BRACHIARIA DECUMBENS CV. BASILISK
SANITIZING FALLOWS AND IMPROVED SOIL STRUCTURE

1. AGRICULTURAL BENEFITS

1.1- Nonhost of the main banana parasites
- Sensitivity tests have shown that *Radopholus similis* and *Pratylenchus coffeae*, the two main banana nematodes, do not propagate on *B. decumbens*.

1.2- Soil fertility remobilizing and soil restructuring ability
- *B. decumbens*, through its high capacity to extract soil nutrients, has very high biomass production (over 25 t dry matter [DM]/ha for above-ground parts, and 5 t DM/ha for roots). This enables rapid carbon uptake in the surface horizons and directly in deep horizons, thus sustainably enhancing soil fertility and structure.

1.3- Rapid and effective soil cover/anti-erosion function
- This grass, because of its vigour, rapid growth and ability to multiply vegetatively, can outgrow weeds after 3 months of growth. Once it has grown to over 50 cm in height, stem lodging occurs and a mulch layer forms with live stems and dead leaves. It builds up during cultivation (up to 20 cm thick within 12 months), providing good soil cover and promoting water infiltration.

1.4- Excellent fodder
- It has a high feed value and palatability, making it excellent fodder.

2. INTEGRATION IN CROPPING SYSTEMS
B. decumbens is now recommended for sanitizing fallows in old banana plantations. This sanitizing feature is an enhancement over spontaneous fallows:

1. In old banana plantations, chemical control of banana trees by glyphosate injection in pseudostems and, if necessary, glyphosate sprays on the weeds present.
2. Rapid burying of banana residue and plant debris (use of a rototiller or disc plough, etc.).
3. Preparation of a seed bed, if necessary, using a circular spike harrow or disc plough.
4. Row seeding to ensure optimal cover using a mechanical seeder or by broadcast sowing, followed by rolling.
5. Emergence is checked 45 days after sowing, and the cover is checked after 3 months. Mowing to stimulate B. decumbens growth and promote optimal coverage without gaps.
6. Mowing of the cover at mid-fallow and then 6-8 weeks before control.
7. Chemical control 4-6 weeks before the planting of micropropagated plantlets, with a second herbicide spray 4-6 weeks later.
8. Hole planting of micropropagated banana plantlets in B. decumbens mulch (4-6 weeks after the first herbicide treatment).

3. PLANTING AND MANAGEMENT OF B. DECUMBENS COVER
(see diagram below)

3.1- When?
- Tillage and B. decumbens sowing should be done before the heaviest rainfall period. It is thus recommended that sowing be carried out between May and July, regardless of the approach used (manual or mechanical). Planting too late increases the erosion risk.

3.2- How?
- B. decumbens seeds are sown by two techniques:
  . Use of a mechanical seeder: seeds are preferentially sown in rows and then the seeds are lightly covered with soil (1-2 cm depth). The recommended sowing rate is 8 kg/ha.
  . Broadcast sowing: the seed quantity is the same (8 kg/ha), which is sufficient to obtain quite uniform grass cover.

Note: for both of these sowing techniques, it is essential to subsequently roll the field in order to bury the seeds just below the surface (1-2 cm). Some caterpillars may attack young B. decumbens shoots (observed in Nord-Atlantique and Centre regions of Martinique).

3.3- Cover management
- Weeds that break through the B. decumbens cover in the first months after sowing can be controlled by regular mowing, which in turn stimulates and enhances the B. decumbens cover. Urea applications after mowing can also favour B. decumbens domination. Persistent weeds will slowly suffocate, especially after a mulch layer forms at the base of the cover.
3.4- Seed treatment

- *B. decumbens* seeds require no insecticide or fungicide treatments. They should be stored under suitable conditions (dry environment and protected from high temperatures).

3.5- Fertilization

- This species is very well adapted to acidic soils. It can take up soil phosphorus from the soil, so throughout its growth cycle the only other nutrient it essentially requires is nitrogen. This element is supplied by decomposition of buried banana residue. A fertilizer application (50-150 kg/ha) could be carried out during the first months after sowing to promote its coverage.

4. CONTROLLING *B. decumbens* COVER

4.1- When?

- At least 12 months of cover is necessary to achieve optimal soil remediation. *B. decumbens* cover should be controlled 6-8 weeks after the last mowing and then, if required, after planting micropropagated plantlets.

4.2- How?

- It is important to mow the cover 6-8 weeks before chemical control, by scything. Then the *B. decumbens* cover is controlled with a glyphosate spray (6-8 l/ha). In case of subsequent regrowth, a second directed grasskiller spray is conducted at 2 l/ha dosage.

5. MICROPROPAGATED PLANTLETS PLANTED IN *B. decumbens* MULCH

- At the end of the fallow, the amount of mulch produced depends on the cover quality, soil fertility and length of the *B. decumbens* growth period (in relation to the establishment period and fallow length). The high quantity of roots produced has a favourable effect on the soil porosity. However, when the root system is in place, it increases soil cohesion, which is problematic for planting micropropagated plantlets. Chemical control of the grass cover prior to planting can lead to partial decomposition of the *B. decumbens* roots. Two strategies can then be used to plant micropropagated plantlets in *B. decumbens* mulch.

- A rototiller or a subsoiler tine may be used to till the soil in the small interrow (but this may upset the mulch smothering effect on weeds). The planting line may also be tilled, but only four blades should be used on the rototiller.

Note: the efficacy of Fusilade® (specific grasskiller) in controlling *B. decumbens* has been proven in directed sprays of grass clumps of up to 30 cm height.
A power auger or hand auger can be used to cut through the *B. decumbens* mulch and bore a hole the size of the micropropagated plantlet block. The plantlets can then be readily planted along the planting lines.

**Note:** It is strongly advised to start fertilizing once the micropropagated plantlets have been planted. The fertilization conditions are the same as those recommended for standard planting on bare soil after spontaneous fallows.

*B. decumbens* is not suitable for a live cover crop association because, when alive, it heavily competes with the banana crop thus substantially reducing crop growth, with delayed banana flowering, even with supplementary fertilization. Moreover, this grass does not tolerate shade, so after a first cycle the *B. decumbens* cover develops gaps and becomes highly degraded and eventually completely disappears. Although there could be some regrowth, this is not problematic in the long term.

### 6. INFORMATION AND SUPPLIES

- Contact IT² or banana producers’ groups (BANAMART, BANALLIANCE and LPG) for all inquiries and technical information.
- Contact seed dealers in Martinique and Guadeloupe for seed supplies. Seeds are generally packed in 25 kg bags. They may be sown immediately or stored at 20–25°C in a dry area.

### 7. PLANTING SCHEDULE

Two scenarios are possible for planting *B. decumbens* fallows. Calendars for 12-month and 18-month fallows are illustrated below.

### References:

Hole planting of micropropagated banana plantlets in mulch

Chemical control of the B. decumbens cover with glyphosate (6-8 l/ha)

Last scything of the cover

Mowing B. decumbens at 10-15 cm height promotes optimal coverage without gaps

Directed sprays with Fusilade® (2 l/ha) grasskiller, if necessary

Hole planting of micropropagated banana plantlets in mulch

Chemical control of old banana trees (glyphosate injection) and weed control

Burying of banana residue and plant debris

Preparation of a seed bed if necessary

Row seeding (8 kg/ha) using a mechanical seeder or by broadcast sowing + rolling

Emergence checked

INTEGRATION IN CROPPING SYSTEMS AND SCHEDULES

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ACRIGINAL BENEFITS

- Nonhost of the main banana parasites
- Soil fertility remobilizing and soil restructuring ability
- Rapid and effective soil cover/anti-erosion function
- Excellent fodder
- Integration in cropping systems and schedules
INFORMATION AND SUPPLIES

- Contact IT2 or banana producers’ groups in Martinique (BANAMART and BANALLIANCE) and Guadeloupe (LPG).
- Contact specialized seed dealers for seed supplies.