About effects of agricultural and grassland use on airfields - reducing bird populations

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Bird populations in all regions of Europe depend - in quality (species) and quantity (frequency) as well as in appearance on various parameters of ecological manner and of human use. The number of birdstrikes correlates with these parameters. Under unfavourable ecological conditions, f.i. poor soils without any small animals and without intensive grassland use, the bird population will be low, the birdstrike risk, too. Under favourable ecological conditions, f.i. soils which are rich in small animals(food for birds) and permanent used by mowing grass, the bird population and birdstrike risk will be high. Under these conditions reduction of birds can only reached by changing the ecological background, by changing the type of use and/or by scaring birds with pyroacoustic and electroacoustic installations, but these last mentionned methods proved to be not so effective. Therefore the ecological way will be the best always.

It is well known that agricultural use on airfields is attractive for birds (small birds like sparrows,finches, but also pheasants,partridges,crows,pigeons and gulls) especially during harvest- and sowing-periods; it is well known that sheep grazing or something like that favours bird appearance and moreover we know - many years observations in U.K. and Germany showed it - that long grass is not so favourable for birds as permanent short grass.

Since more than 10 years in German Air Force Airfields corresponding investigations and observations were made. Some investigations are going on at the moment, the planning is over 4 further years in various regions under different ecological conditions. But some results as to the effectivity on birdstrike number can be demonstrated.

1. Sheep-Grazing

It was done on more than 10 German Airfields until 1970. The consequence : airfields with sheep had a relative birdstrike

number of 15.0, airfields without sheep grazing only between 5.0 and 8.5. After prohibition of sheep grazing (1970) the number of birdstrikes decreased conspicuous, but another problem was coming up : the type of cutting grass hitherto done by sheep had to be changed. Therefore the most airfields decided to cut grass by permanent mowing. The consequence : development of large organic layers on the soil which were very favourable for small animals like larvae and myriopodes, a good food for birds and a good substrate for breeding. Moreover, by sheep grazing the soils were condensed so that precipitation was not able to run away. The consequence : large areas were falling moist and wet, other species of birds appeared, the permanent mowing became more difficult. So other possibly combined methods of handling/using grassland had to be found.

2. Grassland - Handling

At grassland-handling it must be differed between the extensive and the intensive method. Simplified we can say that the first method consists in a mowing from time to time (2-3 x per year) with clearing the grass and the second method in a permanent mowing with or without clearing the grass. Another type of extensive grassland-handling is the use of growth prohibiting substances.

More years observation and statistics show a verry narrow dependency and relation between birdstrike risk, birdstrike number and methods of airfield use.

3. Statistics

Since 1967 (Fig.1) German Air Force had a decreasing number of birdstrikes at take off and landing within the direct airfield areas. That positive result could be reached by using combined methodes of bird scaring, that means agricultural/ecological and technical methods. But still more important is the fact that number of hazardeous birdstrikes decreased during the same period although the number of movements and flight hours increased between 1967 and 1976.

The statistics show(Figure 2) that coastal airfields have

by ecological reasons a higher quantity of birds than highland airfields. Therefore without provisions scaring birds the coastal airfields would have the highest number of strikes. Nevertheless figure 2 shows that it is possible to reduce birds in such airfields in case a corresponding(regarding the ecological background) method of grassland handling can be developed. So in the first years the grassland was mowed nearly monthly, the consequence : a large population of gulls, oystercatchers and starlings during all seasons, a high number and a high rate of birdstrikes. Reducing number of mowingtimes from 1968 until 1970 led to a decreasing number of strikes, the mowed grass was removed. In 1971 a test was made by 6 times mowing, the result was clear. Since 1972 the grassland procedure for this airfield with very poor soils ,on which growth prohibiting substances are not favourable is to mow two time the year with removing the material. The birdstrike number and rate during those years was 0; in 1976 there happened 1 strike, induced by a small bird - without damage.

Another example : an airfields in NW-Germany amidst a pasture landscape in the surrounding. Also on this airfield permanent mowing led to an increasing of lapwing and gull as well as during special periods starling population. The best results as to the birdstrike number could be reached by using growth prohibiting substances(Fig.3) MH 30 , but because of the type and nutrient situation of the soils it is only possible to use this substance for 3 years maximum. The figure 3 shows that mowing always led to an increasing birdstrike number. Bird observations on the same airfield showed that quantity of birds decreased in years with use of MH 30 because of the longer grass. The same happens in years with two times cutting with removal of grass.

In figure 4 there is presented the birdstrike statictic of an airfield with large agricultural use in the surrounding and a high fertility of soil. A permanent cutting - 6 - 8 x per year - favours appearance of birds especially lapwings, starlings, pigeons,crows and hawks because of quantity of

small animals in the soil which could develop by the not removed grass-material. Using the growth prohibiting substance MH 30(Malein-acid-hydracide) together with mowing (late autumn or early spring as a cleaning mowing) the bird population could be reduced and number of birdstrikes decreased; birds migrated back into the agricultural areas for food. The picks in 1970 and 1972 had to be traced back to the fact that one part of the airfield (100 ha) along the runway was mowed all over the year and the other part(100 ha along the runway) was mowed only two times the year. For this airfield in western German area the best method consists in using MH 30 for 3 years, than one year with two times mowing with the aim to recover the grass from this chemical substance. Generally it should be regarded that use of MH 30 is dependent on soil fertility and density of grassland-species. In order to find out the best intervalls it always will be necessary to test out this substance and its concentration regarding soill and precipitation.

The last figure 5 shows the situation on an airfield with strong agricultural use.The bird population consists on crows,pigeons, starlings and hawks. More than 200 ha are in cultivation , and that wheat, rye, oats and barley. There seems to be a difference between years with cultivation of wheat and rye as well as with oats and barley as wheat and rye are preferred by birds. The second difference is between cultivation corn or root vegetable like potatoes and rape. Root vegetable seems to be more attractive for pigeons,gulls and crows, corn attracts small birds and crows as well as hawks. This may declare the difference in the figure 5: many birdstrikes in years with cultivation of corn, fewer strikes in years with roots. The relative numbers of birdstrikes from 1974 until 1977 show the same.Since 1 year the agricultural area has been reduced for more than 90 %, the number of birds decreased as well as the number of birdstrikes.

4. Summary

Agricultural and intensive grassland use favour quantitity of birds and can induce birdstrikes on airfields. The results presented in this paper should be seen also under the viewpoint that besides special ecological provisions - use of grassland,

use of chemical substances, change of vegetation-type and -form - also technical provisions were carried out, but comparing the results reached by technical and/or ecological procedures it must be stated that the ecological way seems to be the best for reduction of bird populations as well as for elimination the birdstrike risk.

FIG. : 1

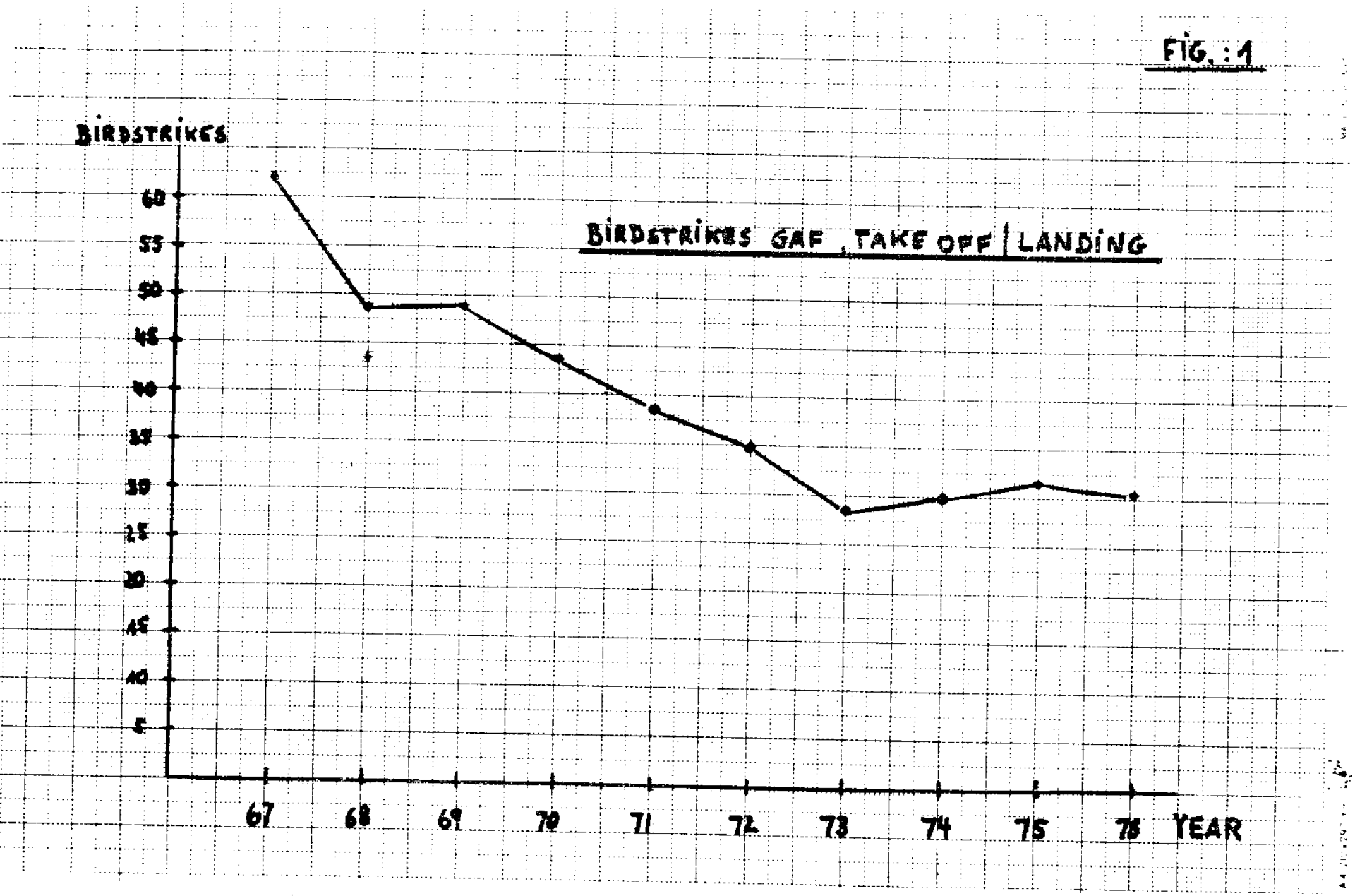

BIRDSTRIKES
BIRDSTRIKES GAF, TAKE OFF | LANDING
60
55
50
45
40
35
30
25
20
15
10
5
67
68
69
70
71
72
73
74
75
76
YEAR

Fig. 2

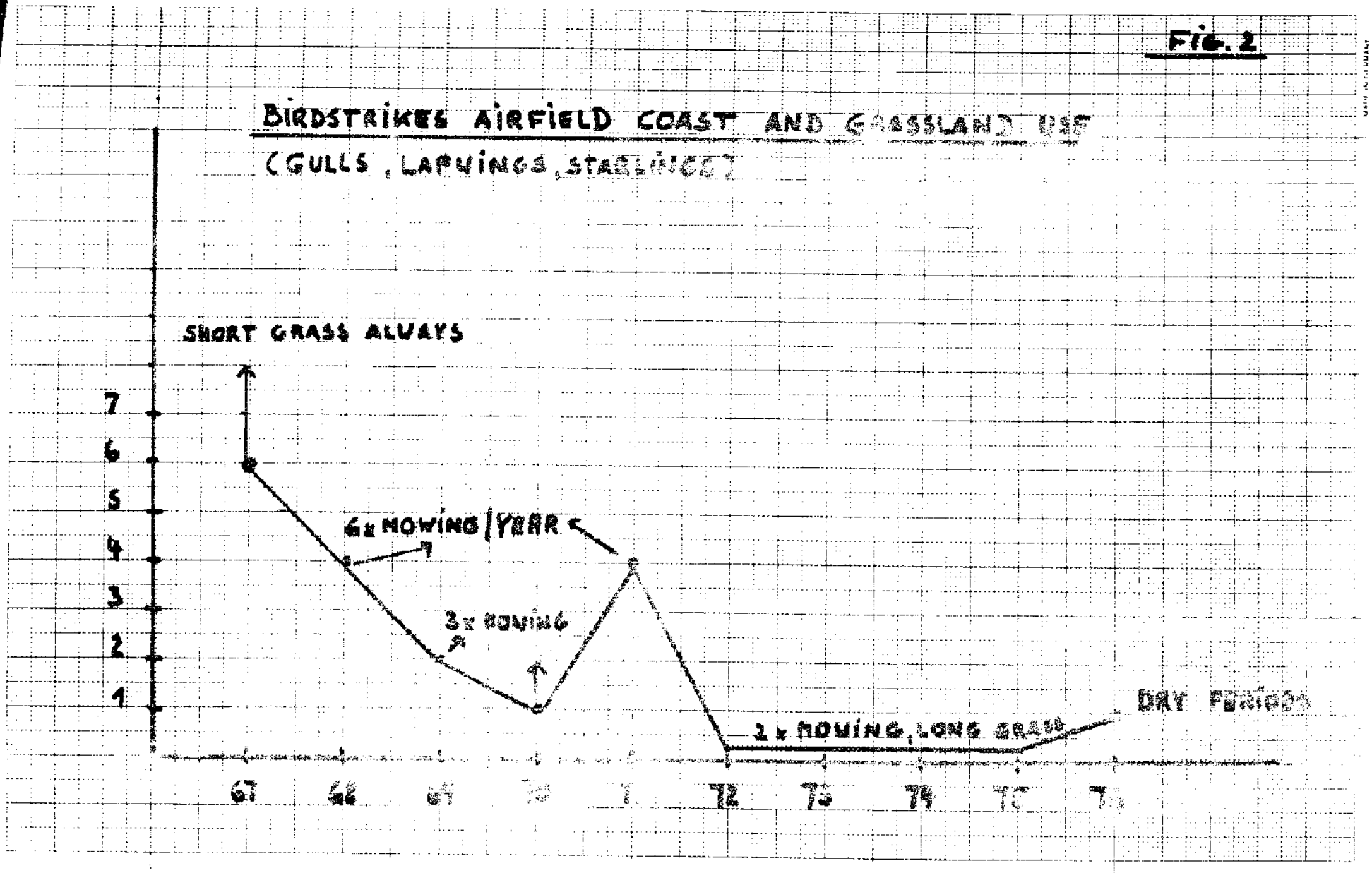

BIRDSTRIKES AIRFIELD COAST AND GRASSLAND USE
(GULLS, LAPWINGS, STARLINGS)
SHORT GRASS ALWAYS
6x MOWING/YEAR
3x MOWING
2x MOWING, LONG GRASS
DRY PERIODS
7
6
5
4
3
2
1
67
72
73

FIG. 3

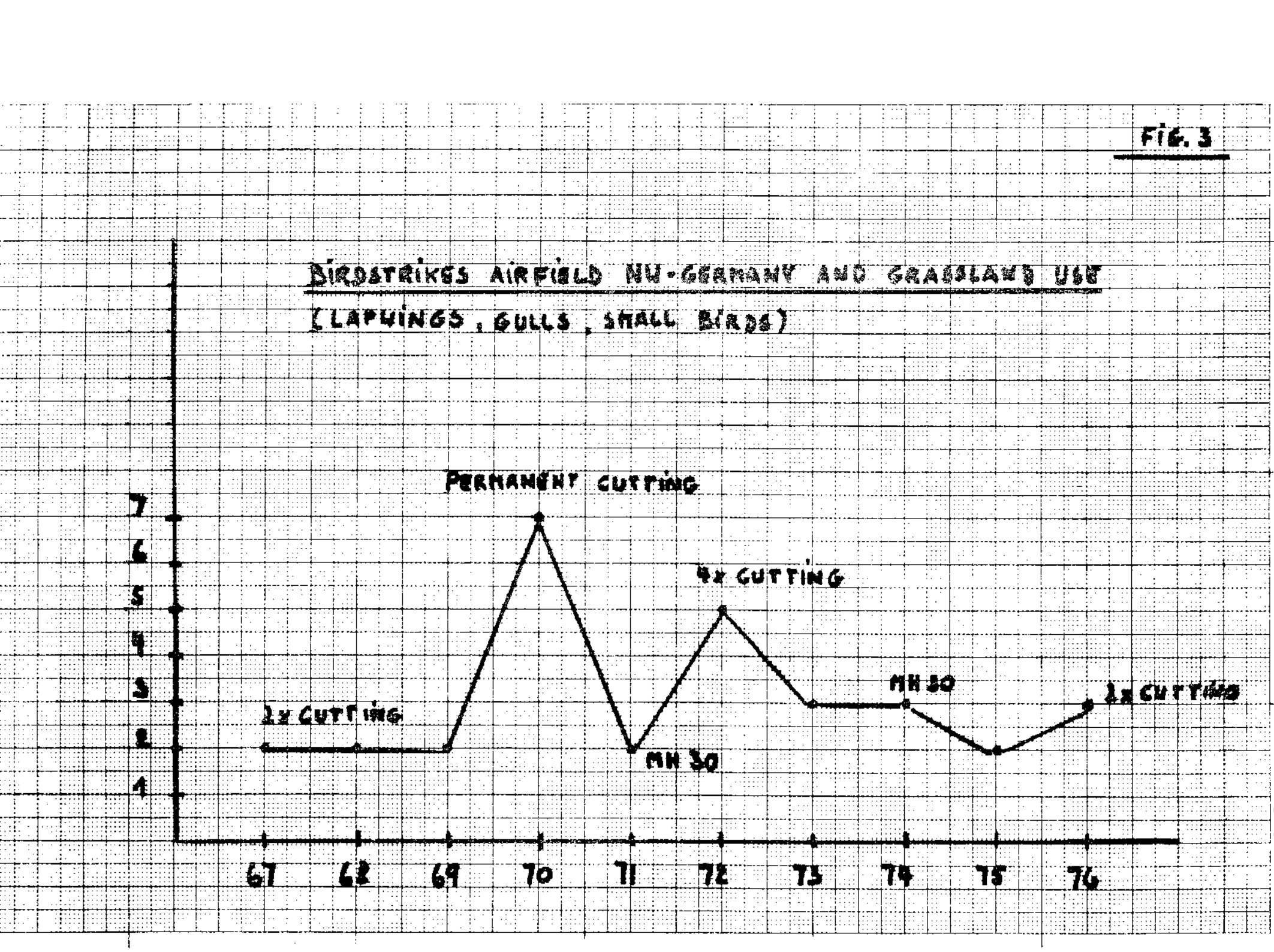

BIRDSTRIKES AIRFIELD NW-GERMANY AND GRASSLAND USE
(LAPWINGS, GULLS, SMALL BIRDS)
PERMANENT CUTTING
4x CUTTING
MH 30
1x CUTTING
MH 30
1x CUTTING
7
6
5
4
3
2
1
67
68
69
70
71
72
73
74
75
76

Fig. 4

BIRDSTRIKES AIRFIELD IN AGRICULTURAL AREA

(CROW, PIGEONS, STARLINGS, LAPWINGS, HAWKS)

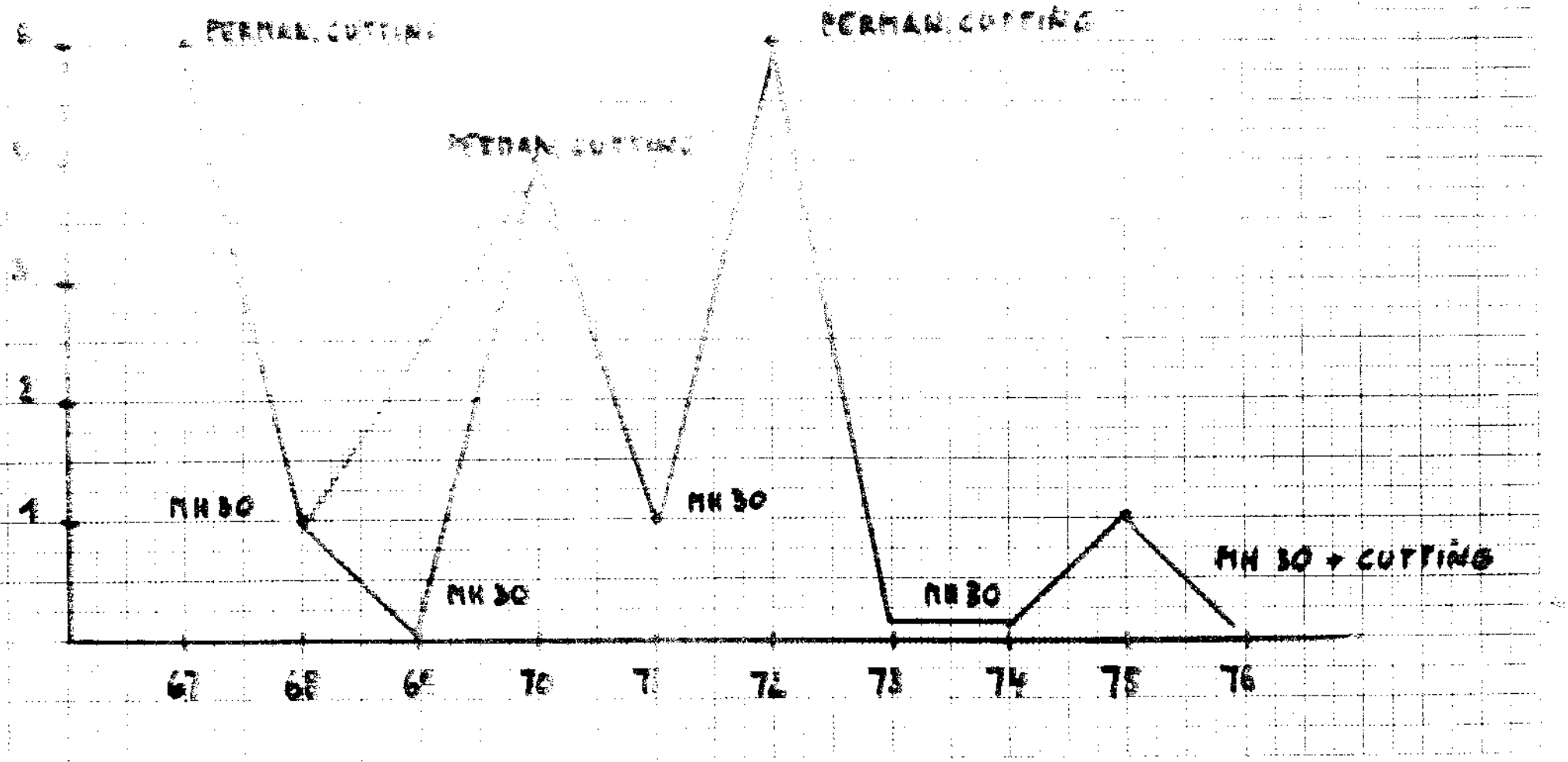
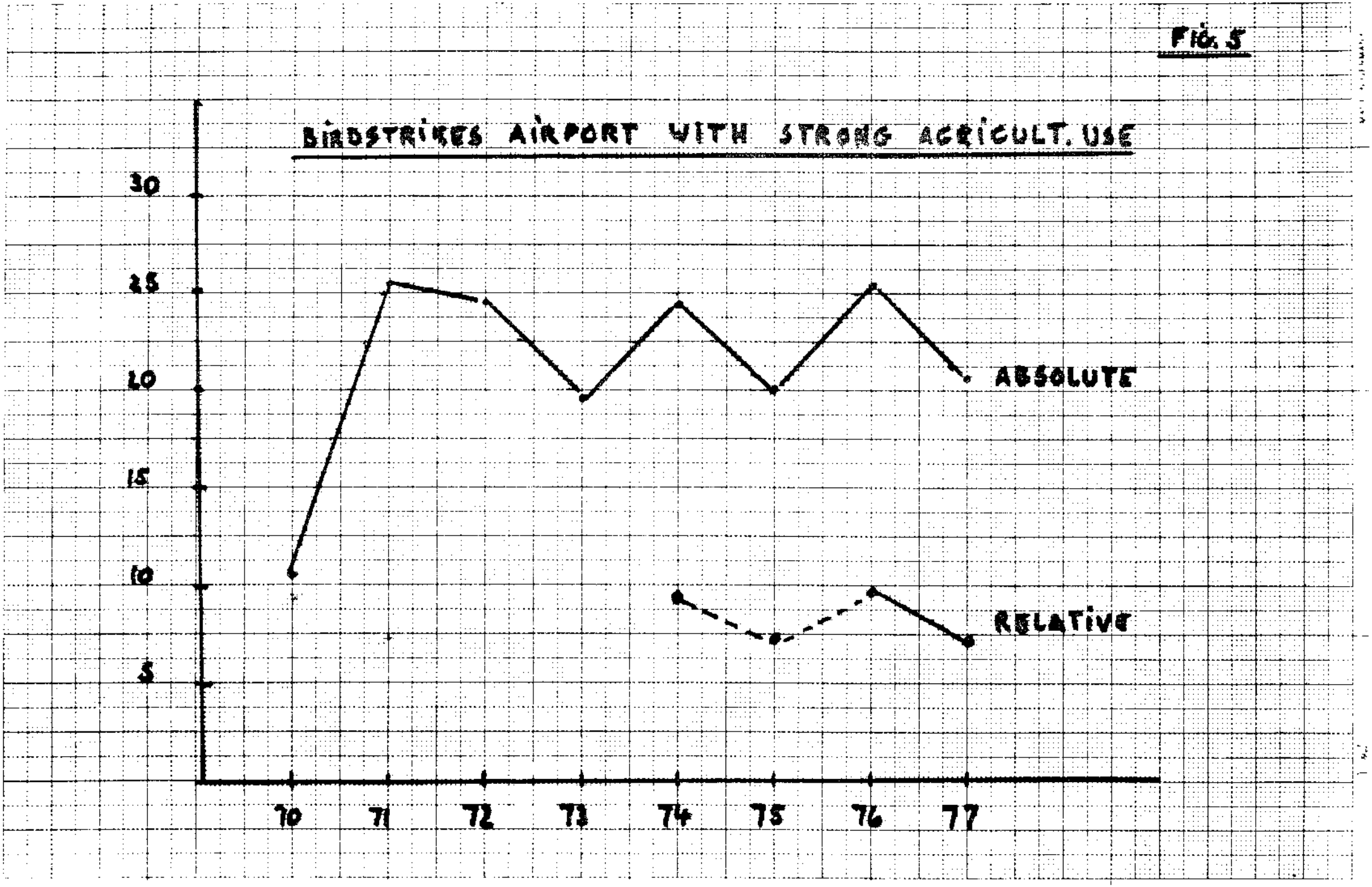


Fig. 5


BIRDSTRIKES AIRPORT WITH STRONG AGRICULT. USE
30
25
20
15
10
5
ABSOLUTE
RELATIVE
70
71
72
73
74
75
76
77

[illegible] WP 14

[illegible] working group aerodrome to further study WP 14. [illegible] was accepted.

[illegible] German film with comments in English:

[illegible] French film:

[illegible] very instructive and were received with applause by the [illegible].