

The ENDURE IPM Card Game

This document provides information about how to use the ENDURE IPM Card Game, including a printable version of the cards and examples of relevant cases connected to it.

What is the ENDURE IPM Card Game?

A traditional course with lectures, PowerPoint presentations and a majority of one-way communication is not very stimulating for the attendees. The Danish Agricultural Advisory Service has therefore devised a simple card game to be used in training and education with relation to IPM. The game consists of two parts:

- A number of cases with common pest problems
- 20 solution cards with IPM-based potential solutions



The IPM Card Game stimulated discussions among the advisors (Photo: Rolf Thostrup Poulsen, DAAS)

How to play:

- Divide the participants in small groups (3-4 persons is optimal)
- Distribute cases and cards

The game is divided in two rounds:

Round 1: Each group discuss the various solution cards in relation to the problem presented in the case. Highlight to the group, that there is no other solutions than the ones presented in the cards. The group is told to choose the three solutions they think are most important to solve the given problem. If time allows it, they could also be told to prioritize the solutions

Round 2: The solutions are presented by the groups. Pros and cons of the different strategies are discussed, including the connection to IPM.

It is an advantage to give the same case to more than one group, as it opens up for a better discussion about the choice of solutions etc. If the game follows a general presentation about IPM, the game will serve as the practical repetition of the theory behind IPM.

Cards and Cases

On the following pages, the solution cards are presented. Simply print the cards, cut them out of the paper, fold along the central line and laminate.

At the end of this document, examples of cases are provided. It may however be an advantage to adapt these to local conditions, as they are specific for Denmark.

For more info about the IPM Card Game, contact Rolf Thostrup Poulsen (rtp@landscentret.dk) at the Danish Agricultural Advisory Service.



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Solution:
**Seedbed
cultivation**

Weed seeds degrade fastest
on the soil surface.

No cultivation:

- At least 1 month
- Until ploughing



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Solution:
Crop rotation

- Amount of spring crops
- Amount of winter crops
- Other crops?



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Solution:
Weed mapping

Map the weeds in the field.
It will then be easier to
target the weed control in
the subsequent crop.



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Solution:
Harvest strategy

- Avoid spreading by
harvesting problematic
spots last.
- Cleaning of harvest
machinery



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Solution:
Targeted control

- Through monitoring
- Decision support
- Use of the advisory system



Solution:
Monitoring

- Field visits
- Weed maps
- Pheromone traps etc.



Solution:
Soil cultivation

Ploughing reduces the distribution of e.g. grass weeds

- Ploughing always
- Mainly ploughing
- If large weed problems are encountered



Solution:
Forecasting

- By using forecasting systems, the farmer may be informed in due time about potential problems in the field.





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Solution:

Point spraying

Consider:

- Local problem?
- Weed type?
- Will it be cost effective?



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Solution:

Edge spraying

Consider:

- Weeds only in the edges of the field?
- Weed type?
- Will cutting/cultivation/harrowing be an alternative



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Solution:

Reduced dose

Consider:

- Necessary effect?
- Long term drawbacks?
- Does the crop rotation allow a reduced dose?



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Solution:

Mechanical control

Consider:

- Weed density?
- Capacity (machinery)?
- Chemical alternatives?



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Solution:

Fertilization

Consider:

- Is it possible to change the strategy in a way so that the importance of the pest/disease is decreased?



Solution:

Cleaning

Certain pests/diseases/
seeds are spread together
with soil and dust attached
to the machinery.



Solution:

Irrigation

Consider:

- Will irrigation improve the competitiveness of the crop?



Solution:

Sowing

Consider:

- Timing of sowing?
- Plant density?





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Solution:
Crop resistance

Consider:

- Availability?
- Price?
- The wishes of the farmer?



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Solution:
Draining

Consider:

- Will draining improve the competitiveness of the crop?
- Diseases?



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Solution:
Chemical control

The solution is chemistry:

- Best available products?
- Dose?
- Timing?



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Solution:
Prevent resistance

Change between products:

- Mode of action?
- Mixtures?
- From one year to another



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Cases for the ENDURE IPM Card game

The cases provided in this document are specific for Danish conditions, but may be modified for use in other countries.

Case no.	Subject	Description
1	Weeds (Rat's-tail fescue)	You experience increasing problems with Rat's-tail fescue (La: <i>Vulpia myuros</i>) in your winter cereals. You practice no-till agriculture in all fields and have no intentions of returning to use the plough. What can you do to decrease the problem
2	Weeds (Green Bristle-grass)	Years of continuous maize in the same area has lead to a severe propagation of Green Bristle-grass (La: <i>Setaria viridis</i>). A significant amount of plants have escaped the weed control, even though MaisTer (Foramsulfuron+Iodosulfuron) has been applied in the 6-8 leaf stage of the maize. What can the farmer do to reduce this problem?
3	Weeds (Cleavers)	On your part-time farm with only 2 fields and continuous growing of winter wheat for the last 10 years, an explosion in the occurrence of Cleavers has happened in one of the fields. In the other field, barley for malting has been grown in monoculture, due to problems with Italian ryegrass. In the wheat field, primarily Ally (Metsulfuron-Methyl) has been used for weed-control in the spring. What can you do to reduce the occurrence of Cleavers?
4	Weeds (Barren Brome)	You are the owner of a farm which 2 years ago decided to switch to using low-tillage cultivation. In winter wheat fields, a lot of patches with Barren Brome (La: <i>Bromus stirelis</i>) is observed. The problem is largest in the margins of the field, but there are also patches inside the field. The crop rotation consists of winter wheat, spring barley, spinach and, if possible, other special crops. What possibilities do you have to reduce the problem with Barren Brome?
5	Weeds (Loose Silky-bent)	On your farm, with many years of winter cereals, Loose Silky-bent (La: <i>Apera spica-venti</i>) has started to occur in numbers up to 1000 plants per m ² in the fields. 1.5 L Boxer (prosulfoarb) per hectare in the autumn followed by a reduced dose of Hussar (iodosulfuron) in the spring solves the problem. Should this practice continue? And what are the alternatives?
6	Weeds (Common Ragwort)	On your dairy farm, there are problems with Common Ragwort (La: <i>Senecio jacobaea</i>) in your fields with grass. This concerns both pastures and fields for cut. Several of the neighboring fields are left fallow, with a large population of Common Ragwort. What will you have to do to reduce this problem?
7	Weeds (Field Horsetail)	On your farm, Field Horsetail (La: <i>Equisetum arvense</i>) has established itself in large parts of the maize-area. Maize is preferred in the same fields every year. What

		will you have to do to reduce this problem?
8	Weeds (Common Chickweed)	After years of applying SU-containing herbicides, Common Chickweed (La: <i>Stellaria media</i>) has turned resistant. In the field, this has been visualized by the fact that during the last 2 years, the Common Chickweed not being controlled by chemical weed control in the autumn is not being controlled by the normal application of 7 grams of Ally (Metsulfuron-methyl) per hectare in the spring. What can you do to reduce this problem?
9	Weeds (Black grass 1)	On your farm, Black grass (La: <i>Alopecurus myosuroides</i>) has established itself in one field in a 100 m long stripe, where the combiner started in the field last year. You discover this problem in June, when you are inspecting the field together with your adviser. Hand-weeding is not an option. What will you have to do to solve this weed problem?
10	Weeds (Black grass 2)	After 15 years of primarily winter wheat in the same fields, Black grass (La: <i>Alopecurus myosuroides</i>) has become a big problem. The soil type is clay. What will you have to do to solve this problem?
11	Weeds (Creeping Thistle)	On an organic farm, the main weed problem is Creeping Thistle (La: <i>Cirsium arvense</i>). 5 years of organic production has been based on cereals for seed production and Broad Bean. What will you do to solve this problem?
12	Weeds (Scentless Mayweed)	During a walk in your wheat field, you find a population of Scentless Mayweed (La: <i>Tripleurospermum perforatum</i>) somewhat larger than expected. The wheat is at the stage of heading and should have been sprayed in the autumn. What will you do to solve this problem?
13	Diseases (Fusarium)	A farmer you are advising have problems with fusarium mycotoxins in his pig production. In his fields, winter wheat is grown after maize. What will you have to do to help the farmer solve this problem?
14	Pests (Field slugs)	After a production of grass seeds, problems with field slugs (<i>Deroceras agreste</i> , <i>D. reticulatum</i>) are experienced in the following winter wheat field. What will you have to do to help the farmer solve this problem?
15	Spraying technique (Choice of nozzle)	You are about to choose nozzle for autumn control of weeds in your winter cereals. Your main weed problem is grass weeds. Normally you use a pressure of 2 bars 150-200 L water. What nozzle will you use?