Cover crop

A cover crop (also called ground cover or cover plant), is a crop planted to manage soil erosion, soil fertility, weeds and/or pests, and thereby reduce the use of herbicides and pesticides. The practice consists in planting a species that does not negatively impact banana production and prevents the growth of weeds. These could be domesticated crops or local species. Bananas can also be planted on the mulch of a previous cover crop (such as Brachiaria decumbens or Crotalaria). The mulch will limit the growth of weeds and protect the young banana plants.

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Methodology

When establishing a new plot, the cover crop should tolerate light and not compete with banana plants.

Choice of a cover crop

A good cover crop for a banana plantation should possess many of the following characteristics:

- Creeping or short-stature.
- Fast-spreading (invasive).
- Complementary root system (e.g. nitrogen-fixing roots or deep roots that can capture water and nutrients not accessible to the banana plants).
- Non-host of banana pathogens.
- Does not compete for resources such as water, light and nutrients.

Examples of cover crops

Nitrogen-fixing leguminous plants: Pueraria phaseoloides, Desmodium ovalifolium, Centrocema spp., Stizolobium deeringianum, Stizolobium niveum, Stizolobium aterreum, Canavalia spp., Stylosanthes guianensis, Arachis pintoi (tolerant to humidity and shade but host to nematodes), Neonotonia wigthii and Galactia striata.

Other species: Drymaria cordata[^1], Teramnus volubilis, Melothria guadalupensis, Geophilia
macropoda (host of nematodes), Vigna peduncularis (moderate tolerance to shade and cold, good weed control), Murdania nudiflora, Callisia cordifolia, Cleome rutidosperma, Paspalum notatum, Commelina spp., Evolvulus nummularius, Impatiens sp., and Brachiaria decumbens (provides a good ground cover, improves fertility as well as soil structure and its biomass can be used as fodder).

Benefits of a cover crop

- Protects the soil.
- Helps structure the soil.
- Provides organic matter.
- Reduces soil temperature and respiration.
- Produces growth-enhancing substances.
- Reduces nutrient leaching.
- Partially returns nutrients to the soil.
- Fixes nitrogen (when the cover crop is a leguminous)
- Buffers sudden changes in soil pH (when synthetic fertilizers are applied).
- Increases the soil’s biodiversity.
- Increases the soil’s mineralization through its decomposition.

Impact of a cover crop

In a field experiment conducted over two crop cycles, the impact of two grass covers, Cynodon dactylon and Brachiaria decumbens, was evaluated\[2\]. During the first cycle, both cover crops impeded the growth and development of the banana (a Cavendish cultivar). Compared to the control, the flowering date was delayed in both treatments and the number of fruits per bunch was reduced in the C. dactylon treatment. During the second cycle, as a consequence of the delayed flowering during the first cycle, banana development was also delayed. However, in both treatments, the presence of a cover crop had no influence on the size and weight of the banana plants at flowering, nor on final productivity. The authors interpreted the results as showing contrasted conditions of competition for nutrient during the two cycles: an important production of biomass and nutrient demand of the two cover crops during the first cycle, impacting banana growth and delaying flowering, and a lower biomass production of both covers crops shaded by the banana canopy and a contribution to the nutrient supply provided by the decomposition of the mowed residues, during the second cycle.

References

1. Factsheet on Drymaria cordata (PDF 4MB) produced by the Institut Technique Tropical as part of its Manuel du Planteur.

Also on this website

Related stories:
- Pesticides out, biodiversity in
- Agroecology and the banana: from theory to practice
- With a little help from (functional) biodiversity
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

Further reading

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

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The original document is available at http://www.promusa.org/Cover+crop