Control of *Emex*, *Tribulus*, and *Cenchrus* in vineyards

Proceedings of a workshop held at Mildura, Victoria, 13-14 August 1990, on control of *Emex australis* Steinheil (three-cornered jack), *E. spinosa* [L.] Campdera (lesser jack), *Tribulus terrestris* L. (caltrop), and *Cenchrus longispinus* [Hackel] Fernald (spiny burr grass).

Editor: G.A. Buchanan
Sunraysia Horticultural Centre
P.O. Box 905, Mildura, Vic. 3502

Opening Address: The problems caused by weed seeds to the dried vine fruits industry.

R.B. Johnstone, Dried Fruits Research Council, P.O. Box 154, Irymple, Victoria 3498, Australia.

Summary

The seeds of *Emex*, *Tribulus* and *Cenchrus* are an important and difficult problem for the dried vine fruits industry. This workshop was requested by Dried Fruits Research Council to document the available information on control of the weeds, and to identify short and long term strategies for their control.

Introduction

This workshop on spiked weed seeds affecting the dried fruits industry is a result of a specific request from the Dried Fruits Research Council to the Department of Agriculture and Rural Affairs. Its purpose was to seek remedies to a very expensive industry problem, which is the elimination of the seeds of *Emex*, *Tribulus*, or *Cenchrus* from dried vine fruit. This workshop will concentrate on potential solutions to infestation by weed seeds at the very beginning of the production line - that is on the properties where fruit is grown and dried.

Fortunately, the Australian method of drying fruit on racks or on the vine trellis minimizes the risks of fruit coming into contact with weed seeds, dirt or other potential contaminants. This contrasts with some other dried fruit producing countries, where fruit is dried on the ground. The high quality and cleanliness of the Australian fruit must be maintained, and preferably improved through application of new technology to keep our competitive edge in world markets.

The weeds that are dealt with in this workshop are common problems in the grape-producing areas of the world. Three-cornered jacks, lesser jack, and/or caltrop are present through the South African, Middle East and Mediterranean regions, while caltrop has been an important weed problem in California. The ecology of the weeds in these areas, and the potential of biological control agents are of particular relevance to Australia. It is pleasing to have scientists with practical experience in these matters contributing to the workshop.

To achieve this workshop's objectives we need to understand the ecology and control of these weeds. *Emex* and *Tribulus* can become abundant in Sunraysia vineyards, if they are not controlled. There is the potential for seeds to contact the product in many ways, from the picking containers to ground sheets on the drying green.

The pressure to increase efficiency of production from our land sometimes results in improved growing conditions for weed plants. In recent years the increased frequency of sprinkler irrigation and reduced soil cultivation has led to increased weed growth. The increasing distribution of *Tribulus* in non-crop land throughout Sunraysia provides a seed source threatening properties which are not yet infested.

The problem of weed seeds is one that needs to be overcome in the vineyard. The industry has investigated machines designed to detect and remove contaminants from fruit, but the results have been disappointing. Some industry packers have recently achieved positive improvements in their processing and cleaning technology. Growers have plenty of incentive to control weeds on their properties, as severe financial penalties are levied on deliveries of fruit containing seeds at the time of receival by packing sheds. The Victorian Dried Fruits Board carries out annual inspections of drying greens and can supply control equipment including a prickle roller which gathers and removes surface seeds. The DFRC funded a project which investigated growers' attitudes to spiked weed seeds.

Dried fruit growers have varying levels of management skill and dedication to progressive production methods. There is concern that constant clean cultivation will destroy any structure left in our soils. We are living in a world which shows increasing resistance to the use of chemical herbicides.

We have for this workshop the input of knowledgeable and accomplished people. We aim to produce documents outlining immediate recommendations and new research priorities in the subject areas of ecology, biological control, chemical control, cultural control and quality assurance. There are many people we expect will be able to use the documents from this workshop. These include extension workers, growers, agribusiness and researchers.

We seek to harness the best skills of this group in a way that will be of lasting benefit to the Australian dried fruits industry.