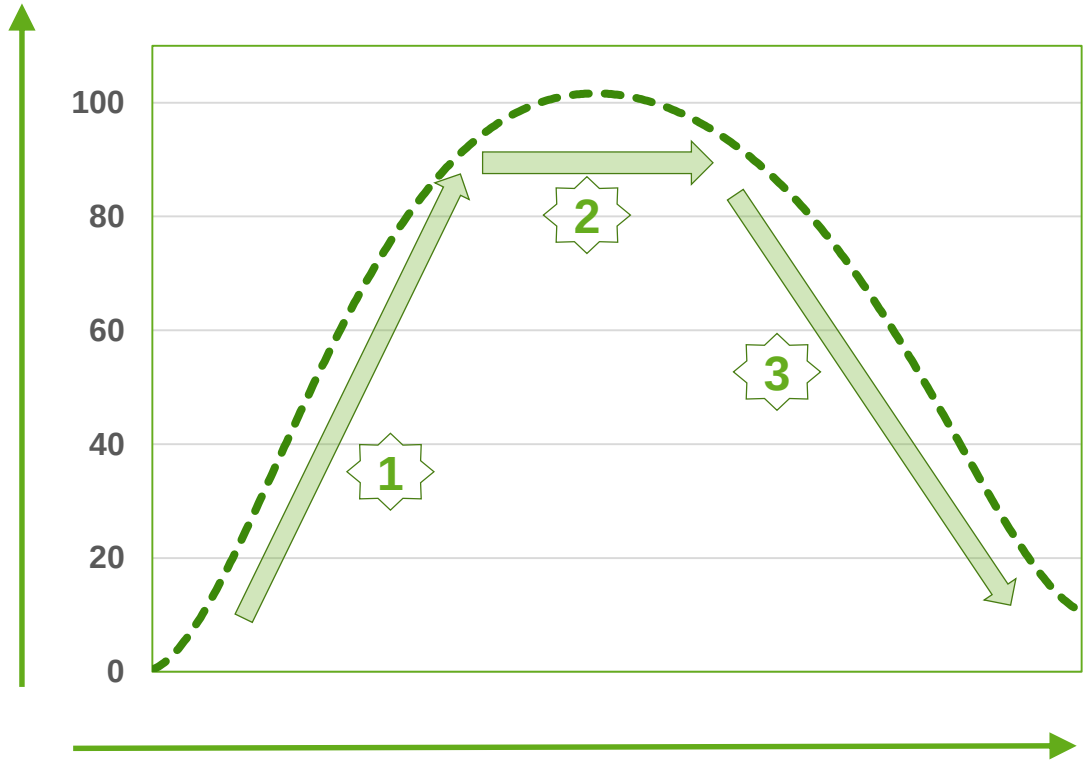
# Life cycle of an active ingredient development




Active ingredient life cycle (time)

1) **Growth**:- achieved through product development, country and label expansion

2) **Maturity**:- consolidation of strong market position to achieve optimal sales

3) **Decline**:- development of new innovations mean that older options are replaced and phased out and/or value declines

➢ Cost of active ingredient development costs ~ € 250 million)

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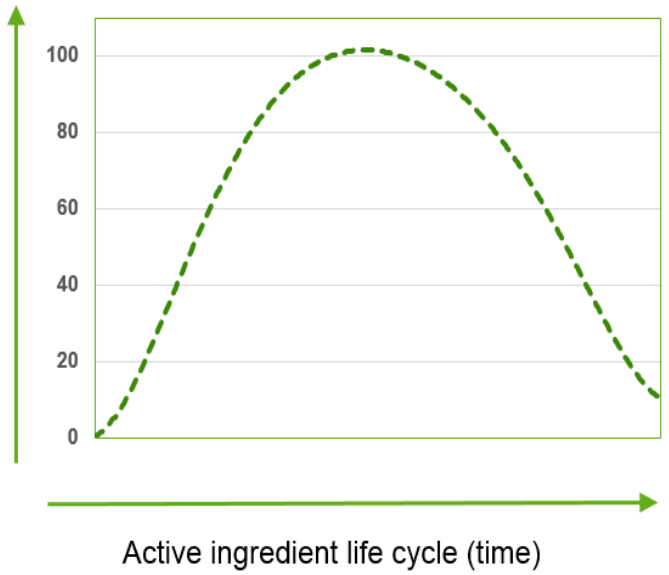
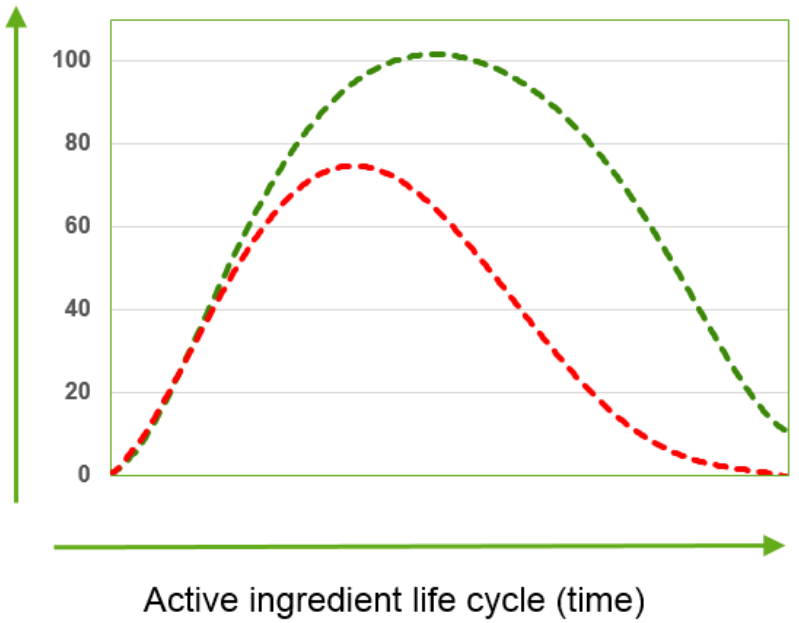
# There are two major threats to the life cycle of an active ingredient
# #1 Impact of resistance over time

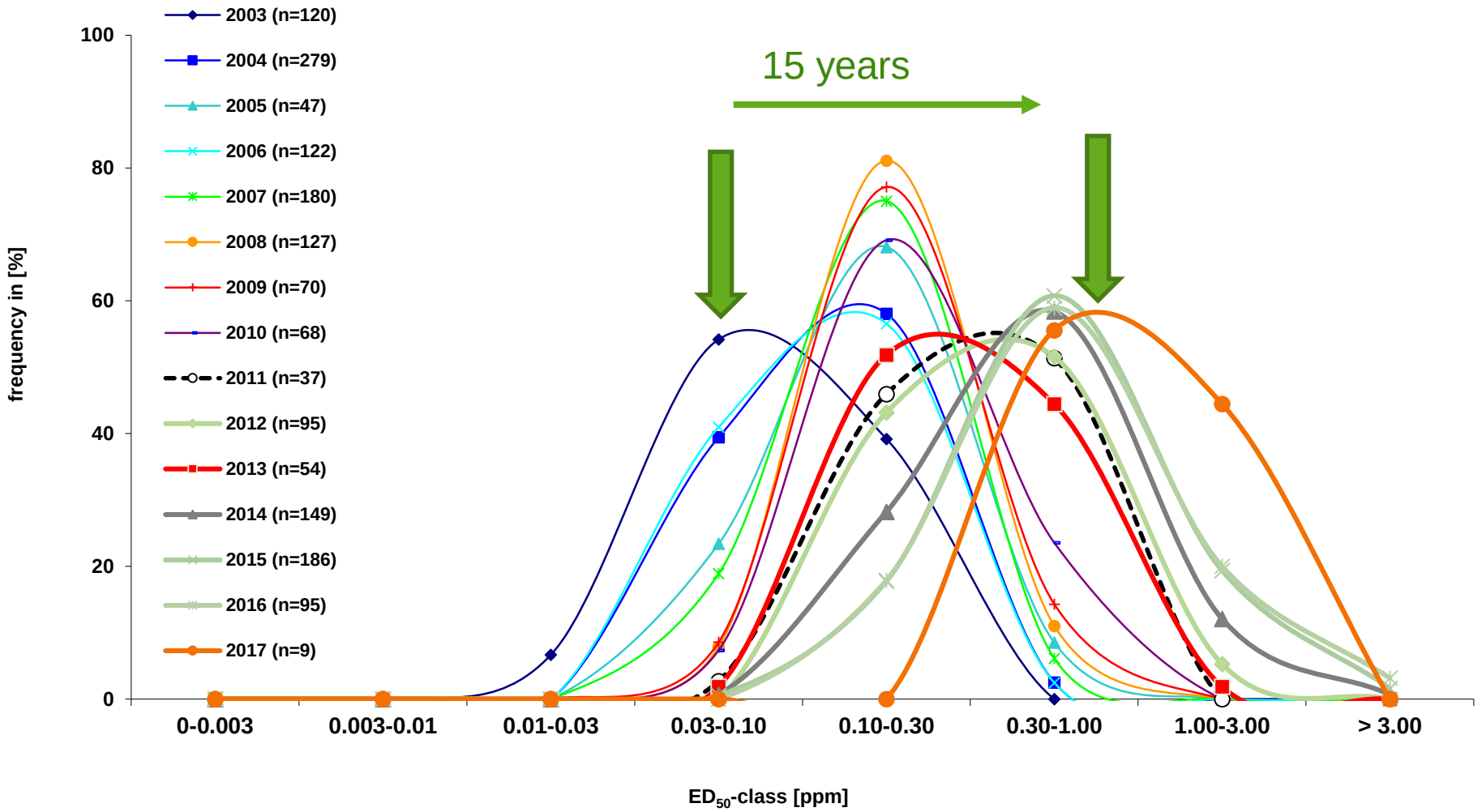



Normal lifecycle of an active ingredient on the market

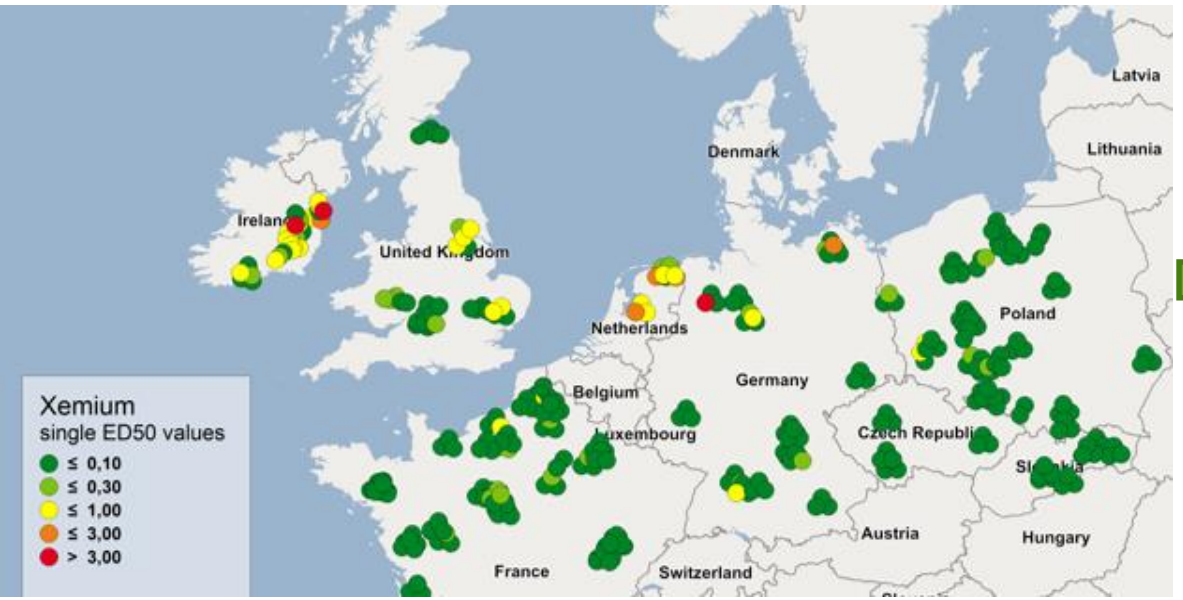


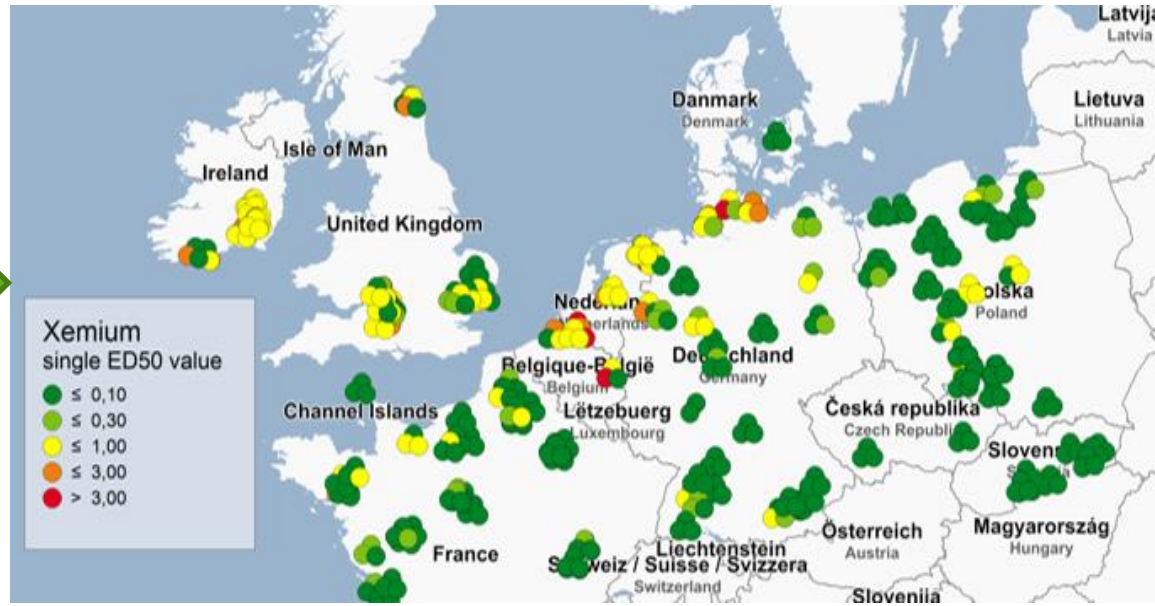

Resistance may reduce efficacy and the availability of solutions on the market

# Example of sensitivity shift of *Septoria tritici* to the azoles in the UK ($ED_{50}$ to epoxiconazle)



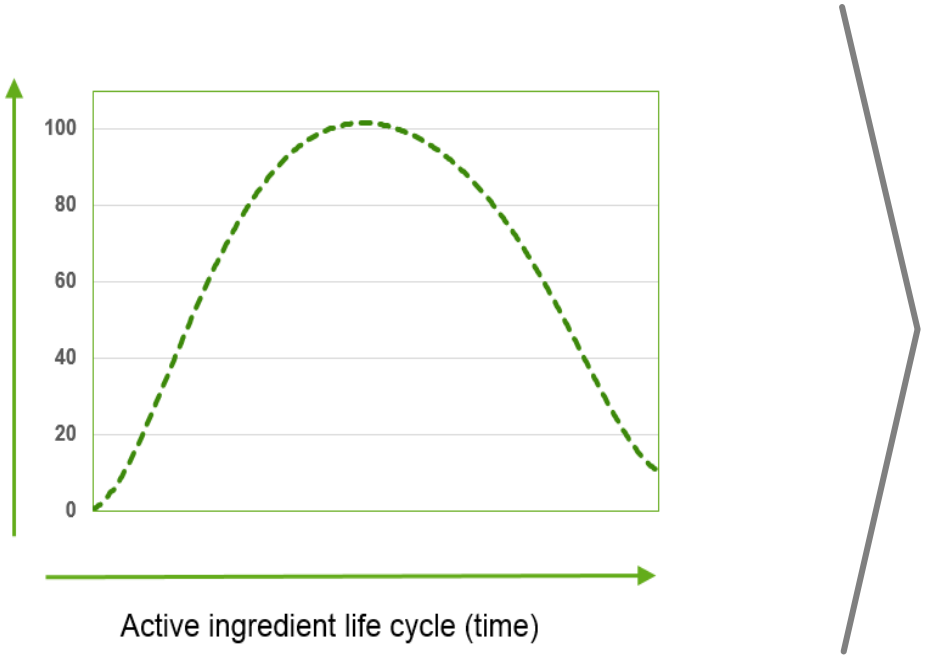
# SDHI routine monitoring of *Septoria tritici* from 2017 to 2018



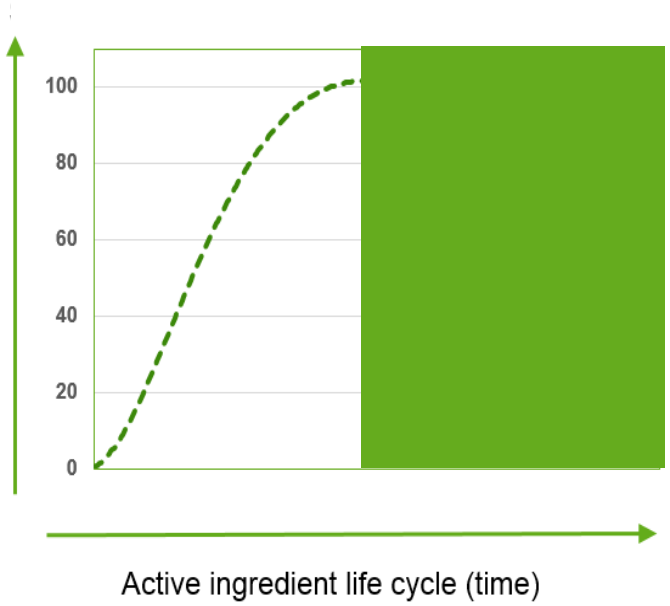




- **Increase in isolates with higher ED50s - higher frequency of moderately adapted isolates**

# There are two major threats to the life cycle of an active ingredient
# #2 Loss of active ingredients due to legislation




Normal lifecycle of an active ingredient on the market




Impact of legislation may mean an active ingredient is removed from the market early

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# EC regulation 1107/2009 adds hazard considerations limiting inclusion of active Ingredients

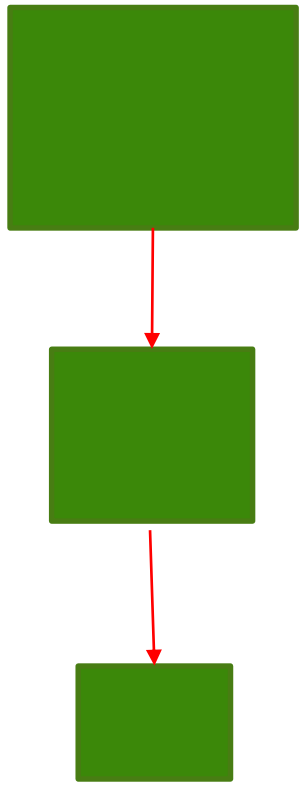
- **Reg. 1107/2009** focuses on hazard rather than risk as an additional criteria for A.S. inclusion, introducing so-called **“Cut-Off” criteria**
- Major concern is that A.S.s that were safe under practical conditions will now be lost
- As an example, in cereals potential major impact on **triazole chemistry** due to “cut-off” criteria

Hazard

Mitigation of the hazard (risk)


Internal

# The number of active ingredients being lost to the market is increasing – innovative approaches are needed



2000 < 900 AI

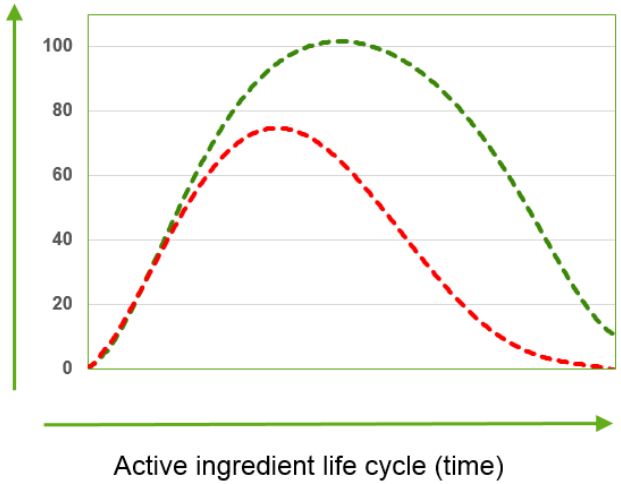
2008 < 425 AI

2018 < 277 AI
(+ 75 biologicals)

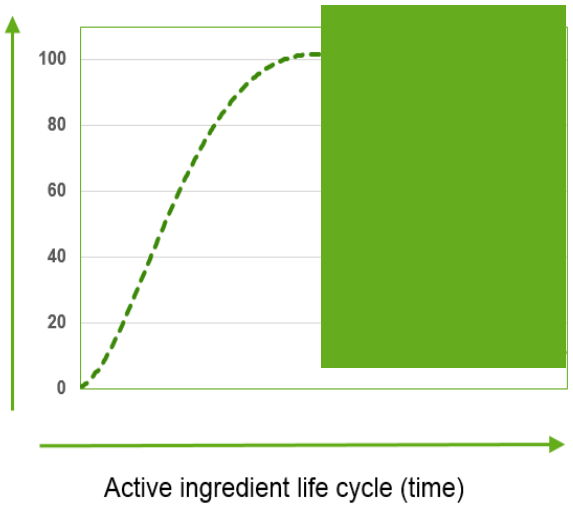
2018 application status
(EU 28 all indications including biologicals)

- New AI applications
  - 12/22 approved
  - 2/22 not approved
  - 8/22 pending
- Re-reg of Ais
  - 32/148 approved
  - 8/148 not approved
  - 20/148 withdrawn
  - 88/148 pending

# Resistance and legislation will reduce the number of active ingredients available to the farmer in the future




**Resistance impact**

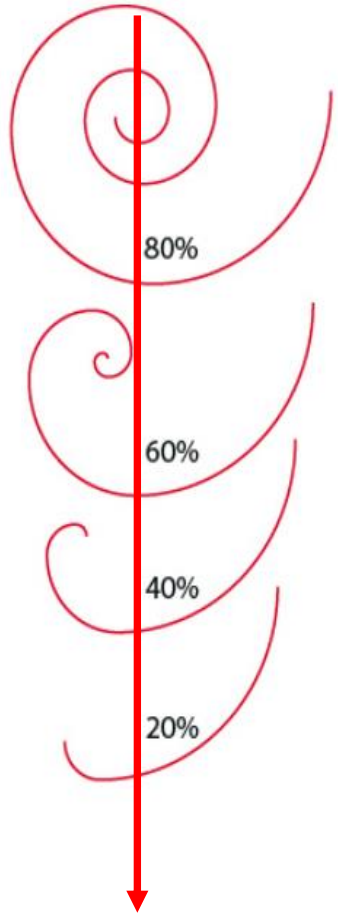



**Regulation impact**

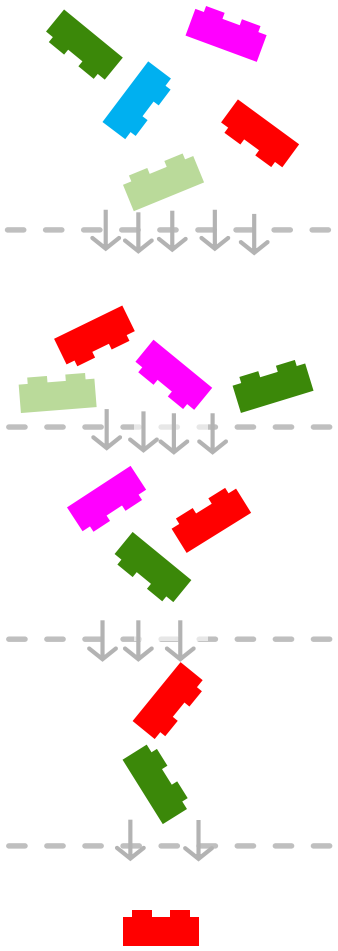
***Decline in Innovation***
(due to cost and legislative pressure)

***Loss of actives***
(due to legislative pressure)

***Decline/Loss of performance***
(due to resistance)



# What does the future hold for wheat production ?



**Regulation** → More tools lost than gained in the relevant time period (2016-2025 ?)

**Crop management** → Lower yields may negatively impact willingness to invest

**R&D pipeline** → Regulatory barriers have increased the hurdles for innovation in EU28

**Tools** → Joint efforts from science to policy to ensure availability of effective tools

**Future?** → **YES**, but agronomic landscape and economic climate will be **very** different

# Collaboration will need to lie at the heart of future crop production