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QUELEA CONTROL OPERATIONS IN TANZANIA

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ABSTRACT

Ever since the quelea became an economically important pest of cereal crops, many control measures have been used and dropped as they proved ineffective with time. Aerial spraying of quelea concentrations is hitherto the only practical means of control. Spraying operations are done together with a ground supporting team which seeks out quelea concentrations, maps their locations, and moves chemical and solvent to required areas. Aerial spraying for *Q. quelea* suffers from constraints which often impair its success.

INTRODUCTION

The red-billed quelea, *Quelea quelea*, is a serious bird pest of cereal crops in Africa. It occurs in at least twenty countries, where it damages millet, sorghum, rice, and wheat causing losses of variable severity. Often the losses are quite high (Manyanza, in press) and sometimes have resulted in or induced famines in some parts of Africa (Disney and Marshall, 1956; Haylock, 1959). In Tanzania quelea are thought to do damage costing U.S. \$2.4 million annually (Feare, 1982).

Damage by the noxious *Q. quelea* existed for many decades before economically important damages were reported about thirty years ago following increased cereal production in many parts of Africa. It was at this time that the problem attracted world-wide attention, and scientists began seriously to look for means of quelling the problem. The traditional scaring method, which involved shouting and beating noise-making devices such as scraps of metal, could not cope with increased farm acreage. More rigorous methods were used, including the use of improved noise-making devices, banding chemicals, explosives, and poisons (Fuggles - Couchman, 1952; Haylock and Disney, 1956).

Aerial spraying is so far the only practical means of controlling *Q. quelea*. Contact poisons (avicides) dissolved in dieselene, which acts as a carrier by penetrating the bird's feathers, are sprayed by air at dusk or dawn when birds are at their roosts. The currently used avicide is fenthion (dimethyl 3 methyl-4-methylthiophenyl phosphorothionate) or queletox. This paper outlines how quelea control operations are carried out in Tanzania, one of the most affected countries, and highlights the problems involved. Figure 1 shows the extent of the quelea problem in Tanzania. Basically these operations are similar throughout Africa.

In Tanzania two organizations are concerned with the quelea problem. The Tropical Pesticides Research Institute (TPRI) carries out research on quelea control. It is concerned with migration and chemical (avicide) application in relation to quelea control. There is another organization, the National Bird Control Unit (NBCU), which carries out routine control. Close collaboration exists between TPRI and NBCU. Presently NBCU is partly funded by UNDP/FAO.

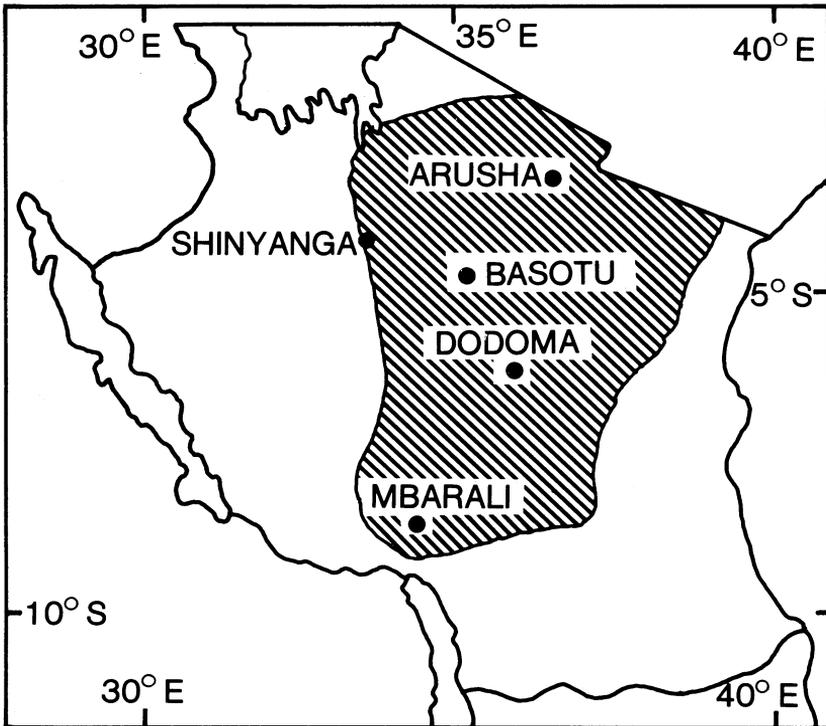


FIGURE 1. Map of Tanzania showing the extent of the Quelea problem and time of arrival of Quelea birds. Mbarali (February), Dodoma (February/March), Shinyanga (March/April), Basotu (June), Arusha (August).

METHODS AND MATERIALS

Off-season Activities

Off-season is the period when queleas are not causing damage. In this period of about six months from September to February, queleas either feed on leftovers at harvested farms or dry grass seeds on the ground in areas where the entangled grass mass has been opened up by grazing animals. This is also the period when queleas migrate to other parts in eastern Africa in pursuit of areas with adequate food stores.

For the National Bird Control Unit, the unit which solely carries out quelea control operations, this is the period to service vehicles and compile operation reports. Members of staff may also go on leave during this time. Towards the end of the off-season period (in January) rainfall surveys are made in those areas where the birds normally appear in order to prepare for their arrival.

Arrival of Quelea Birds

Q. quelea migrate at the beginning of the wet season, away from their dry-season concentration areas and towards areas where rain has started several weeks earlier (Ward, 1971). Arrival at their destination is sudden and always coincides with availability of mature grass seeds upon which they rely for their food before cereal crops are ready for eating once they reach milky stage.

In Tanzania, first arrival of quelea birds is in January/February. This usually takes place in Mbeya (at Mbarali), southern Tanzania, where anything between 200,000 and one million birds start breeding (pers. obs.). The birds at Mbarali often do not cause

damage to rice until about mid-February to March, by which time birds have also arrived in central Tanzania, the major breeding ground in the country. In June the birds are in northern Tanzania, where they depart across the country's border in November/December.

Control

Control of *Q. quelea* is by aerial spraying. Millions of birds are killed annually in aerial spraying operations. However, the control of *Q. quelea* needs preparation before actual aerial spraying begins. Queletox and diesolene (solvent) must be moved to an operation base where quantities depending on the work envisaged are stored. Both avicide and solvent are transported by lorry in 200-litre drums. A team of field officers and bird scouts operates from this base and searches for quelea concentrations. Close liaison is maintained between this team and farmers to locate these concentrations, which are in the form of either colonies or roosts. The team may also clear airstrips if they are needed in new areas or maintain existing ones.

Searches for quelea concentrations involve travelling in the bush. Vehicles (often landrovers) in good condition are needed for this job. Where vehicles cannot move due to either bush or swamp, searches may be done either by helicopter or on foot. Once concentrations have been found, their areas are estimated, marked, and population estimated. Marking the area is very important, as this is the only way a spray pilot will locate it. Marking is done by flagging white cloth conveniently at four corners of the area.

Either an aircraft or helicopter is used for spraying and may be fitted with either boom and nozzles or micronair. Chemical and solvent are transported from a base to an airstrip, where the chemical and solvent are mixed in a spray tank of either an aircraft or helicopter. The concentration of queletox usually used is 25%. The height above roosts or colony of the spraying aircraft varies, being influenced by the nature of vegetation. Tall trees surrounding or found with the site cause the pilot to spray high. Spraying as low as possible often has very good results. Droplets used vary considerably; 120 to 200 μ VMD are used with 10 to 15 litres of chemical being applied per hectare. Spraying, although more often done at dusk, may also be done at dawn; it is done when it is dark enough for the birds not to fly away but not too dark for the pilot. Kill is assessed the next morning by either estimating the population left or counting the number of dead birds in randomly selected areas.

PROBLEMS

Marking still provides considerable problems as the white cloth may not be easily visible when it is dark. This has occasionally resulted in missing the target areas and spraying unoccupied areas. It is not yet possible to forecast precisely the outbreak of quelea birds. They appear suddenly, sometimes irregularly, and in such large numbers that considerable damage to crops always results before the situation is contained. Some aspects of the control operations have not been researched because of limited facilities and funds at TPRI. For example, the idea of lowering the droplet size used in quelea control is attractive. Even if it would not be possible to use small droplets entirely during control operations because of problems of drift, specific circumstances under which small droplets could be applicable would be isolated. This is an area open for collaboration with overseas scientists.

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