

PRACTICAL AND ECONOMICAL ASPECTS OF GRASSLAND MANAGEMENT

AT SOME DUTCH AIRBASES

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Introduction.

In a densely populated country like Holland almost all suitable grasslands are used for agricultural production. There are in Holland hardly no marginal ground or waste land. This intensive management also stretches out to grasslands on airfields.

During the last ten years the number of local birdstrikes is growing mainly because of the strong intensification of agricultural production in Holland.

Intensification of grass-management means:

- increase of use of fertilizers and organic manure
- increase in yields of grass or hay per hectare
- increase in number of cuttings a year
- increase in length of periods with "short" grass.

However, birds are attracted by each single cut and also by the other following agricultural activities. Several bird species, like gulls and lapwings, are specialists feeding themselves on grass-stubble or a field where organic manure is spread. These gulls react even on the agricultural machines as soon as they leave the farm. The trouble some species are so-called "opportunistic feeders". These species make use of every easy feeding occasion. They "hop" from one site to another and therefore cause a high level of bird-flying activity.

The aim of this report is to show the conflict between modern agricultural development, the value of fertile soils, and flight safety measures. Besides preventing "en route"-birdstrikes, the best way to solve this problem is by making airfields unattractive to birds. How a few things are solved and will be solved in Holland on military airfields will be explained with the following example. This concerns Leeuwarden airbase in the north of the country, not far away from the coast. The soil consists of heavy marine clay (40 - 50% clay particles) and the water table is artificially held 1 m below groundlevel. Vegetation mainly consists of *Elytrigia repens*, *Poa pratensis*, *Taraxacum* species, *Dactylis glomerata*, *Lolium perenne* and *Phleum pratense*. On this airbase, grass is mowed for dried grass, silage or hay by local farmers. The surroundings of the airbase consist of pastures and meadows with no arable land. Farmers only have dairy cattle on their own fields; cows are not allowed on the airbase. Only mowing of grass on the airbase is permitted. Five or six cuttings a year are possible. No organic manuring is allowed.

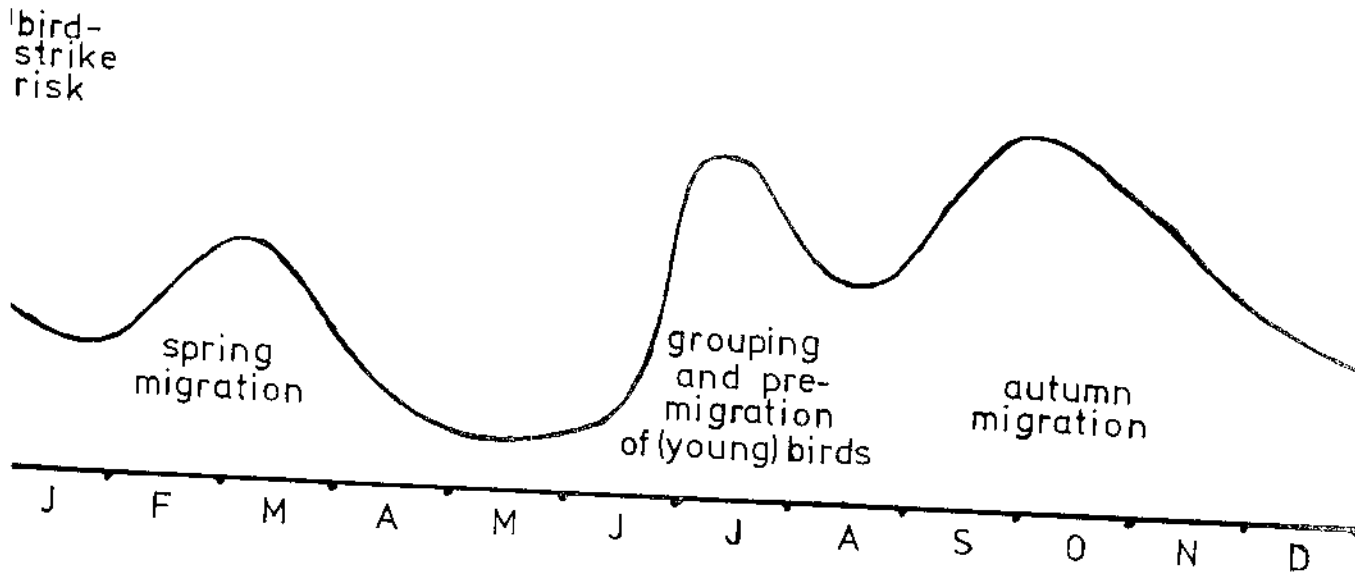
Ornithological aspects.

Most "local" birdstrikes occur during summertime in the months June, July and August, when young unexperienced birds are able to fly and gather on places with much food before migration starts. Also "premigration" from neighboring countries to the food-rich Dutch lowlands occurs. On the other hand, the breeding season is the less dangerous period.

Birds are mostly on their nests outside the airfield. During migration time, suddenly large flocks of birds can alight on an attractive field for roosting or feeding. In a diagram the bird-activity during a year on an airfield looks like:

Fig 1

GLOBAL ESTIMATION OF BIRD ACTIVITY ON AN AIRFIELD



Factors causing attractiveness of the sward for birds.

Every agricultural operation on grassland, like mowing, hay making, ploughing, manuring, can make food available (soil-macrofauna and insects) to birds. Many bird species are mainly specialized on these agricultural activities of human beings (farmers). For this reason it is necessary to minimize these activities on an airfield.

There are indications that high-productive grasslands have a higher absolute number of food possibilities for some common and dangerous bird species than low-productive, extensively used grassland, like twenty years ago, before the increase of fertilizer usage.

The mowed swatch laying on the ground can attract macrofauna during periods of rainfall. After mowing the grass has to be collected and removed from the airfield immediately.

Short stubble after mowing also attracts birds. Birds feel safe because they can look around and easily see coming danger. Birds can also feed themselves more readily on a short stubble. A rich source of food is easily available. Periods with short grass need to be as short as possible and should not occur many times a year.

Grass plants stay in a healthy condition and deterioration of the botanical composition of the sward does not happen, when the first cut in the month May is carried out in the normal way. This means a cut at 5 - 7 cm above groundlevel. Most birds are breeding at that time, so they are either territorial or in the colonies far away from the airfield.

Long grass during wintertime is not recommended. A deterioration of the sward could take place. An optimal length during wintertime of ± 10 cm is proposed.

Measures to reduce attraction of birds.

Measures to reduce bird attraction are:

- slow decrease of all agricultural operations
- keeping periods of short stubble as short and as infrequent as possible especially in the most dangerous parts of the season
- immediate removal of grass after mowing
- mowing of large areas in a short period to have a dispersal of birds and no concentration on small parcels resulting in the movements of birds from one to another.

Practical solution.

A solution for this problem of bird attractiveness is an adjustment of agricultural management. This means not a sudden total change in management. Removal of grass is for several reasons always necessary. Only mowing of grass to a height of 15 - 20 cm above groundlevel with a horizontal rotor mower without removal of mowed grass: the so-called "long grass"-method can not be realized on this fertile high-productive soil in a wet oceanic climate.

Complications, which could occur by using the "long grass"-method, are:

- a sward with an open structure caused by accumulation of debris
- on some places total death growth of the sward
- loss of ability of the turf to bear heavy trucks during a rain period
- constant addition of organic matter can raise new problems
- stimulation of small mammals like mice and voles, which attract birds of prey and herons
- no financial profits
- for military airfields in a grass-area, no camouflage by a differentiated mowing cycle is possible.

Due to these complications we made a new management scheme for this air-base consisting of removal of grass production. Local farmers can cooperate and process the grass for silage or dried grass. Only hay making is forbidden. Total yearly grass production and the number of cuttings a year is lowered by decreasing and maximizing the use of N-fertilizers. N(itrogen) stimulates grass growth and the number of cuttings a year. Possibilities are shown in the following scheme (Fig. 2).

Aspects of the execution.

The following restrictions were proposed and accepted:

- an area 100 m wide running each side and parallel with the runways and on the overshoot areas is mown twice a year
- the rest of the airfield is mown three times a year
- systematic manuring is done early in spring and after each cut except the last one
- grass has to be mowed for the first time just before flowering of grasses to retain a suitable sward composition

- the second cutting, concerning the management with three cuttings a year, has to be done at a height of 10 cm above groundlevel to have a quickly regrowing sward
- at the end of september the last cut has to be carried out.

Finally, some economical aspects concerning 150 ha grassland are shown. A comparison is made when the whole area is extensively (2 cuttings a year) and intensively (4 - 5 cuttings a year) used. In all cases, a positive benefit is possible, but the benefit by an intensive management is \pm 50.000 Dutch guilders higher being the same as the cost of one birdstrike.

Fig 2: GRASS GROWTH IN RELATION TO FERTILIZATION

