

Review

Aviation's Impact on Agriculture and Its Animal Habitat

I.H.PH. DIEDERIKS-VERSCHOOR

*Leestraat 43
3743 EH Baarn
The Netherlands*

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ABSTRAK

Pengangkutan udara turut memainkan peranan penting dalam pertanian, yang mana kapal terbang digunakan untuk pengebuan tanaman. Kebaikan pengebuan tanaman memang terbukti tetapi ia juga merupakan aktiviti yang mungkin merosakkan alam sekitar.

Artikel ini membincangkan beberapa aspek berkaitan, yang dibentangkan dalam Rome Convention of 1952 tentang punca kerosakan permukaan kepada pihak ketiga. Turut dibincangkan ialah kesesuaian undang-undang negara dan undang-undang kes bersama-sama dengan kebertanggungjawaban terhadap kerosakan yang berpunca daripada semburan. Memandangkan kapal terbang jenis ini perlu terbang pada altitud yang rendah bunyi mungkin juga mengganggu haiwan.

ABSTRACT

Aviation also plays a role in agriculture, where aircraft are used for cropdusting. The benefits of cropdusting are evident but this is also an activity, which may lead to damage to the environment. The article discusses some of these aspects, viewed in the light of the Rome Convention of 1952 on damage caused to third parties on the surface.

Also the applicability of national laws and case law is considered, together with the responsibility for the damage caused by spraying. As this kind of aircraft has to fly at low altitude, the noise may also affect animals.

INTRODUCTION

The 20th century, now drawing to a close, has been marked by an astounding evolution in technology. New achievements reached out into all corners of the world, affecting and enhancing many areas of human endeavour. One might be inclined to think in the first place of the dramatic evolution in the telecommunications sector, and also in the field of civil aviation. There is a sector in civil aviation that has perhaps not attracted that much attention: it is the sector of 'agricultural aviation': cropspraying or cropdusting. Agriculture has experienced a tremendous impact as a result of the use of

aircraft. And not only agriculture: forestry and fisheries are also affected by cropdusting activities.

Using aircraft for agricultural purposes is not an entrepreneurial activity of recent date: experiments were conducted already at a very early stage of aviation, but large-scale developments did not occur until after World War II.¹

Benefits and Dangers of these Activities

There is no doubt that the benefits of cropdusting can be enormous. Without it, the cultivation of very large areas (superfarms) in

1. P.J. McBreen, 'Legal Implications of agricultural aviation', 18 JALC 1951, p.399-408.

the USA would not have been possible. The same goes for banana plantations in Central America. But, while emphasizing the benefits, we must not overlook the dangers inherent to its use. Agricultural aviation is a hazardous activity. It causes, relatively speaking, many accidents, given the small number of aircraft and flying hours involved. To do their job the aircraft have to fly at low altitude, which is risky, and the pressure of the workload on the pilots is high. More importantly, perhaps, are the dangers to the environment that may be caused by careless cropdusting. The strictest precautions and rules have to be observed and enforced. This aspect will have to be closely watched in the near future.

Recently, however, these drawbacks have been increasingly offset by using the most modern types of aircraft and helicopters, and technological improvements have already had a positive effect on the accident rate.

In the Netherlands, according to Article 2 of the Ministerial Decree concerning the exempted for low flying aircraft engaged in crop spraying, flying within 15 meters on either side of high voltage cables is prohibited. It is interesting to note that flying underneath a High Power Line is not exempted from this prohibition. The Supreme Court gave this ruling on 19 March 1991. It confirmed the decisions of the Magistrate and the District Court whereby defendant had been ordered to pay 55 guilders or 2 days confinement for infringing the Aviation Rules 1980 concerning low-flight cropspraying.²

Activities of Agriculture Aviation

Reverting now to the post-World War II period, we note that in 1962 the Food and Agricultural Legislation of Costa Rica³ described the activities involving agricultural aviation as follows:

- (a) Land preparation through the use of fertilizers and soil amendments

- (b) Seeding
- (c) Agricultural pest control
- (d) The application of defoliant, fertilizers hormones, insecticides and herbicides
- (e) Artificial rain-making
- (f) Any other use of aircraft for agricultural purposes which may be approved at a later date

McBreen⁴ asserts that the increased use of aircraft in agriculture was caused primarily by the large number of trained pilots and surplus aircraft being available after World War II. Another important factor was the production of modern, more effective pesticides.

Important elements in spraying are:

1. The chemical nature of the pesticide
2. The method of application
3. Wind direction
4. Stability in the air
5. Temperature and humidity
6. The experience of the pilot

Interesting is the case of *Loe v. Lenhardt*, in which the court ruled that the use of pesticides was an 'ultrahazardous activity'. In the US cropdusting is regulated in many states by statutes requiring users applying pesticides to be licensed.⁵

Damage Caused by Spraying

It is easy to understand that the spraying of land in the wrong way can cause severe damage. Shawcross⁶ comments: 'A group of cases of particular interest in that it illustrates the application of a number of different rules of liability to cases presenting very similar facts are the crop-spraying (or 'crop-dusting') cases. These arise from the use of light aircraft to spray or spread chemical weed-killers or other agricultural products, and the damage sustained by

2. Public Prosecutor v. X, Supreme Court of the Netherlands (Hoge Raad der Nederlanden), 19 March 1991, Rollnumber 88.160 (not published).

3. The Food and Agricultural Legislation of Costa Rica of 1962, Executive Decree No.1 promulgating Part VIII, Agricultural Aviation Regulations of the Costa Rican Air Regulations (Decreto No.1 por el que se aprueba el Reglamento de Aviacion Agricola como Parte VIII de las Regulaciones Aereas para Costa Rica), 5 January 1962, La Gaceta No.6, 9 January 1962, p.49.

4. See note 1, supra.

5. *Loe v. Lenhardt*, 227 Or.242, 362 P.2d 312 (1961).

6. Shawcross and Beaumont, *Air Law*, loose-leaf with supplements, 4th ed. (1977): see section 'English Law', p.V/131 (Supplement 70).

neighbouring landowners when the chemical is dropped, or blown on to their land and crops.'

Negligence

A majority of the states nationwide have held that the liability of an aerial application must be based on a finding of negligence.⁷ Prosser⁸ defines negligence as conduct which involves an unreasonable risk of causing damage.

In the case *Parks et al. v. Atwood Crop Dusters, Inc. et al*⁹ the court decided that a company which is engaged in crop dusting by aircraft is liable for damages to a crop in fields adjacent to the field being dusted where negligence is the proximate cause of the damage.

No person is permitted by law to use his property in such manner that damage to his neighbour is a foreseeable result, and the duster had been warned not to allow a defoliant to get on the adjacent fields.

United States courts have held the operator of the aircraft liable in such cases on the basis of trespass, negligence, and on a theory of strict liability akin to that in *Rylands v. Fletcher*.¹⁰ In addition, in cases where the landowner who used a crop-spraying service has been joined as defendant, he has been held liable despite the usual rule barring liability for the acts of independent contractors, either by declaring the activity to be an ultrahazardous one, or by viewing the landowner as under a non-delegable duty.

Damage to Animals

Damage can be caused not only to crops but also to animals.

A Canadian ruling concerned the following case:

A beekeeper suffered damages because the cropdusting of a cornfield had been carried out in such a way that his bees, on an adjacent field, were killed. The defendant was accused of

spraying unlawfully, without taking the necessary precautions, and with carelessness and gross negligence. The spraying had been carried out by an inexperienced employee. Compensation was granted by the Court.¹¹

Another case about damage causing the death of bees is *Lenk v. Spezia et al.*¹² The appellant, a bee-keeper, brought action to recover damages for the death of his bees allegedly caused by the appellees' negligent aerial dusting of crops with insecticide in adjacent fields. The Court held that there was ample evidence to support the findings that the appellant is barred from recovery because of contributory negligence.

The defendants denied that they had deposited or negligently permitted poisonous insecticide to be carried to or spread upon plaintiff's bees or feeding grounds, and affirmatively alleged that plaintiff's loss of bees and honey was due to his own contributory negligence in failing and refusing to remove the hives or to protect the bees from the poisonous dust in spite of the fact that he had previous knowledge of the defendant's intention to use that powder to dust the tomato crops in the vicinity of his hives.

Another case of death of bees was mentioned in *Jeanes v. Holtz et al.*¹³ The appellant, a bee-keeper, brought action to recover damages for the death of his bees allegedly caused by negligent and careless aerial crop-dusting by the appellees in near-by fields. The Court affirms a judgment for the appellees upon finding that no sufficient basis existed upon which to predicate liability on the part of the appellees.

In the Law of the United States it has been stated that Section 596 of the Penal Code provides that 'Every person who ...wilfully administers poison to any animal, the property of another, or exposes any poisonous substance, with the intent that the same shall be taken or

7. T.W.Conklin, J.W.Adler, S.W.Hoyne, 'Indemnity and contribution in the litigation of aerial application claims: looking for a deeper pocket', 45 JALC 1980, p.375-391.

8. W.Prosser, Handbook of the Law of Torts, 4th edition, 1971, p.145

9. *Parks et al. v. Atwood Crop Dusters*, California District Court of Appeals, 5 June 1953, Avi, vol.3, p.18,239.

10. *Rylands v. Fletcher*, LR 3 H.L. Cas.330 (1886).

11. *Haineault v. Paul-Emile Toupinet Beaver Airspray*, Cour Supérieure de la Province de Québec, District d'Iberville, 11 May 1988; see also L.S.Kreinder, Aviation Accident Law, 1993, who gives in para.6.02 an extensive list of crop dusting accident litigation.

12. *Lenk v. Spezia et al.*, California Court of Appeal, Third District, 22 December 1949, Avi, vol.3, p.17.106. 3: 17-106.

13. *Jeanes v. Holtz et al.*, California Court of Appeal, Fourth District, 28 November 1949, Avi, vol.3, p. 17.104.

swallowed by any such animal, is guilty of a misdemeanor.' It is clear that this section has no application to the unintentional poisoning of bees on one's own premises. Bees are not classified as predatory animals under section 1230 of the Fish and Game Code in the US.

The court of appeal affirmed the judgment for the appellants upon finding that no sufficient basis existed upon which to predicate liability on the part of the appellants.

In the Holt case¹⁴ defendant sprayed his crop of maize with a compound containing poison to protect the growing grain from grasshoppers which were prevalent and harmful to his crop. Plaintiff's cattle trespassed on that land and evidently procured some of the poisonous mixture, as a result of which several cows died. Plaintiff brought suit for damages and recovered judgment. On appeal the judgment was reversed.

The court held that because the cattle were trespassing on the land at the time they procured the poisonous mixture from which they died, the plaintiff was precluded from recovering damages.

A case about damage caused to fishes is the following. During crop dusting minnows were destroyed in an adjacent pond. The Court decided that the corporation which performed the spraying was negligent and must be held liable for the damage.¹⁵

But also ordinary but low flying aircraft may cause damage, because noise can terrify cattle in such a way that they wound themselves in trying to escape.

Well-known are the cases of turkey farms and minks at fur farms. In a few instances minks at fur farms became so terrified by overflying aircraft that they killed their young or gave birth prematurely.

Yet, no compensation was due, according to the Rome Convention of 1952 on Damage Caused by Foreign Aircraft to Third Parties on the Surface¹⁶. Also touristic balloons, which are

coming more and more in the picture, can cause damage at the surface.

Rules for Compensation, The Rome Convention of 1952

What are the rules for compensation if damage caused by such activities occur? Now that international relations have become more integrated, involving also agricultural aviation activities between countries, the Convention of Rome of 1952 (with added Protocol of 1978) on damage caused to third parties on the surface could apply on international activities when the parties have adhered to the Convention. The Convention is in force, but it did not attract many ratifications. The reason for this lack of interest can be described as follows:

1. The limits for compensation mentioned in the Convention were considered too low;
2. National legislation provided adequate safeguards for the interests of third parties on the surface: it was felt that there was no need for international rules on the subject;
3. The Convention did not deal with problems such as noise, sonic boom or nuclear damage;
4. There were objections against creating only one forum.¹⁷

In this Convention the fundamental legal principle is that anyone who creates a dangerous condition, through the use of an instrument or machine, becomes responsible to any person who is thereby injured and bears the liability to compensate for the injury thus inflicted. The Convention is not applicable to aircraft of the own state. One finds the above-mentioned principle in most national laws.

Applicability of National Laws

However, in a great number of cases, the spraying is done by aircraft of the same nationality as that of the land-owner, so that mostly national laws will apply. Most countries have indeed regulations on this point, either by common civil law, or by special regulations.

14. Holt v. Mundell, 107 Colo., 373, 112 P.(2d), 1039, 1043.

15. Kentucky Aerospray v. Mays, Kentucky Court of Appeals, 26 September 1952, Avi 3, p.18,024. 3: 18-24.

16. Nova Mink v. Trans-Canada Airlines, Supreme Court, Nova Scotia (Canada), 5 January 1951, USAvR 1951, p.40 and Zfl 1952, p.381.

17. G.Rinck, 'Schäden Dritter im Internationalen Luftverkehr: über den bisherigen Misserfolg des Römer Haftpflichtabkommens', ZLW, 1962, pp.85-104; and by the same author, 'Damage caused by foreign aircraft to third parties', JALC 1961/1962, p.405-417.

In general the liability for damage caused to the farmer will depend first of all upon the terms of his contract with the agricultural contractor. It often happens that spraying effects other areas or places than those that had been agreed upon, either by pilot error or changes in the wind-direction. There are several rulings relating to such cases. The first decision concerned the question of crop-dusting liability is the case of *Gerard v. Fricker*¹⁸. Both the airplane owner and the farmer employing the pilot were held liable for damages to the adjoining landowner caused by the drifting of the poisonous dust. The Court spoke of 'inherently dangerous' nature of the work, and said 'this is especially true where the agency or means employed to do the work, if not confined and carefully guarded, is liable to invade adjacent property, or the property of others, and destroy or damage it'.¹⁹

In another case, *Miles v. Areno Co.*²⁰ the Court did not speak of crop-dusting as being 'inherently dangerous'.

From the words used by the Court it can be inferred that the Court was not holding either the farmer or the pilot to the same high degree of care that was felt necessary in the above-mentioned *Fricker* case.

Two factors can have an influence on decisions regarding the degree of liability, namely:

- a) If a precautionary warning has been given of the 'dusting' operation of the neighbouring land;
- b) The courts expect that the promoter of a 'dusting' operation has a special knowledge of the spray that he is using and of the best spraying methods.

In a Dutch case²¹ a penalty had been ordered for insufficient care in spraying by helicopter. The magistrate accepted that the defendant had not acted with such care that there was no risk for human consumption. He had insufficiently taken into account the force and direction of the wind. According to a report of the Royal Netherlands Meteorological Office the windforce at the time of spraying was more than 5 meters per second.

The Netherlands Horticultural Service and other agencies combating horticultural pests and weeds have warned that under no circumstances spraying may take place with a windforce of 5 meters per second, and that the spray should never be allowed to affect other agricultural produce.

This applies in particular to produce for human consumption, like garden vegetables. It unfortunately still occurs fairly often that, either through pilot's error or changes in the wind-direction the spray lands on places or areas other than those that had been agreed.

Another case of drifting insecticide was discussed in *Burns v. Vaughan*²². Appellant caused his rice crop to be sprayed by airplane with an insecticide. Some of the insecticide drifted to the appellee's land and damaged a cotton crop there. The Court holds that the evidence was sufficient to make the issue of negligence a matter for the jury and affirms the judgment in favour of the appellee.

Another case of damage by aerial cropdusting was the case *Kennedy v. Clayton*²³. In this case also discussion came up about drifting

18. *Gerard v. Fricker*, 42 Ariz. 503, 27 P. (2d) 678 (1933).

19. A similar case is *Hammond Ranch Corp. and Homer Ricks v. Dodson and Williams*; 199 Ark. 846, 136 S.W. (2d) 484 (1940).

20. *Miles v. Areno Co.*, 23 Cal. App. (2d) 680, 73 P. (2d) 1260 (1937).

21. *Public Prosecutor v. X*, Court of 's-Hertogenbosch (The Netherlands), 25 July 1983; see F.A. van Bakelen and I.H.Ph. Diederiks-Verschuur, *Compendium Jurisprudentie Luchtrecht*, 1988, p.165.

22. *Burns v. Vaughan*, Arkansas Supreme Court, 21 November 1949, *Avi*, vol. 3, p.17,103. See for further cases about damage to adjoining property caused by drifting insecticide: *Pruett v. Burr et al.*, *Sherwin-Williams Co.*, appellant, California District Court of Appeals, 27 May 1953, *Avi* vol.3, p.18,230; *Pendergrass v. Lovelace*, New Mexico Supreme Court, 9 October 1953, *Avi* vol.4, p.17, 375; *Julian Gotreaux v. Roy Gary et al.*, Louisiana Supreme Court, 25 February 1957, *Avi* vol.5, p.17,269; *Vrazel v. Bieri et al.*, Texas Court of Civil Appeals, 20 September 1956, *Avi* vol.5, p.17,310; *E.J. Burke v. Wilson Thomas*, Oklahoma Supreme Court, 25 June 1957, *Avi* vol.5, p.17,497; *Prince Jones v. James Stewart Morgan et al.*, Louisiana Court of Appeal, 28 June 1957, *Avi* vol.5, p.17,548; *Aerial Sprayers Inc. v. Yerger, Hill & Sons et al.*, Texas Court of Civil Appeals, 16 October 1957, *Avi* vol.5, p.17,608.

insecticide and also the question of the aviator's status as servant or independent contractor.

The defendants, owners of a rice crop, hired an aviator to spray their fields with 2, 4-D. Some of the chemical drifted to nearby cotton fields and damaged the cotton crop owned by the plaintiffs. A duty rested upon the defendants to exercise the degree of care commensurate with the danger they actually knew of, or the danger factor that they would have found if, as reasonable men, they had made inquiry. If they did not actually know of the probability that 2, 4-D would drift, the knowledge that they did have of its dangerous characteristics should have put them on notice, resulting in an investigation along precautionary lines. Further, the trial court's failure to permit the jury to say whether the aviator was a servant of the defendants or an independent contractor made no difference; the 2, 4-D was inherently dangerous to cotton crops, and the defendant's liability could not be shifted.

Videla Escalada gives the following example. The owner of the plantation in Argentina claimed damages to the amount of \$ 900,000, basing his claim on the rules of the Civil Code, which governs liability for unlawful acts. The defendant opposed that in the present case the Court was not the competent instance, and based his argument on the Aviation Code concerning damage caused to third parties on the surface, which limits the liability to the amount of \$ 150,000, according to the weight of the aircraft. The Court declared itself competent and ordered the defendant, according to the rules of the Civil Code, to pay an amount of \$ 1,000,000, a sum which was higher than the one required and which took account of an eventual devaluation. A higher instance affirmed the decision, but reduced the amount to \$ 400,000, which was less than half the sum required, but more than twice the maximum amount provided in the Aviation Code, which the defendant appealed to.²³

Period of Liability

An important problem of liability in agricultural aviation is the following. When the spray touches the plants of a neighbouring land, the spray may cause damage, but it is possible that this damage does not become apparent immediately, but only after some time: it is the chemical action of the spray that causes the damage, and the chemical action of one spray may show later than the chemical action of another. Therefore it is necessary to know when the operator will cease to be liable. A clear distinction between the liabilities of the operator and the landowner would be most desirable. Perhaps a standard contract between landowners and agricultural operators would be the answer to the problem.

Which Person will be Responsible?

Although national laws prescribe minimum altitudes for balloonflights, cases of damage being caused by them do still occur occasionally. There has been an interesting case centering round the question of liability²⁴: in 1988 there was a landowner alleging that his horse and a herd of cows had panicked and bolted, because of a balloon landing and taking off nearby. This resulted in the animals injuring themselves and damaging silage. The claimant alleged that the damage was caused by the fault and unlawful action of the trainee-balloonist, presenting the following argumentation: 'When one undertakes a balloonflight, which is widely known as a risky means of transport, one is obliged to take into account the risks involved and to pay compensation for the damages occurring in case of "mishaps".'

The Court found that the trainee was not liable because the liability was, in principle, the captain's. Abandoning this principle would be justified only if the trainee had acted against the captain's instructions, or if he, acting in accordance with the instructions, could reasonably be expected to understand that

23. *Kennedy v. Clayton*, Arkansas Supreme Court, 13 March 1950, *Avi*, vol.3, p. 17,152. Another case on problems caused by crop dusting with 2,4-D is *YASUKOCHI INC. v. McKIBBIN et al.*, California District Court of Appeal, 25 June 1957, *Avi* vol.5, p.17,598.

24. F.Videla Escalada, 'Les dommages causés à la surface par un avion épandant un produit herbicide sont-ils soumis aux règles du droit aérien?', *RGA*, vol.27 (1964), p.231-235.

25. J.N. and J.N.M.van Zijl v. S.Lemstra, Court of Middelburg (The Netherlands), Rollnumber 689/1987 (unpublished).

obeying the instructions could jeopardize safety. The landowner's claim was rejected.

Another question which arises is whether the landowner whose land is being sprayed and who had hired an independent contractor is liable. The contractor may be an independent firm. In practice there are three possibilities:

1. Some Courts require that some measure of control by the landowner is established before imposing liability,
2. A second category of Courts take the view that the nature of the activity is inherently dangerous, so the landowner does not have the obligation of control and
3. A third category of Courts imposes liability on the landowner based on ownership liability statutes.

In cases of damages caused by spraying or by noise the Courts' decisions will mostly be based on national laws regulating the use of insecticides and pesticides, the liability and the flight altitude.

Finally the manufacturer of the pesticide may be found responsible.

An interesting case is *Walton et al. v. Sherwin-Williams Co. et al.*,²⁶ which centered on damage to crops in nearby areas by crop spraying by aircraft.

The case was as follows: An action brought by a group of farmers against the manufacturer of a weed-killing chemical which had damaged crops near a spraying area was dismissed. The Court found that the manufacturer had taken adequate precautions in the testing and labeling of the chemical and that the chemical was not inherently dangerous if ordinary care was taken by farmers and pilots in choosing the fields to be sprayed, in choosing the time for spraying, and in operating the plane.

Insurance

Damage caused by noise or by spraying has generally been excluded from insurance. A Policy of the Dutch Aviation Pool has been added as an Annex to this text.

CONCLUSION

There is a fast growing tendency to respect and save the environment, and it is to be expected that more and more attention will be focused on this problem in the near future. Technical improvements and enforcement of the prescribed rules in national laws will be required to achieve any results.

(Received: 10 December 1999)

26. *Walton et al. v. Sherwin-Williams Co. et al.*, US Court of Appeals, Eighth Circuit, 15 August 1951, *Avi*, vol.3, p.17,685. Another case centring on negligence of the manufacturer is *Reasor-Hill Corp. v. Harrison*, Arkansas Supreme Court, 21 January 1952, *Avi* vol.3, p.17,820.

Annex

Insurancecompany
De Nederlandse Luchtvaartpool N.V

Noise and Pollution and Other Perils Exclusion Clause

1. This Policy does not cover claims directly or indirectly occasioned by, happening through or in consequence of:
 - (a) noise (whether audible to the human ear or not), vibrations sonic boom and any phenomena associated there with
 - (b) pollution and contamination of any kind whatsoever
 - (c) electrical and electromagnetic interference,
 - (d) interference with the use of property;

unless caused by or resulting in a crash fire explosion or collision or a recorded in-flight emergency causing abnormal aircraft operation.
2. With respect to any provision in the Policy concerning any duty of Underwriters to

investigate or defend claims, such provision shall not apply and Underwriters shall not be required to defend

- (a) claims excluded by Paragraph 1 or
- (b) a claim or claims covered by the Policy when combined with any claims excluded by Paragraph 1 (referred to below as 'Combined Claims').

3. In respect of any Combined Claims. Underwriters shall (subject to proof of loss and the limits of the Policy) reimburse the Insured for that portion of the following items which may be allocated to the claim or claims covered by the Policy:
 - (i) damages awarded against the insured and
 - (ii) defence fees and expenses incurred by the insured
4. Nothing herein shall override any radioactive contamination or other exclusion clause attached to or forming part of this Policy.

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