

## Crop Spraying in the British Empire

*Two very interesting Reports have recently come to hand and are here placed on record, being the first applications by British operators of the Helicopter to agricultural use*

*The reports are of a preliminary nature and cover few of the technical details, but are none the less interesting in their appreciation of the general problems of Tropical operation Arrangements are in hand to organize a meeting of the Association to discuss the various aspects of crop spraying at which the operational and chemical problems may be examined in full*

FROM MESSRS IRVIN-BELL HELICOPTER SALES, LTD ,

TRINIDAD July, 1948

An experiment in the use of the Helicopter for dusting sugar cane was recently made in Trinidad, British West Indies The Helicopter used was a Bell 47D operated by Irvin-Bell Helicopter Sales Ltd , on behalf of Messrs Caroni Ltd , and flown by Mr N J CAPPER, A F C

Messrs Caroni, among other sugar growers in Trinidad, have been trying to find a satisfactory method of dealing with the froghopper, an insect pest which feeds on sugar cane, and in some areas causes considerable damage Ground equipment has so far been found unsatisfactory, because of the expense involved and the difficulty of covering a large acreage

The machine arrived in Trinidad on the 21st June, 1948 British West Indian Airways were more than generous in providing accommodation for its unloading and erection, and in giving assistance, and, on the 25th June it was flown from Piarco Airport to the Waterloo Estate of Caroni Ltd , where a special hangar had been built

Some experiments were carried out from the 28th June until 1st July, in order to find out the best rate of application of the insecticide, the best height to fly, speed, etc Then it was decided, as the froghopper which emerges during the rainy season had made an early appearance, to start dusting with a view to killing froghoppers and to make experiments during the process

Between the 1st July and the 17th August some 3,000 acres were covered Dusting was done in the early morning, evening and night The froghopper is a night feeder and hides in the sugar cane during the day It will only come out before dusk if the temperature drops, and it retires to the cane at about 7 a m The best results were obtained at night when the strength of the wind was usually less than 5 m p h

Insecticides used were D D T , and " Gamexane," and it was soon found that the helicopter provided a means of applying insecticide far superior to any way which had been tried before

In good conditions the adult froghopper could be eliminated, but unfortunately although the dust was forced right down through the cane by the down wash from the helicopter rotor, the residual effect of the insecticide was most disappointing and did apparently no damage to the " nymph " or grub This meant that as the adult population would build up again in three or four days, repeat dustings had to be made Nevertheless the population must have been reduced



*Dusting a sugar cane field*

The operations were carried out from Derrick Sites on the various Estates and fuel, dust, etc , were run to the site by the Company's " loco " The helicopter showed that it could land in places unfit for walking, or even horse-riding, but sites had to be chosen which permitted safe walking for the loading teams Moonlight flying presented little difficulty, especially when the pilot was familiar with the field and obstructions Without a headlight dusting in complete darkness is not considered practicable, as difficulty in seeing the top of the sugar cane and gauging height above it is experienced Flights to and from the base were made in darkness without trouble

Although temperature and humidity were high, the latter being 98 to 100% and the density altitude at times 2,700 feet, the Franklin engine gave full power and the Bell carried its full load of dust with 14 Imperial gallons of fuel Dusting was carried out at cane top height at 20 m p h , and it was found that 60 to 70 acres could be covered in one hour's flying when dusting individual fields Re-loading with dust took from half-a-minute to one minute when the crew were trained

From the point of view of the Bell Helicopter the experiment was most successful as it showed its ability to apply insecticide evenly over a large area Far better results could no doubt be obtained if more effective insecticides were used to eliminate the necessity of redusting frequently, as this necessity reduced the number of acres which can be covered in a season by one helicopter From the pilot's point of view the experiment was intensely interesting Dusting sugar cane in the Tropics by moonlight in a helicopter is an experience it must be difficult to surpass

The machine proved itself in every way a real work horse Tropical conditions with their heat, high humidity and torrential rain seemed of no account The helicopter was housed almost on the doorstep of the bungalow occupied by the pilot and engineer and flights to the dusting areas were made in a few minutes These flights provided a unique view of the natives' rice

growing activities, and the take-off attracted the usual audience. Landing sites needed no special preparation, the helicopter was just adapted to any conditions without trouble.

Practically all the cane fields were quite straight forward and without obstructions, but a few were surrounded and broken up by trees and hedges. None of these were refused and served to show that the helicopter can dust almost anywhere. Dusting runs were made across wind and all turns into wind. The perspex bubble was kept on as a protection against heavy rain, birds, etc., and even in the heat of the day the cockpit temperature was pleasantly cool as soon as the helicopter was airborne. Several small birds were hit with no damage to the rotor. The bigger birds kept well away and showed a preference for less animated material.

On Wednesday, the 14th July, the Governor of Trinidad, Sir JOHN SHAW, attended a demonstration at the Caroni Estate, after which he was flown from Caroni Estate to Government House, and landed on the lawn in Government House grounds.

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(FROM MESSRS PEST CONTROL LTD)

**KENYA** *October, 1948*

The first helicopter to fly in Africa took off from Khartoum on October 9th. It was a Westland Sikorsky operated by Messrs Pest Control Ltd, and piloted by their Chief Pilot, Mr J E HARPER, A F C. This was the outcome of much experimental work and an intensive spraying programme carried out in this country by the Company during the last year.

The first flight was a short test flight at an air temperature of 102° F and the aircraft rose more sluggishly than in U K, but it performed quite well during the next test flight the following morning at 07.45 hours, and lifted its full load at 92° F. This was then followed by a regular test flight every hour on October 12th to ascertain the lifting power and the performance in the hot, thin air of Khartoum. This capital of the Sudan is only 1,200 feet above sea level, but owing to the great heat the air density is equal to

*Messrs Pest Control's machine spraying in this country early this year*



4,500 feet over England. The machine had been fully tropicalised and fitted with special dust filters to protect the engine, and additional precautions such as special neat insulating covers had been made to protect the rotor blades against the great heat whilst standing in the sun. The sun temperatures in the Sudan are so high that after mid-day all metal parts can no longer be touched, and maintenance outside a hangar becomes impossible.

As soon as the air tests were completed the spraying trials with the helicopter gear, known as "Spray-copter Mark I," commenced on October 14th on the cotton plantations of the Sudan Plantations Syndicate, and flights at various heights using the same technique as in crop spraying in U.K. were carried out. The spraycopter gave a very good performance and counts carried out on the mortality of the cotton pests showed that the reduction of pests achieved was equal to that achieved by tractor driven power spraying machines.

Messrs Pest Control have a fleet of 14 large ground spraying machines working in the Sudan where they had very much increased the cotton production through the control of a small insect called "Jassid," which causes the so-called hopper burn. This is by far the biggest campaign for the control of pests on agricultural crops in tropical Africa and incidentally, was the first chemical control operation of any agricultural pest in Africa and was pioneered at the instigation of the Sudan Government in 1945.

As soon as the trials with the aircraft flying very low over the crop started, the biggest danger to helicopter spraying in Sudan became evident. Birds feeding in the crop rose when the helicopter was overhead and were hit by the rotors. The first bird so hit was a swallow which was of course killed, slightly denting the leading edge of one of the rotor blades. As there are a great number of other birds, such as Ibises, flying out of the crop, the pilot had often to take evading action. The most dangerous, of course, are the big carnivorous birds which soar up and make no attempt whatsoever to avoid the aircraft. When Mr Harper was asked his impression after the first crop spraying flight he said, "The Spraycopter performance is good and I don't mind hitting the small birds very much, but I do dislike the five tonners!"—by which he meant the big vultures, of which there are a great number in the Gezira.

Another danger, particularly when landing or operating with very low forward speed, are the "Dust Devils." These circular winds travel very fast over the ground and are particularly dangerous on cotton plantations near the desert. Other difficulties are the big dust clouds raised by the slipstream of the landing helicopter which sometimes completely obscure the vision of the pilot.

After the entomologists of the Government Research Station and Messrs Pest Control had satisfied themselves that the control of the cotton pests was adequate, a demonstration was staged for the Sudan Government on the 18th October near Messrs Pest Control's headquarters at Turabi in the Blue Nile Province. The demonstration was attended by His Excellency The Governor General, The Deputy Director of Agriculture, The Financial Secretary, The Governor of the Blue Nile Province, and many other leaders of the country.

With the successful conclusion of this demonstration the Spraycopter commenced large scale spraying operations scheduled to last over a period of several months and which are still in hand.