

# Eradicating tsetse flies: Senegal nears first victory

By Aabha Dixit

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— Loulou Mendy,  
farmer, Niayes, Senegal

After a four-year eradication programme including nuclear techniques, the Niayes region of Senegal is now almost free of the tsetse fly, which used to decimate livestock.

“I have not seen a single tsetse fly for a year now,” said cattle farmer Oumar Sow. “This is in contrast to earlier, when they increased in numbers, especially during the cold season. The flies were really a nuisance to our animals and we had to carefully select the time for milking. Now, there is no problem with that.”

has suppressed the fly population by 98 per cent in two of the three areas in Niayes infested with tsetse, while the technique will be implemented in a third area next year, said Baba Sall, Project Manager at Senegal’s Ministry of Livestock and Animal Production. Eradicating the flies will significantly improve food security, and contribute to socio-economic progress, Sall said, adding that research on 227 farms has indicated that the income of the rural population in Niayes will increase by 30 per cent.

Life has become more comfortable not only for the animals, but also for the farmers, said Loulou Mendy, a pig farmer in the area. “Now, we can even sleep out in the open,” he said. “This was unthinkable before because of the tsetse bites.”

One of the 38 African countries infested with the tsetse fly, Senegal has a total infested area of around 60 000 km<sup>2</sup>, Sall said. The operational phase of the campaign against the tsetse fly started in the Niayes region near the capital Dakar in 2011. Situated on the West Atlantic coast, made up of the remnants of Guinean forests, with the African oil palm as its main vegetation, Niayes has a coastal microclimate and ecological conditions that are favourable to the tsetse fly, *Glossina palpalis gambiensis*.

This region was selected by the Senegalese Government, as it is particularly suitable for breeds of cattle that produce more milk and meat than cattle in other areas. However, the high incidence of livestock infertility and weight loss, due to nagana, resulted in reduced meat and milk production, and cattle that were too frail to plough the land or transport produce, which in turn severely affected crop production, said Marc Vreysen, Head of the Insect Pest Control Laboratory at the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture.

## Previous eradication attempts

Prior eradication campaigns were carried out in the Niayes region from 1971 to 1981, leading to a decrease in tsetse flies for a



## Deployment of a tsetse trap to monitor the progress of the eradication campaign in the Niayes of Senegal.

(Photo: M. Vreysen/Joint FAO/IAEA Division)

The tsetse fly is a bloodsucking insect that kills more than three million livestock in sub-Saharan Africa every year, costing the agriculture industry more than US \$4 billion annually. The tsetse fly transmits parasites that cause a wasting disease called nagana in cattle. In some parts of Africa the fly also causes over 75 000 cases of human ‘sleeping sickness’, which affects the central nervous system, and causes disorientation, personality changes, slurred speech, seizures, difficulty walking and talking, and ultimately death.

## Eradicating reproduction

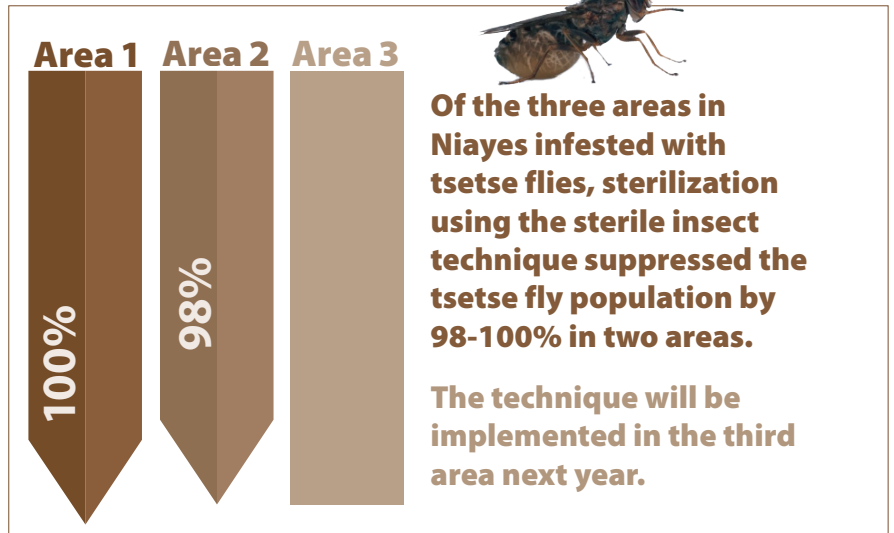
Senegal has successfully integrated an insect birth control technique using irradiation to sterilize male flies, reducing the fly population over time (see box). The technique



decade, said Sall, but the re-emergence of this pest in 2003 has had severe repercussions for livestock and farmers' livelihoods since. Research revealed that previous eradication attempts were unsuccessful because the campaigns did not manage to reach the entire tsetse fly population in the area, leaving residual pockets from which the tsetse population could recover.

Sterilization using nuclear techniques is most effective under exactly these circumstances: when the fly population has been reduced significantly using conventional techniques but there are still pockets of insects left, Vreysen explained. "The sterilized male flies will seek out the virgin females wherever they are," he said. "This will lead to complete elimination of the population in these areas."

The project in Senegal started with a feasibility study initiated in 2006, supported by the IAEA, the Food and Agriculture Organization of the United Nations, the International Cooperation Centre of Agricultural Research for Development (CIRAD), and the Government of Senegal through the Senegalese Institute for



Agricultural Research and the Directorate for Veterinary Services to assess the possibility of creating a tsetse-free zone in the Niayes region. This four-year study found that 28.7 per cent of cattle had devastating health problems due to the tsetse fly.

The release of sterile male flies began in 2012, after a three-year period of pilot trials, training, preparation and testing.

## THE SCIENCE

### Birth control for flies

The sterile insect technique (SIT) is a form of pest control that uses ionizing radiation to sterilize male flies that are mass-produced in special rearing facilities. The sterile males are released systematically from the ground or by air in tsetse-infested areas, where they mate with wild females, which do not produce offspring. As a result, this technique can eventually eradicate populations of wild flies. The SIT is among the most environmentally friendly control tactics available, and is usually applied as the final component of an integrated campaign to remove insect populations.

The Joint FAO/IAEA Division supports about 40 SIT field projects delivered through the IAEA technical cooperation programme, like the one in Senegal, in different parts of Africa, Asia, Europe and Latin America. It has supported the successful eradication of the tsetse fly from the island of Unguja, Zanzibar; in Ethiopia it has reduced the fly population by 90 per cent in parts of the Southern Rift valley.



**Aerial releases of sterile male tsetse flies over the Niayes using a gyrocopter.**

(Photo: J. Bouyer/CIRAD)