Implementation of Crop Protection Online (CPO) in Poland and Germany

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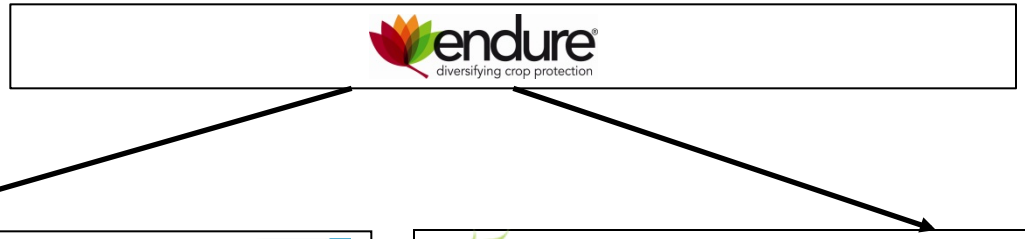
Activities on DSS in ENDURE

- Survey on existing DSS for crop protection in EU + Switzerland:
  - 27 countries
  - 70 DSS in total
  - 9 DSS on weeds,
    'best parts' for reducing use of herbicides were identified

- Report in PDF, 128 pp.
  http://www.endure-network.eu

Activities on DSS after ENDURE



- Integration of 'best parts' from 3 DSS:
  - DecidHerb, Fr
  - GestInf, It
  - CPO, Dk
- New DSS
- Customization for maize in:
  - North-Italy
  - Slovenia
  - South-Germany
- Validation tests begin 2013

- Integration of 'best parts' from 2 DSS:
  - CeBrUs, Ge
  - CPO, Dk
- New DSS
- Customization for winter wheat in:
  - North-Poland
  - North-Germany
  - Denmark
- Validation tests begin 2011

AARHUS UNIVERSITET

South Baltic PROGRAMME

DSSHerbicide

- Main idea:
  - if herbicides can be used according to:
    - conditions on a field level
    - information on economic thresholds
    - information on herbicide efficacy under different conditions
  - the use of herbicides can be reduced significantly without increasing the farmers risk

- Examples:
  - total kill is not required (and not possible!)
  - some weed species can be controlled satisfactorily by herbicides in very low dose rates

Main project activities

- Construction of DSS:
  - common IT system architecture
  - online, interactive tools
  - local weed species, herbicides, calculations, user-interface language, etc.
- Tests of DSS:
  - ‘hands-on tests’ by farmers and advisors
  - validation trials against local ‘best practice’ recommendations

Best parts from CeBrUs
Yield-loss function

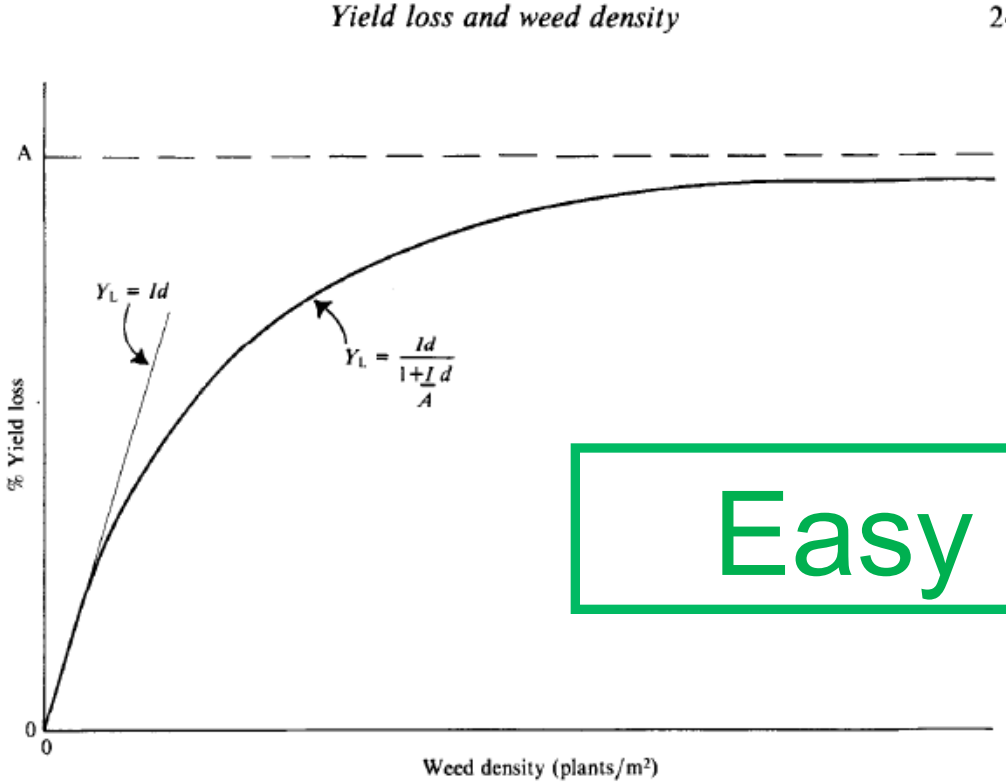


Fig. 1. The rectangular hyperbolic model for relating yield loss to weed density, illustrating its parameters A and I.

Easy work ! ☺

Cousens, 1985

Best parts from CPO
- a 3-step ‘decision engine’

1. assessment of need for weed control

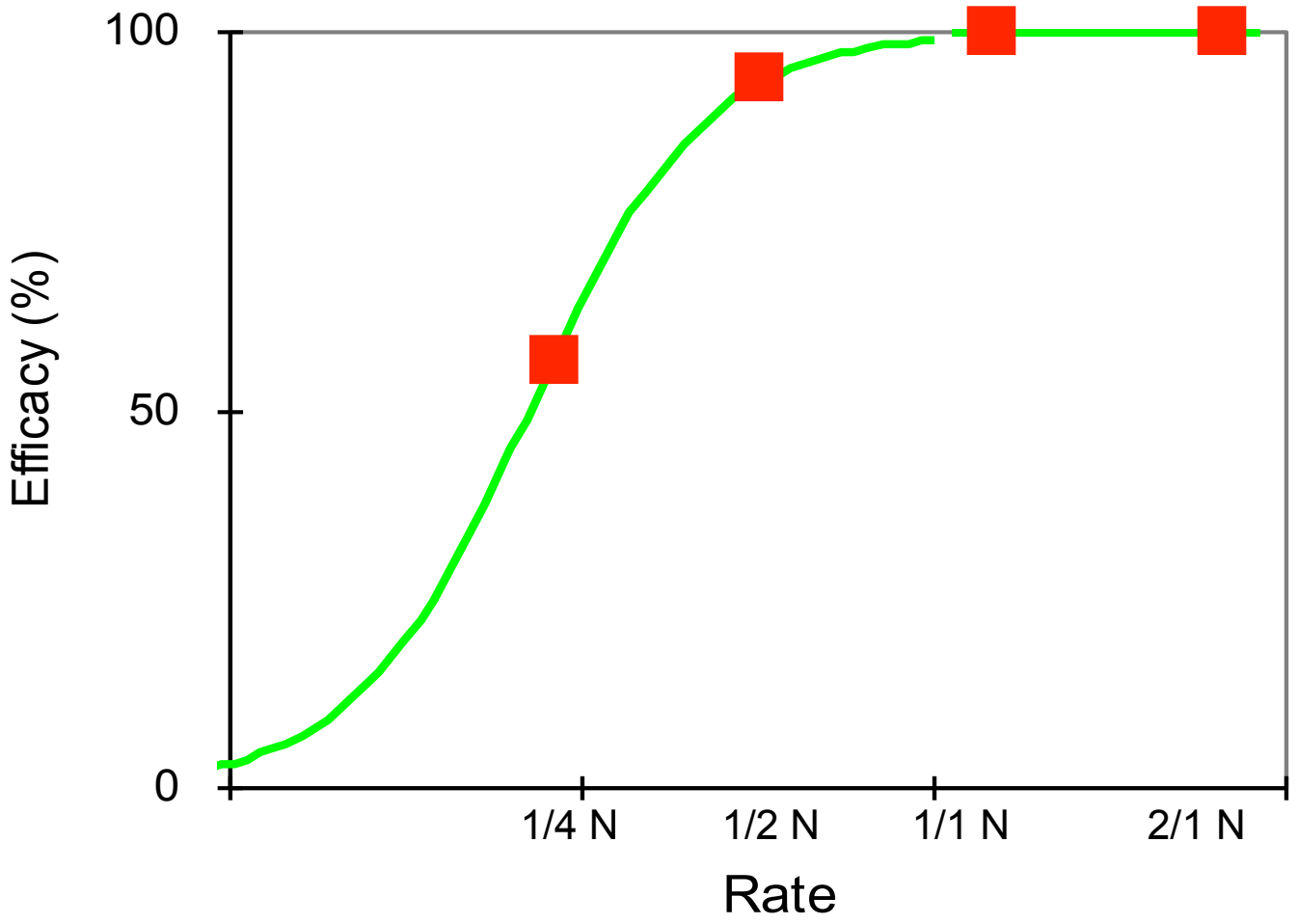
2. selection of single herbicides and calculation of dose rates that match needs

3. optimization of tank-mixtures

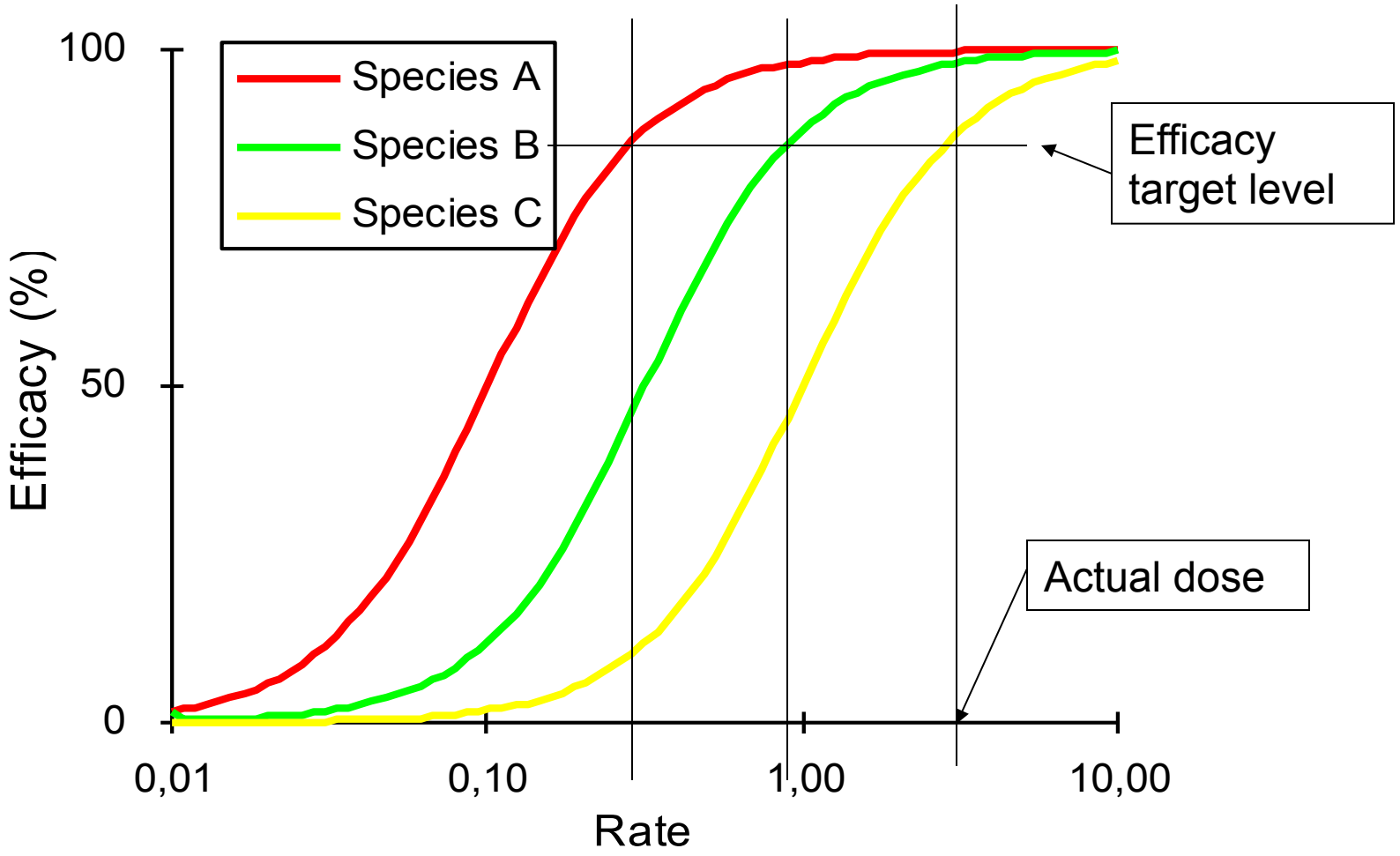
Step 1:
Quantification of need for weed control

- Includes:
  - yield quantity
  - yield quality
  - propagation of weeds
- Based on literature and expert knowledge
- Output:
  - level of control needed
    4-6 weeks after a herbicide application

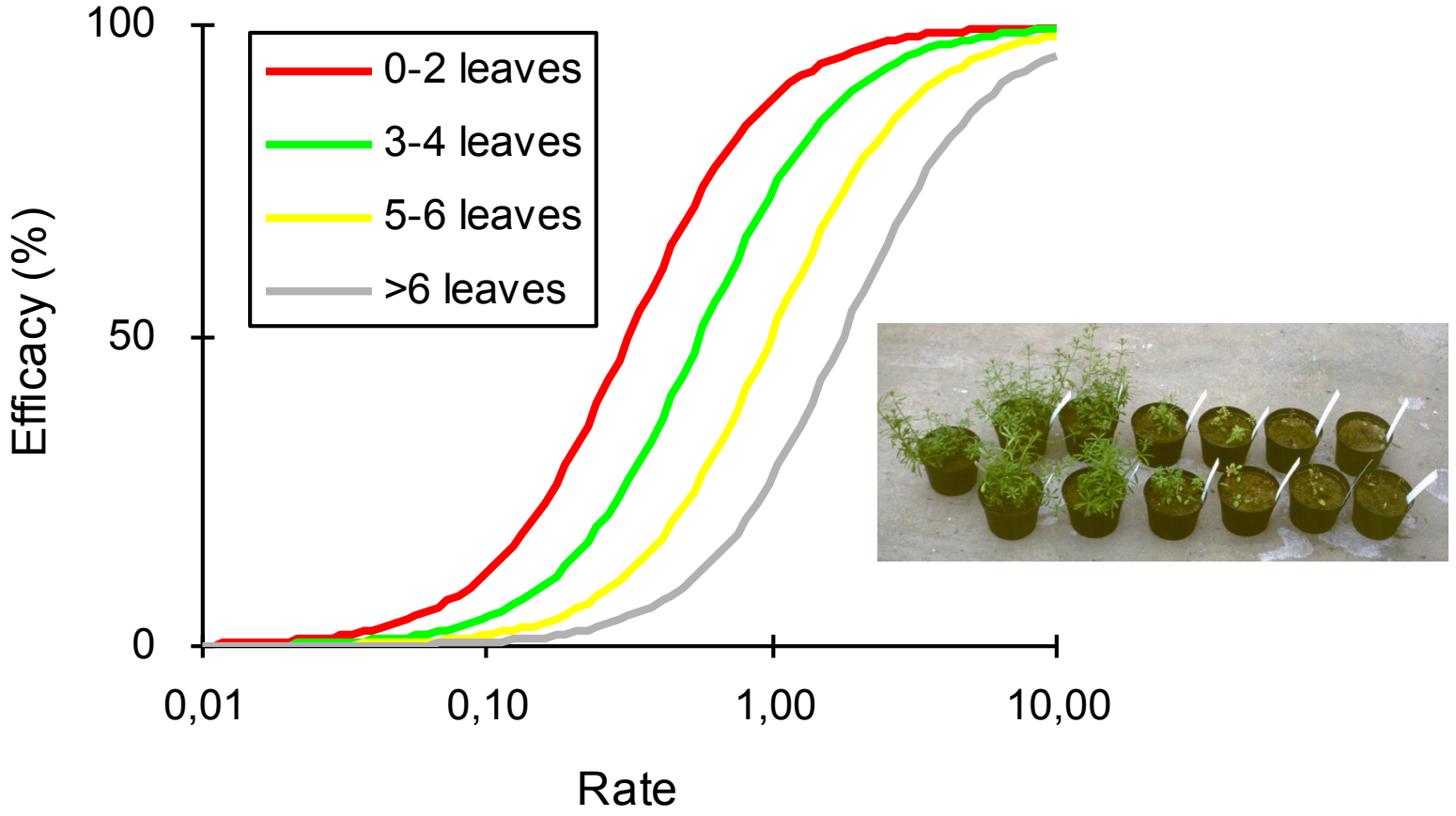
Step 2:
1 herbicide, 1 weed



Step 2:
1 herbicide, 3 weeds

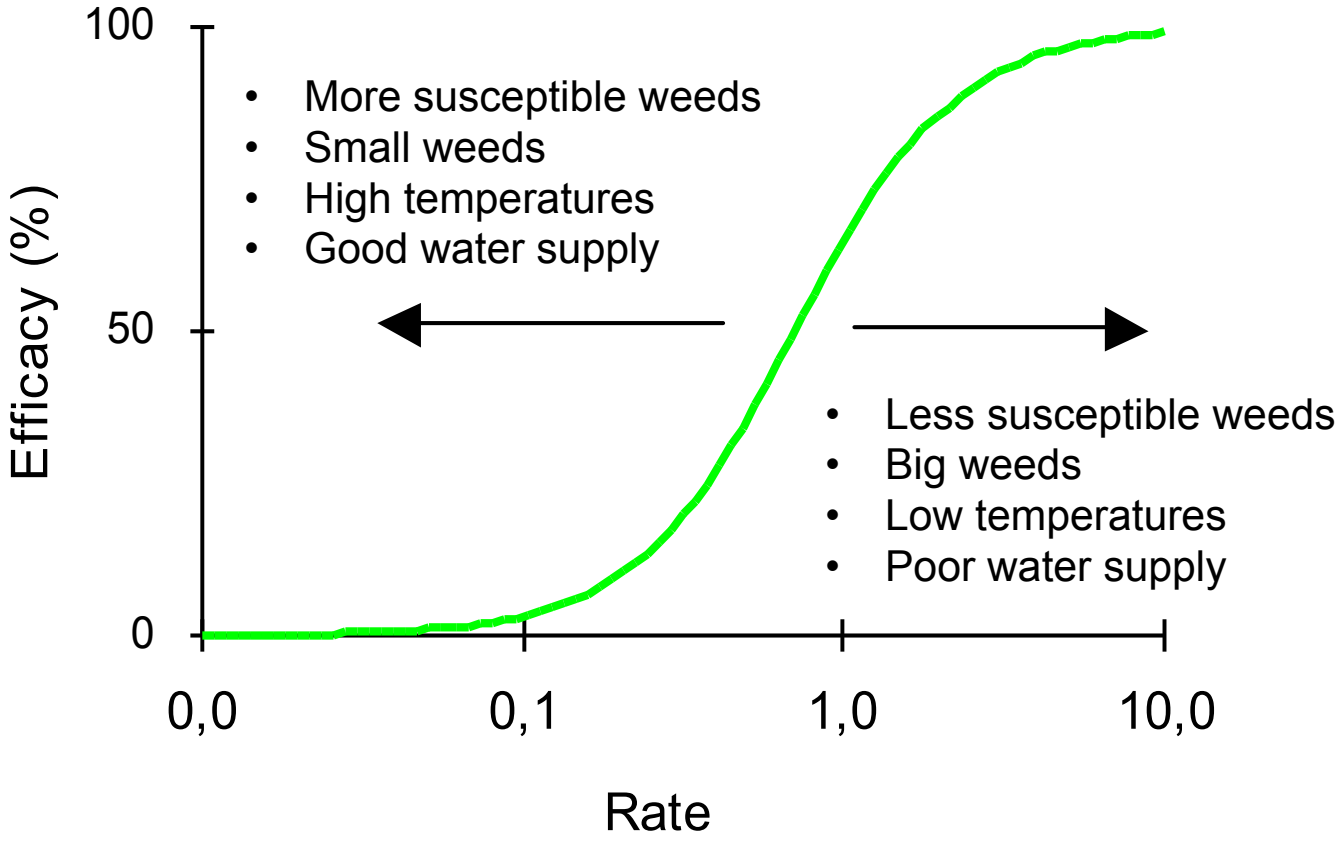


Step 2:
1 herbicide, 1 weed, 4 growth stages

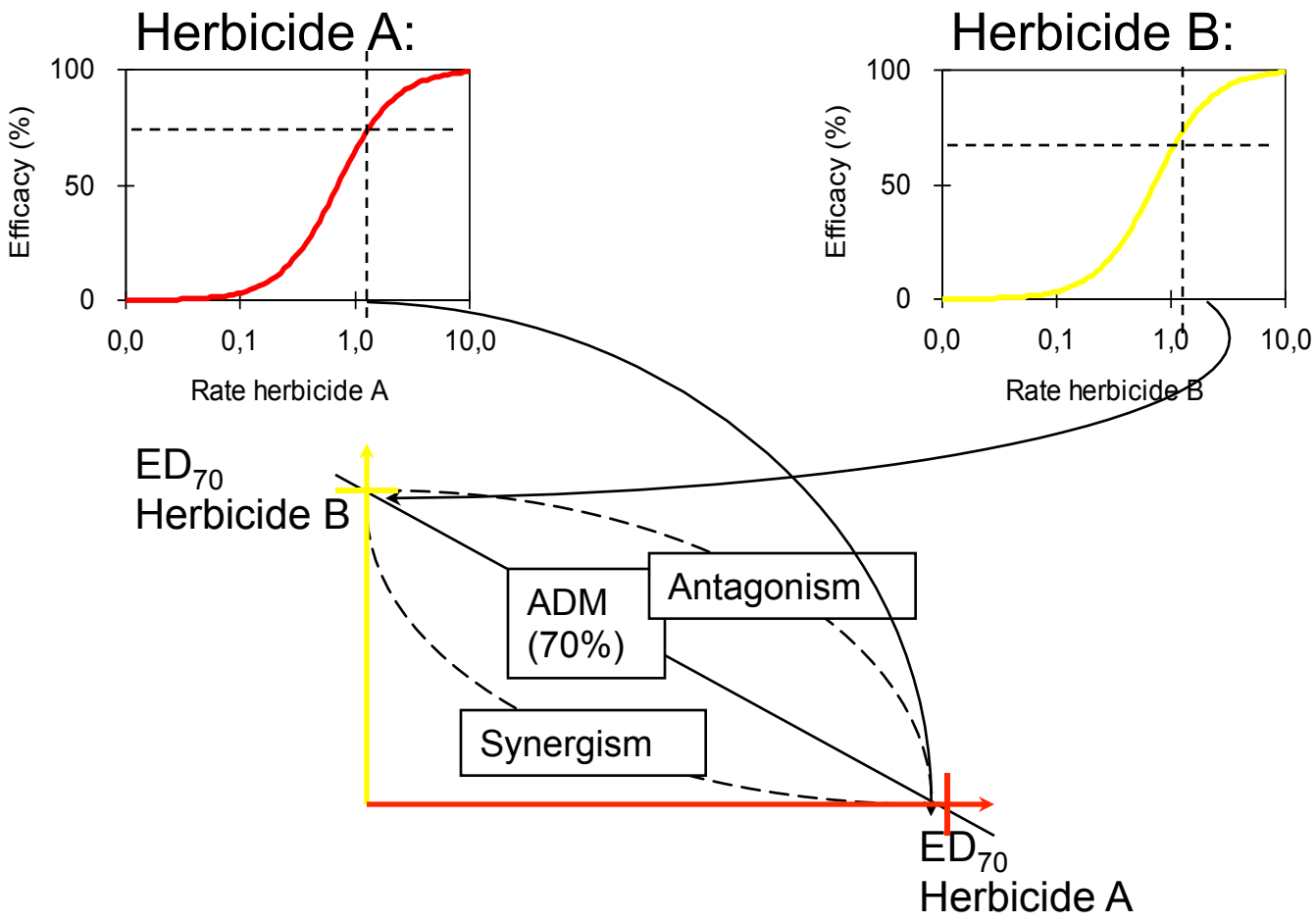


Step 2:
Some attributes of 2 mio. dose-response curves

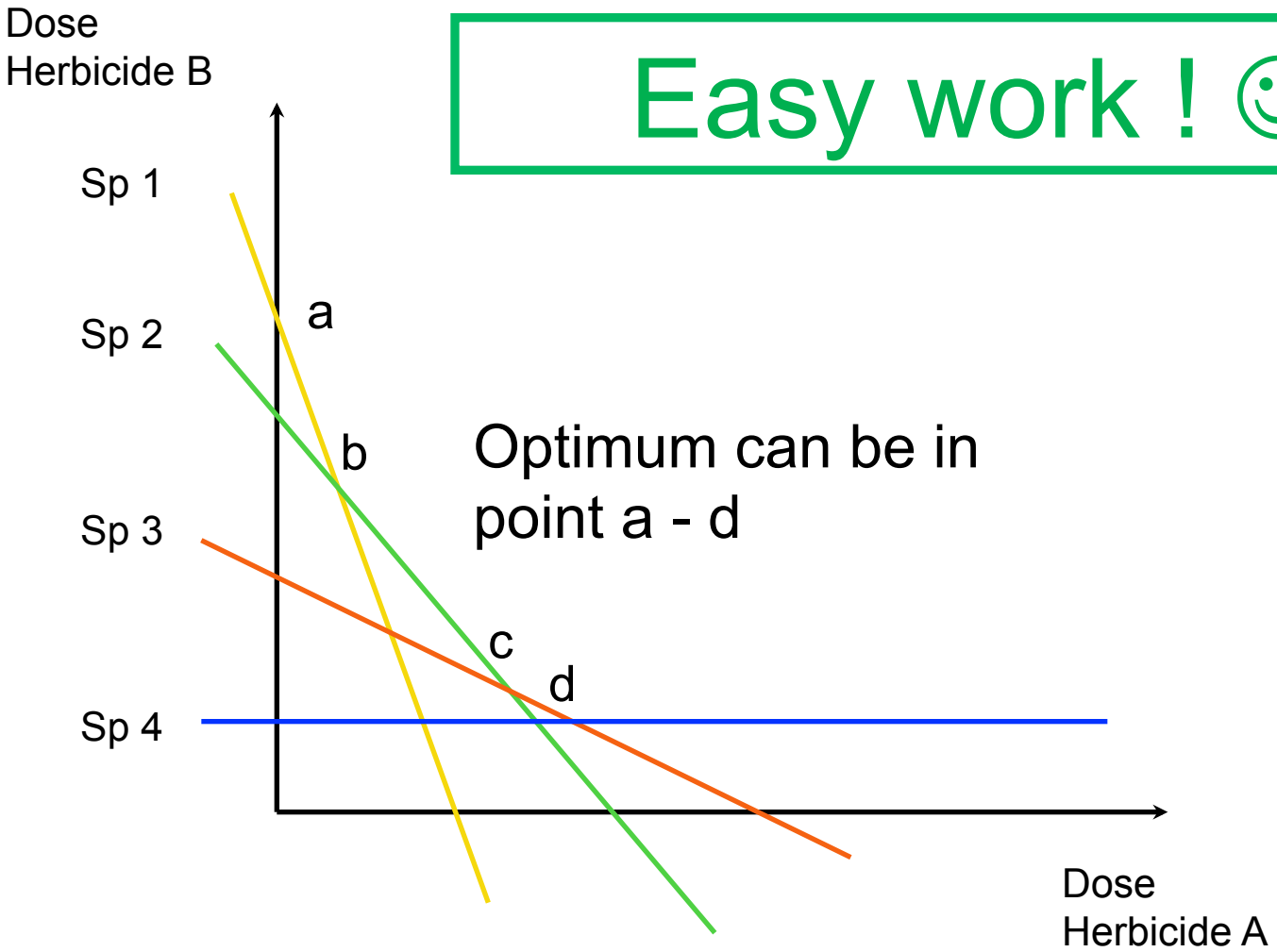
Hard work ! ☹



Step 3:
Optimization of tank-mixes
Additive Dose Model (ADM)



Optimization for cost
2 herbicides, 4 weeds



Easy work ! ☺

Optimum can be in point a - d

Implementation of CPO

- Denmark, since 1991
  - 30 crops, all herbicides, 105 weeds
  - >2,000 field tests show good robustness and 20-40% reduction potential
  - 350 advisors (100%)
  - 800 farmers (3%)
  - In examination criteria
- Norway, since 2003
  - 4 crops, all herbicides, 40 weeds
  - 30 field test show good robustness and about 20% reduction potential
  - Advisors is main group of users
- Main difficulties:
  - Lack of efficacy data from reduced dose rates of herbicides
  - Limited interest among farmers to conduct field inspections

Principles for integration of CPO and CeBrUs

Predicted yield loss from CeBrUs is ‘converted’ into adjustments of needed efficacy levels in CPO

Easy work ! ☺

That’s all !