

## CROP PROTECTION IN TURKMENISTAN

Graham Matthews from the International Pesticide Application Research Centre (IPARC) at Silwood Park in the UK reports on a recent trip to Turkmenistan as part of a TACIS EU funded project

### Introduction

Turkmenistan is a former Soviet republic in west-central Asia, bordering Kazakhstan, Uzbekistan, Afghanistan and Iran. It is located in a broad, dry lowland extending east from the Caspian Sea; nearly 80% of the country is taken up by the Kara-Kum (Black Sand) desert.

### Agriculture

Agriculture accounts for almost half the value of Turkmenistan's economic production. Cotton, the chief crop, occupies more than 50% of the farmland. Other farm products include grains, grapes, potatoes, wool, and *Persian lamb* (a fur taken from young lambs). Some Turkmen raise camels, Karakul sheep, and a special breed of Turkoman horses. Pelts from the Karakul sheep are highly prized for fur coats. Some farmers also raise silkworms.

Farms depend on melting snows of the Pamir mountains feeding the Amu Darya and Syr Darya rivers. Part of the flow along the Amu Darya has been diverted to the Karakum canal, that stretches 750 miles across southern Turkmenistan, towards the Caspian Sea. Although the building of the canal has been severely criticised, due to the consequent ecological disaster of the shrinking of the Aral Sea, its development was planned to vitalise farming and living conditions in Turkmenistan. Crops in Turkmenistan can only be grown by irrigation and hence most of the farming regions in Turkmenistan lie along the Amu Darya river and the Karakum Canal. Currently the Murgah river is virtually dry due to the drought in Afghanistan, so farms in the Mary velayat depend on the canal water.

### Insect control

Insecticides are not widely used today in Turkmenistan. The extremely cold winters undoubtedly reduce the severity of most potential insect pests in the large areas of wheat, cotton and lucerne grown in the desert under irrigation. Despite the cold winter important beneficial insects thrive there in the absence of large-scale insecticide use. Biological control is being used in many areas. For example golden eye (*Chrysopa*) is a common lacewing keeping aphid and thrips populations in check. Coccinellids also play a key role in biological control. If the cotton bollworm *Helicoverpa armigera* population increases, farmers can get *Trichogramma* and/or *Bracon* parasitoids from bio-laboratories for release in cotton (see *Pesticide Outlook* 1993, 4(45), 36); however the equipment at these bio-laboratories has declined over recent years.

### Disease control

The main market for pesticides is fungicidal seed treatments as cotton seedlings are prone to disease, especially when growth is slowed by low night-time temperatures. Bronocol is the main ingredient used.

### Weed control

Frequent passage of tractors with harrows for mechanical weeding leads to soil compaction affecting crop development, so there is a potential for increased herbicide use. So far the small quantity of herbicides imported is applied on wheat, but many fields have large infestations of grass weeds (e.g. *Cynodon*, *Echinochloa*) as well as *Amaranthis* and *Convolvulus*.

### Application

There is virtually no information available locally on spraying techniques, use of different nozzles or sprayer calibration. In many areas, only old Russian sprayers are available, but if a sprayer is required the large farms on the etraps (administrative regions) can use one from the local mechanisation centre. Some have relatively new, high-clearance, self-propelled John Deere sprayers, while others have trailer units. Spray volumes applying herbicides are typically about 300 l ha<sup>-1</sup>. While at the end of the winter crop season in heated glasshouses, much higher volumes of an insecticide spray are used in May and June to try and prevent whiteflies migrating from tomatoes to nearby cotton fields. The use of defoliant has declined with a return to hand picking due to the deterioration and lack of spare parts of Russian mechanised pickers.

### Outlook

With sensible integration of certain pesticides and maintenance of biological control, it should be possible to increase yields, provided sufficient water is judiciously applied at critical stages of crop development.

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