

THE EFFECT OF WEEDS ON SUGAR-CANE CULTURE

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Weeds in or adjacent to cane fields can cause problems in four aspects of crop production:

- (a) yield;
- (b) harvesting;
- (c) pest incidence;
- (d) disease control.

(a) Yield

When optimum growth conditions for sugar cane exist in Queensland, weeds have little or no effect on yield. However there are some exceptions to this, the most notable being yield reductions associated with heavy infestations of Guinea grass (*Panicum maximum*) and loss of photosynthetic activity caused by heavy growth of vines, e.g. *Ipomoea* spp., *Convolvulus* spp. and *Merremia* spp, that bind the cane foliage and cause crop lodging.

When growing conditions are not favourable, appreciable yield reductions can be caused by weeds. Examples of this include nutgrass (*Cyperus rotundus*) competing for moisture under dry conditions, para grass (*Brachiaria mutica*) competing for nutrients under wet conditions and summer grass (*Brachiaria miliiformis*) and crow's foot grass (*Eleusine indica*) competing for light and nutrients with young plant cane under wet conditions.

(b) Harvesting

Pre-harvest burning of the crop is an established practice in Queensland cane fields and for ideal harvesting conditions it is essential that the burn remove all but the cane stalk. Weed-infested fields (especially those with vines or dicotyledons) tend to carry a fire less readily than weed-free fields, so the harvester has to handle weeds and the cane foliage left unburned by the poor fire.

Despite the sophistication of cane harvesting machinery, woody stemmed weeds, e.g. *Crotalaria goreensis*, *Ageratum houstonianum*, *Jussiaea suffruticosa*, can choke the feeding mechanism and slow the operation. The weeds and the extra cane foliage also increase the amount of material to be handled and tax the efficiency of the mechanism for removing extraneous

matter. This increase in extraneous matter in cane delivered to the mill increases harvesting and transport costs, causes losses in sucrose during the milling process and most importantly reduces the return to the grower.

(c) Pest incidence

Weeds that provide harbourage for pests and insects are a major problem in cane fields. The two major rat species damaging cane (*Melomys littoralis* and *Rattus conatus*) both build their nests in grass growing in or near cane fields. Losses due to rat damage are still high in North Queensland despite vigorous poisoning campaigns. Removal of grass harbourage would appreciably help control of rats.

Armyworms (*Pseudaletia separata* and *Leucania loreyimana*) and locusts (*Austracris guttulosa*) both develop and initially feed best in grassy situations and periodically attack the crop. During a year of moderate to high population build-up by these insects, weed-infested fields always suffer the most damage.

(d) Disease control

A few of the major and several minor sugar cane diseases can infect some grasses commonly found in and around cane farms. Transmission from grass to cane has been obtained experimentally in most cases, but field spread has been demonstrated in fewer instances. Infected grasses have acted as disease reservoirs after the disease has been eradicated from cane; as examples, chlorotic streak disease occurs in elephant grass (*Pennisetum purpureum*); leaf scald in blady grass (*Imperata cylindrica*); mosaic in wild sorghum (*Sorghum verticilliflorum*); bacterial mottle and sclerophthora diseases in para grass (*Brachiaria mutica*) and Guinea grass (*Panicum maximum*). The latter two are diseases of several naturally occurring grasses and under flood conditions, sugar cane is just another grass available for infection.

The relative effect of weeds on sugar cane varies from district to district but in wet tropical areas the problem is intensified.