Ragwort in the Netherlands: Can the problem be solved with help from the soil?

Martijn Bezemer
Tess van de Voorde
Ragwort: always been common in the Netherlands but increasing

From: www.vlinderstichting.nl/jakobskruiskruid
Ragwort can be very abundant in nature areas, but...
Abundance varies greatly between areas.
Ragwort in 10 natural grasslands on former arable land

- 5 year old field (1 m height)
- 25 year old field (0.6 m height)

![Graph showing ragwort cover (%) over time (years) since cultivation stopped]

- X-axis: Time (years) since cultivation stopped
- Y-axis: Ragwort cover (%)

- Points indicate ragwort cover at different time intervals:
  - 0 years: 0%
  - 5 years: 40%
  - 10 years: 30%
  - 15 years: 20%
  - 20 years: 10%
  - 25 years: 0%

- Images show:
  - 5 year old field
  - 25 year old field
Soils are full of seeds: up to 2000 viable seeds vs 20 plants per m²

Seedlings establish poor, and particularly in older fields
Long-term field experiment: Sown and unsown plots
Boom-bust pattern strongly reduced by sowing

Ragwort cover (%)

Individual plant biomass (g) in 2002
Ragwort decline in the field can be explained by soil sickness
Soil sickness, probably due to root pathogens (fungi)
Negative soil effects created by ragwort but also by other plant species.
Soil sickness present in most fields but more intense at high density.
Ragwort is a very poor competitor
Why does ragwort abundance decline over time?

- Negative soil effects of ragwort on itself (soil sickness)
- Negative soil effects of other species on ragwort
- Positive soil effect of ragwort on other plant species (help the enemy)
- Ragwort is a poor competitor, even worse in own soil
Ragwort populations maintained due to soil disturbance
How can we deal with the ragwort problem?

Phase I: Increase (action)
- Close vegetation
  (Sowing, species selection)
- Soil inoculation (?)
- Remove ragwort plants (?)
- Avoid soil disturbance

Phase II: Decline (leave it)
- Soil sickness
- Avoid soil disturbance

Phase III: “Normal” density
- Native species
- Important in ecosystems
- Avoid soil disturbance
Control ragwort with aboveground insects?

Phase I

Phase II/III

Stemboring/
Flower feeding moths!
Recommendations:

1) A closed and dense vegetation and avoidance of soil disturbance are the most important measures to control ragwort.

2) After an initial peak, the cover of ragwort in nature areas will decline and, in absence of disturbance, the plant will be marginalized in about 15 years.

3) Ragwort is a native plant that belongs in our nature areas but it has grown out of proportion and should be reduced.