Weed management

Weed management consists in removing the weeds that compete with the banana plant for resources and favour the development of parasites. Controlling weeds is particularly important in the first few months after plantation when the banana plants are small and there's little shade. In commercial plantations where banana plants are grown on bare soil, sowing a ground cover can reduce the use of herbicides.

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Chemical control

The use of herbicides to control weeds dates back to the 1970s. But herbicides are not only toxic, there also persist in the soil. Moreover, their uncontrolled use can lead to soil erosion, loss of organic matter and a reduction in the soil's biological activity. In the 1980s, certain production zones along Costa Rica's Caribbean coast had to be abandoned because of that reason. Herbicide use is now better controlled. Applications should be conducted at the most appropriate time and respect the recommended doses.

Herbicides

Two types of herbicides are used in commercial plantations: contact herbicides (e.g. paraquat) and systemic herbicides (e.g. glyphosate, glufosinate ammonium).

Contact herbicides only destroy the plant's aerial parts that come in contact with the product. They will eliminate annual plants, but since the root system is not affected, perennial weeds will grow back. The volume needed is also high (200 to 400 liters per hectare). They are best used at the beginning of a production cycle.

Systemic herbicides destroy the entire plant and the volumes needed are lower, a maximum of 100 liters per hectare. Systemic herbicides are recommended for established plantations.

Herbicide application

The herbicide should be applied in a fine layer when the climatic conditions are favourable and
before the weeds have started producing seeds. The equipment must be in good condition and calibrated. It's important to be precise to avoid spraying the banana plants, the naked soil or the useful cover crops.

Backpack spayers are the most commonly type of equipment used. They are especially useful to reach hard-to-access areas. Drift and an uneven distribution of the herbicide are more common with sprayers in which the pressure is maintained by operating a hand pump, than with sprayers that can maintain a constant pressure.

A combustion engine backpack sprayer or a pressure regulating nozzle can ensure a constant pressure and improve the efficiency of the application. Low-volume sprayers can distribute pur or concentrated products, thereby reducing the volumes applied.

The drop size can have an effect on several parameters. Large drops reduce drift and evaporation. Small drops, on the other hand, have a better penetration. The type of nozzle will affect the spray angle, the droplet spectrum, the drop size, drift, the operating pressure and the type of herbicide.

<table>
<thead>
<tr>
<th>Type of nozzle</th>
<th>ADI drift reduction nozzle</th>
<th>CVI anti-drift nozzle</th>
<th>AVI anti-drift nozzle</th>
<th>APM ceramic inserted deflector nozzle</th>
<th>ATR hollow cone nozzle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spray angle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Droplet spectrum</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Drop size</td>
<td>Medium 300-400 µm</td>
<td>Large 400-600 µm</td>
<td>Large to very large 500-600 µm</td>
<td>Very large &gt;600 µm</td>
<td>Fine &lt;150 µm</td>
</tr>
<tr>
<td>Drift</td>
<td>Low</td>
<td>Very low</td>
<td>Very low</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Recommended pressure</td>
<td>2-4 bar</td>
<td>1.5-3 bar</td>
<td>3-5 bar</td>
<td>1.3 bar</td>
<td>3-20 bar</td>
</tr>
<tr>
<td>Contact herbicide</td>
<td>Excellent</td>
<td>Good</td>
<td>Good</td>
<td>Excellent</td>
<td>Excellent</td>
</tr>
<tr>
<td>Systemic herbicide</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Good</td>
<td>Good</td>
</tr>
</tbody>
</table>

**Selective chemical control**

Instead of applying herbicide indiscriminately, the operator can target which plant to remove and which to maintain. This practice not only reduces the volumes of herbicide applied, it also favours the establishment of a natural plant cover that will not interfere with the banana plants. Examples of such species are *Geophila macropada, Galactia striata, Evolvulus nummularis* and *Murdania*.
nudiflora. This cover will provide services such as reducing erosion and leaching, or limit the development of weeds that may compete with the banana plants or be hosts to pests and pathogens.

**Manual and mechanical weeding**

Manual weeding is labour intensive but requires little equipment. Besides being slow, it can damage the banana plant, transmit pathogenic bacteria or contribute to weevil build-up. Weeding should start one meter away from the pseudostem to avoid damaging the plant.

Mechanical weeding is possible in plantations in which the bananas have been planted in double rows. Having a larger alley allows mechanization. Using light equipment prevents soil compaction. There is a need to develop equipment better adapted to more environmentally-friendly situations.

**Cover crop**

*Main page on cover crop*

Weeds can also be controlled by planting a ground cover that will prevent the growth of weeds without negatively impacting banana yields[^13]. Some of these species can also have an allelopathic effect[^4][^5].

**References**


**Further reading**

*Control de malezas en plantaciones bananeras mediante el uso de coberturas nobles* produced by Augura, Colombia's association of banana producers.

**Also on this website**

Musapedia pages on pesticide-reducing practices:
- Bagging
- Biological forecasting system for black leaf streak
- Biological forecasting system for Sigatoka leaf spot
- Cover crop
- Crop rotation
- Deleafing
- Fallow
- Fungicide-reducing application technologies
- Integrated nematode management system
Pheromone trapping
Weed management

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