

THE FUTURE OF AERIAL AGRICULTURE FOR GRASSLANDS:

AERIAL SPRAYING - MINIMISING THE RISK

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Abstract: *The risk of off-target contamination resulting from the aerial application of agricultural chemicals and fertilisers to crops and pastures can be minimised by the aircraft operator and/or the pilot paying particular attention to the spray or spreader pattern, droplet or granule uniformity, wind speed and direction, temperature and humidity, and the location of sensitive areas. Others involved in the spraying or spreading job, both farmer and his adviser/consultant should also be familiar with the correct conditions for aerial application and not pressure the pilot into carrying out the job in unsuitable weather or contrary to regulations. Education and training of all involved including the pilot, the ground support staff and the farmer client is therefore essential. Co-operation between all parties concerned is the key to success.*

A small but vocal and politically influential minority in the community has expressed opposition to aerial application of pesticides for 30 years. It started with Rachel Carson's book, "Silent Spring" in 1962. The fuss in this country started with the application of DDT on cotton, linseed and other crops attacked by heliothis and then spread to the herbicides 2,4,5-T and 2,4-D. Now every chemical that is applied by aircraft, even white oil on bananas, is subject to criticism. There have even been instances of sickness reported when aircraft were spraying coloured water for demonstration purposes. We ask ourselves, is it aircraft that they are opposed to or just agricultural chemicals in general. There are a number of explanations:

(1) The anti-pesticide activists can severely restrict the use of many products, and we might add, the growing of many crops and pastures, by having aerial spraying banned.

(2) Aircraft are the most visible and audible aspect of chemical use in agriculture. An orchardist can spray behind his windbreak without the public being aware and a wheat farmer can run his boom over a remote paddock without being seen or heard.

(3) Aircraft are linked to corporate farming - cotton, vegetables and other irrigated crops which are targets for the anti-multinational activists. They are often the same people who wear the anti-pesticide hat.

(4) Some politicians have found the anti-pesticide and anti-agricultural aircraft cause a good one to obtain publicity for themselves from most media outlets.

(5) And the media. For reasons that are not fully understood, most sections of the media tend to over-sensationalise or over-dramatise the use of aircraft in agriculture. An aircraft makes good television and good newspaper pictures. For example, TV presentations on the beef residue crisis featured aircraft. The beef residue crisis led to the Senate Committee of Inquiry into Agricultural Chemicals.

The weight of evidence against aerial spraying given to the Committee certainly did not justify its prominence in the report nor in the Chairman's press release. The Government's response to the Senate Report will be tabled after this paper is written but before this Conference.

Notwithstanding, there remains a readiness to point the finger at agricultural aircraft whenever the question of pesticide use is discussed.

INDUSTRY TRAINING

What is the industry or more precisely the Aerial Agricultural Association of Australia (AAAA) doing about it?

Some five years ago the AAAA recognised that, for the industry to survive, it was going to be necessary to take a more active position. Constraints of space in this paper do not permit a thorough coverage of the steps that were then taken but it is sufficient to say that Operation Spray Safe was born. It had three objectives:

- Education and training of industry personnel;
- Public relations; and,
- Technical development.

Subsequently, it was determined that the limited resources of the AAAA were best placed in the area of education and training of industry personnel and the education of the industry's farmer-clients.

Technical development, with the exception of improved application techniques and methods for determining spray drift, are unfortunately beyond the resources of the industry in Australia at the moment. Even in the area of application techniques, the number of people working in a development or extension capacity in both government and academia can be counted on one hand.

Most of the development work, be it aircraft or dispersal equipment design takes place in USA. The AAAA maintains close contact with manufacturers in the USA and thus the local industry suffers nothing through lack of access to the most modern equipment.

In early stages of Operation Spray Safe, the hopes of many were pinned on a public relations campaign to inform the public, particularly the urban dweller, that our activities were not only acceptable but valuable and necessary.

For PR campaigns to be effective they must be professional and encompass most sections of the media, particularly television. They are therefore expensive and there is no guarantee of success. For example, the NFF "Our Country" campaign was a flop. The mining industry spent \$15 million to achieve partial success. The timber industry spent millions of dollars and is only now starting to get somewhere.

We decided that chemicals were the issue and if millions of dollars were needed, the AAAA couldn't find them. The agricultural chemical industry could, but chooses not to go beyond education through literature and specific programs for schools.

At present our total effort is being directed towards the Operation Spray Safe Accreditation discipline. An agricultural pilot is highly trained. He holds a commercial flying licence and an agricultural rating issued by the Civil Aviation Authority.

He is also licensed by the State Department of Agriculture. In addition he is now approved in the AAAA Operation Spray Safe training program. This involves an examination based on the AAAA "Pilots & Operators Manual".

The ground support staff are also trained under the Operation Spray Safe program with the emphasis being placed on occupational health and safety. This training is carried out at regional workshops and on the job using the Chemical Handling Manual and videos produced by the AAAA and Adelaide TAFE College. Both pilot and ground staff training are an integral part of operator accreditation because to gain AAAA accreditation an operator must, amongst other criteria, employ only industry trained and examined personnel.

Accreditation involves a visit to the operator's base by a committee comprised of a government representative, a farmer representative and an AAAA director, who check the equipment and storage/mixing facilities. It is subject to annual review.

CHEMICAL APPLICATION

Safe and efficient aerial application of chemicals involves the farmer and his adviser or consultant, the aircraft operator, his pilots and ground support staff and his equipment. The reason for emphasising this is that timing is so important, as is location in respect of neighbouring buildings, crops and waterways. Timing must of necessity suit the weather conditions and location and this does not always coincide with the optimum time to spray to control the pest or disease.

Off-target spray drift can be caused by a combination of factors involving the equipment, the pilot, meteorological conditions, the location of the job and the attitude of the parties involved. Again, time does not permit a detailed study of spray droplet production. The following factors, all of which are addressed in detail in the "Pilots Manual" are important in the prevention of off-target drift:

- Spray droplets should be uniform in size.
- Avoid droplets being caught in wing-tip vortices.
- Spray pattern across the swath should be uniform.
- A steady and positive wind direction is ideal. Calm conditions are to be avoided.
- Where possible crops and pasture should be flown crosswind.
- Wind direction should be away from sensitive areas of susceptible crops, and pasture, buildings, waterways *etc.*
- If extremely hot and dry conditions cannot be avoided, increase spray volume and/or droplet size.
- A smoker on the aircraft should be used to judge wind speed and direction.
- Map the area.

Generally speaking, all sensitive areas near the spray target should be identified including susceptible crops and pastures, beehives, human habitation, stock, waterways, roads, etc. If the area is not familiar to the pilot, pre-spray inspection of the target area should be made. It is not always wise practice to rely on farmers

mud maps and verbal advice concerning adjoining crops and pasture.

If necessary an appropriate buffer zone should be left between the target area and downwind sensitive areas. As the downwind movement of materials depends on a number of the factors mentioned above, it is not desirable to indicate a specific distance as a safe buffer zone. The range of 150- 300 metres could be a guide. Spray does not drift upwind and therefore a permanent buffer zone is neither practical nor warranted.

Contrary to popular opinion, aerial spraying can be carried out with little, if any, risk to people, animals and the environment. Many aircraft operators have been doing it for years. It is a question of following established guidelines and making no compromise to commercial pressure. By that we mean the pilot should not be pressured into spraying by his client when conditions are unsuitable, particularly if the area to be sprayed is close to town, a school, a watercourse and so on.

There are many areas that have previously been sprayed by aircraft which in the light of our present knowledge, should be treated in future by some other method, or not planted with a crop or pasture requiring pesticide treatment.

Some European countries have phased out aerial spraying; and so they should as crops are grown in their backyards. Even in this vast and sparsely populated land we have a rural/urban interface problem that has not yet been adequately addressed by planning authorities. Coffs Harbour is a good example where tourist resorts are being built right in the banana plantations. Other examples are where cotton is grown on the edge of towns and in the bends or banks of rivers.

If we don't separate agriculture from suburbia, farmers will always be under pressure whether they control insects and weeds with chemicals or some yet to be developed biological method. I wonder how the greenies will handle insect virus and plant toxins.

WHAT OF THE FUTURE?

The agricultural aircraft industry will survive but it must change, not fundamentally, but with some reforms. There must be no place for the inadequately trained pilot. Nor for the adequately trained pilot with the wrong attitude. Similarly some aircraft operators and their farmer clients must acknowledge community concerns and act more responsibly even if it means waiting a week for a spray job to be carried out under safer conditions.

Whilst chemicals are required to control insect pests, diseases and weeds, aircraft will continue to be the most economical means of application in most circumstances. In some instances such as damp black soil, aircraft provide the only means of spraying unless permanent tracks are built through the crop.

Seed and fertiliser is also most economically distributed by aircraft. Adherence to correct application techniques is just as important with fertiliser and seed. Both are subject to off target deposition through wind speed and direction. High analysis fertilisers, spread at low rates through a specially designed spreader attached to the aircraft, rely on accurate placement for cost effectiveness, lack of striping and avoidance of contamination of waterways and habitation. Biological control methods (*eg. mycoherbicides*) will also require aircraft for distribution.

Forget what happened in England, Denmark and Switzerland. It is not relevant. We have to grow unsubsidised crops and graze animals on unsubsidised pasture on a large scale to compete on world markets.

REFERENCES

- "Pilots and Operators Manual", *Aerial Agricultural Association of Australia*.
- "Chemical Handling Manual", *Aerial Agricultural Association of Australia*.