



# Red-billed quelea damage to cereals

*Quelea quelea*



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*Juvenile, female and male red-billed quelea.*



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*Local measures taken by farmers to scare birds are useful but not enough to prevent losses caused by major irruptions.*

**SUMMARY:** The red-billed quelea is a small brown weaver bird that can occur in huge flocks. The world's most abundant wild bird, quelea are found only in Africa, especially in semi-arid zones. They are seed-eaters, both of wild grasses and cereals such as sorghum, rice and wheat, but also eat insects, including pests of crops. Estimated annual damage to crops of up to US\$80 million has been recorded across Africa, and it is said to be the most important crop pest in Africa. Quelea attack crops when other natural food sources are exhausted. Rainfall linked to germination of wild grass seeds is used to predict likely growth in flocks and to plan early control interventions. Control methods include spraying fenthion, an organophosphate, but this also kills non-target birds and the pesticide needs careful handling. Other methods with fewer side-effects include fire bombs and dynamite. Large-scale control efforts need area-wide coordination, farmer cooperation and adequate funds. Control methods used by smallholders range from scaring tactics and physical barriers, to home-made weapons (e.g. catapults) and can be locally successful if the threat of bird damage is relatively low.

## KEY SIGNS

Quelea are abundant and widespread in their semi-arid habitat. Drab in appearance, they have a distinctive red bill. They are small, between 11 and 13 cm long when adult, and weigh about 15-20 g. Individuals can eat up to 10 g of seed in a day. Huge populations of birds occur when conditions for breeding are favourable.

The presence of quelea does not always mean that they are a threat or indeed responsible for major crop losses. The threat depends on availability of natural food supply while poor growth of crops could have many causes. Even when quelea do attack small grain crops, some farmers suffer more losses than near neighbours. Large scale production of small grain crops presents a more vulnerable target.

## MANAGEMENT

**Prevention** – what to do before signs are seen

*Cultural approaches:* The nature of the risk from quelea attack needs to be carefully assessed before committing money and time to control programmes that may not be as necessary as first thought. Money and effort may be best spent in population reduction rather than direct control in fields, a decision made in the 1980s in Kenya. Current strategies here and in other countries are difficult to assess given an apparent lack of published information.

Timing of planting and selection of different crops can reduce the risk of quelea damage. Smallholders may have limited

flexibility to delay planting or to grow alternative, non-cereal crops.

Small plots of cereals can be protected from quelea by scaring tactics, including banging and loud noises. Scarecrows should be placed at several places in a field to be most effective. Physical barriers, such as string and streamers, may also work though entail too much work or expense to be practical. In areas where quelea are a threat to smallholders it makes most sense to ask farmers what methods they have already tried, and with what level of success, before making final recommendations.

Predictive models were used in South Africa from 2002 to 2008 for the migration and breeding of quelea. The model was based on satellite-derived rainfall estimates and how this would affect the germination of natural grasses, the favoured food source of the bird. The aim was to give early warning of potentially damaging large populations of quelea. The forecasts were highly accurate though the model is no longer available.

**Control** – what to do after signs are seen

*Cultural approaches:* Trapping birds will reduce damage if populations of birds are low. Birds can be eaten, though this does not happen in all countries where quelea are abundant.

*Chemical approaches:* Chemical control targets breeding colonies of quelea, a strategy known as 'search and destroy'. Fenthion, an organophosphate pesticide, is commonly used in aerial spraying and from vehicle-mounted machines to kill the birds. The chemical needs careful handling and will also kill non-target birds. Chemical control is said to be less efficient than fire-bombs and dynamite, two other methods that usually require government or third party funding.

## CAUSE

There are four species of quelea, of which *Quelea quelea* is the only major pest. Quelea are passerine (perching) birds and belong to the Ploceidae family. Known collectively as weaver finches, birds in this family produce typical hanging nests in trees, woven from straw and small twigs. Quelea pairs breed up to three times a year. Their ability to migrate long distances in search of food and new breeding grounds makes quelea a particularly difficult pest to control.

There are an estimated 170 million birds in southern Africa alone. A total population of 1.5 billion breeding pairs make quelea reportedly the most abundant wild bird in the world.

Quelea feed preferentially on wild grass seeds. The abundance of wild grass seeds is often patchy and, even though the birds work cooperatively to locate natural food sources, easier alternatives may be preferred. Quelea will eat grains of sorghum, millet, rice, teff, wheat and other small-sized cereals and cause enormous amounts of damage. They do not eat large seeds, such as maize grains or chickpeas. The birds migrate long distances to new areas with potential food (and water). Quelea also eat insect pests and therefore have 'good' features in addition to their notorious role as perhaps the most damaging crop pest in Africa.

The reasons why quelea shift from eating natural grass seeds to cereal crops appear to vary and so it can be difficult to predict when the bird is likely to become a major pest, even when large colonies can be readily observed. Damage can also be spatially uneven, with some farmers worse affected by feeding damage than close neighbours. Caution is needed in deciding when and to what extent large-scale control programmes should be implemented. There is also the danger of ascribing all crop losses to quelea when other things, such as low soil fertility and other pests and diseases, may be responsible for reduced production.

## IMPACT

Reported losses include US\$80 million per annum across Africa: 13% of rice production loss in the River Senegal valley each year; 50% loss of crop production in fields attacked by quelea. Note that overall losses on a national scale may be relatively small, no more than 5% as one source suggests, but that this will mask many cases of small-scale farmers losing all their major crop production.

## DISTRIBUTION

The quelea is a sub-Saharan species. It is found from East Africa to South Africa. It occurs from Senegal in West Africa across the semi-arid zones towards Nigeria and then east towards Ethiopia and Somalia, but no further north, and down to South Africa.

## FURTHER READING

Crop Protection Compendium ([www.cabi.org/cpc](http://www.cabi.org/cpc)) and Plantwise ([www.plantwise.org](http://www.plantwise.org)) for technical fact sheet.

There are many published sources of information on quelea, available via a basic Google search. The University of Nebraska holds proceedings of bird control seminars held from 1964 – 1983 at <http://digitalcommons.unl.edu/icwdmbirdcontrol> from which various papers on Quelea can be accessed. For example: Erickson WA (1979) Diets of the red-billed quelea (*Quelea quelea*) in the Awash river basin of Ethiopia. Bird Control Seminars Proceedings, paper 25. Other quelea papers are available at <http://digitalcommons.unl.edu/vpcthirteen>

Ornithology sites may contain useful observations about quelea which help in formulating local control strategies. For example: [www.natureuganda.org](http://www.natureuganda.org)