Weeds of rainfed cropfields in northeastern Benin

Very little is known about some major weeds, while other species such as *Striga* spp., *Chromolaena odorata* and *Imperata cylindrica* have been extensively studied worldwide. Control of weed problems can be an important means to increase agricultural production. This applies particularly to cotton cropping in Benin where, as in other African countries, cotton yields are presently stationary, and agricultural production increases only through expansion of cropland.

Ageratum conyzoides.
Photo T. Le bourgeois

Tridax procumbens.
Photo T. Le Bourgeois

A survey of weed flora amongst cotton, sorghum and yam crops was thus carried out in different agricultural sectors of Borgou in northeastern Benin.

An accurate regional inventory

This inventory was conducted in Borgou department. At a total of 181 counting points in 53 cotton, sorghum and yam plots (Tables 1 and 2), 24 botanical families of weeds were noted, with 53 fully-identified species, and about 10 species that were identified to the genus level. Of these, 25% were Poaceae, 11.6% Asteraceae and 6.7% Fabaceae, Commelinaceae or Euphorbiaceae.

Although few species per family were inventoried, the relative importance of these fami-

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lies was in agreement with the results of previous studies in tropical regions (MERLIER, 1972; VECCHIO *et al.*, 1984; TRAORE & MAILLET, 1992; LE BOURGEOIS, 1993).

The plot results show that the number of species identified per plot ranged from 3 to 19, with an overall mean of 10.9 ± 3.5 (Figure 1). In the different sectors, the mean numbers of species were 8.8 ± 2.7 for Tchaorou, 12.9 ± 2.9 for Bimbéréké and 10.9 ± 3.0 for Kandi. These means are not significantly different.

Although the present results did not differ markedly from those obtained in Benin by GABOREL (1985) or by other authors in studies elsewhere in the tropics, the mean numbers of species per plot were lower, mainly for the following reasons:

– very few surveys were conducted, and they were generally done over a short period at the start of the crop cycle when some species had probably not yet emerged. This was the case for *Ageratum conyzoides* in the Sudano-Sahelian zone of Kandi. This also explains the absence of *Striga* in this inventory;

– for instance, *Cassia* spp. and *Sida* spp. were pooled into a single species category for the incidence and abundance calculations. There were some identification problems at the seedling stage.

Table 1. Number of plots surveyed per sector and crop.

Agricultural sector of Borgou	Crops surveyed			TOTAL
	Cotton	Sorghum	Yam	
Kandi	10	6	4	20
Bimbéréké	8	3	6	17
Tchaourou	6	4	6	16
TOTAL	24	13	16	53

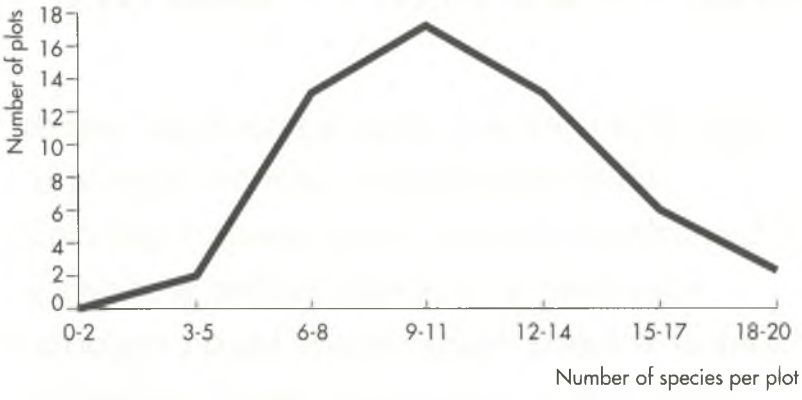

Figure 1. Weed species richness in crop plots.

It should be noted that *Daniellia oliveri*, which is generally abundant in southern Borgou, was not inventoried in this region. In contrast, the surveys were correct for the two other regions, as it is more common in central Borgou than in the north.

The survey

Flora inventory

Agricultural advisors assisted in choosing the survey plots (crop distribution and diversification). Plants were identified and counted within 1 m^2 sampling areas.

Two to four counts were done per station, depending on the homogeneity of the plot. The plot was checked at the end of each count to ensure that no species had been missed. The mean plot size in Borgou was 0.2 ha.

This survey involved a single campaign. It was conducted at the start of the crop cycle for cotton and sorghum (3-6 weeks after sowing), and at the end of the vegetative cycle for yam. It was impossible to do more than one count due to a lack of time.

Data analysis

The relative frequency of a species was represented by the percentage of plots in which the species was present.

In this study, the mean species abundance was calculated as follows: for a species, the total number of plants/m^2 is the sum of count means for the plot (n), X = X1 + X2 + X3 + ... + Xn, (Xn = mean of counts for plot n).

The mean abundance of a species is the ratio of X to the total number of plots where the species was present. In all discussions in this paper on the status of weed species, abundance (calculated in the above manner) is always associated with the incidence.

Frequency of major weed species and their regional distributions

The different species groups are represented by their frequency of appearance (Table 3). Only species with an incidence of at least 25% are mentioned in the results. Thirteen dominant species were thus counted in southern Borgou (Tchaourou sector), 19 species in central Borgou (Bimbéréké sector) and species in northern Borgou (Kandi sector).

Digitaria horizontalis and *Commelina benghalensis* were found throughout the department. To a lesser extent, the following species can be included in this category: *Spermacoce stachydea*, which was more common in the north and *Leucas martinicensis*, more common in the south.

Table 2. List of weeds inventoried in the survey.

Family	Genus and Species
Monocotyledons	
Araceae	*Stylochiton lancifolius* Kotschy & Peyr.
Commelinaceae	*Aneilema beniniensis* (P. Beauv.) Kunth. *Commelina benghalensis* L. *Commelina bracteosa* Hassk. *Commelina* sp.
Cyperaceae	*Cyperus* spp. *Mariscus alternifolius* Vahl.
Poaceae	*Acroceras zizanioides* (Kunth) Dandy *Andropogon gayanus* Kunth var. *bisquamulatus* (Hochst.) Hack *Brachiaria deflexa* (Schum.) C.E.Hubb. ex Robyns *Brachiaria jubata* (Fig. & De Not.) Stapf *Brachiaria lata* (Schum.) C.E.Hubb. *Dactyloctenium aegyptium* (L.) P. Beauv. *Digitaria horizontalis* Willd. *Digitaria* sp. *Eleusine indica* (L.) Gaertn. *Imperata cylindrica* (L.) P. Beauv. *Paspalum scrobiculatum* L. *Pennisetum pedicellatum* Trin. *Pennisetum polystachion* (L.) Schult. *Rottboellia cochinchinensis* (Lour.) W.Clayton *Setaria pallide-fusca* (Schum.) Stapf & C.E. Hubb.
Dicotyledons	
Aizoaceae	*Mollugo nudicaulis* Lam.
Amaranthaceae	*Amaranthus* spp. *Celosia trigyna* L.
Annonaceae	*Annona senegalensis* Pers.
Asteraceae	*Acanthospermum hispidum* DC. *Ageratum conyzoides* L. *Aspilia bussei* O.Hoffm. & Muschl. *Bidens pilosa* L. *Blumea aurita* (L.f) DC. *Tridax procumbens* L. *Vernonia cinerea* (L.) Juss.
Caesalpinaceae	*Cassia* spp. *Daniellia oliveri* (Rolf.) Hutch & Dalz.
Capparidaceae	*Cleome viscosa* L.
Convolvulaceae	*Ipomoea eriocarpa* R.Br.
Euphorbiaceae	*Euphorbia heterophylla* L. *Euphorbia hirta* L. *Phyllanthus amarus* Schum.& Thonn. *Securinega virosa* (Roxb. ex Willd.) Baill.
Fabaceae	*Indigofera secundiflora* Poir. *Sesbania pachycarpa* DC. *Tephrosia* spp. *Zornia glochidiata* Reichb. ex D.C.
Lamiaceae	*Leucas martinicensis* (Jacq.) R.Br.
Loganiaceae	*Spigelia anthelmia* L.
Malvaceae	*Hibiscus asper* Hook.f. *Sida* spp.
Nyctaginaceae	*Boerhavia coccinea* Mill. *Boerhavia diffusa* L. *Boerhavia erecta* L.
Pedaliaceae	*Sesamum radiatum* Schum & Thonn.
Rubiaceae	*Mitracarpus villosus* (Sw.) DC. *Spermacoce stachydea* DC.
Scrofulariaceae	*Striga hermonthica* (Del.) Benth.
Solanaceae	*Physalis angulata* L.
Sterculiaceae	*Waltheria indica* L.
Tiliaceae	*Corchorus tridens* L.

Dactyloctenium aegyptium.
Photo CIRAD-AMATROP

In the Sudano-Sahelian region of Kandi, *Dactyloctenium aegyptium* and *Rottboellia cochinchinensis* were found. In the central region, *Brachiaria lata* was inventoried.

Pennisetum pedicellatum and *A. conyzoides* were found in the Sudano-Guinean zone of southern Borgou. *Tridax procumbens* was common in the central and southern sectors of Borgou, as was *Pennisetum polystachion* in the central and northern sectors. Given the low number of counts in each of these regions, species' behaviour could only be analysed for those with a high frequency in at least one region.

The decreasing incidence of *D. aegyptium* over a north-to-south gradient (85% in the north, 17.6% centre and 6.2% south) and of *Ipomoea eriocarpa* (75% in the north, 58.8% centre and 25% south) confirms that these weeds are well adapted to a Sahelian climate, as also shown in other studies (LE BOURGEOIS, 1993). *Commelina bracteosa*, with a fairly moderate frequency (30%), was only found in Sudano-Sahelian zones.

Abundance of weed species per plot

C. benghalensis infestations were the most stable throughout the department (14 plants/m^2).

For the dominant species, the abundance figures appeared high (7 and 19 plants/m^2) in the Sudano-Guinean sector of Tchaourou. The situation was completely different around Kandi and Bimbéréké, in the northern and central regions, where the mean abundance was barely more than 5 plants/m^2.

Table 3. Weed flora (incidence and abundance) of cotton, sorghum and yam cropfields in the different regions of Borgou (for weeds with an incidence of more than 25%).

Species	Southern Borgou		Central Borgou		Northern Borgou	
	incidence %	abundance plants/m²	incidence %	abundance plants/m²	incidence %	abundance plants/m²
Digitaria horizontalis	94.0	11.5	70.6	3.5	95	4.2
Tridax procumbens	75.0	18.7	76.5	3.7	-	-
Leucas martinicensis	62.5	19.1	58.8	4.2	40	1.4
Ageratum conyzoides	62.5	16.8	-	-	-	-
Pennisetum pedicellatum	56.2	7.4	-	-	-	-
Commelina benghalensis	50.0	14.3	70.6	14.6	70	14.9
Phyllanthus amarus	43.7	1.1	41.2	1.1	-	-
Boerhavia diffusa	37.5	7.5	-	-	25	2.9
Vernonia cinerea	37.5	4.3	-	-	-	-
Spermacoce stachydea	31.2	1.4	76.5	2.4	60	2.4
Imperata cylindrica	25.0	7.8	-	-	-	-
Celosia trigyna	25.0	7.2	-	-	-	-
Ipomoea eriocarpa	25.0	5.3	58.8	4.4	75	5.8
Rottboellia cochinchinensis	-	-	64.7	3	-	-
Pennisetum polystachion	-	-	58.8	1.6	40	0.4
Brachiaria lata	-	-	58.8	0.9	35	1
Commelina sp.	-	-	47.0	1.7	-	-
Aspilia bussei	-	-	47.0	1.1	-	-
Cyperus spp.	-	-	47.0	1.1	35	3.3
Stylochiton lancifolius	-	-	47.0	1.1	30	1.6
Corchorus tridens	-	-	35.3	3.0	75	1.0
Amaranthus spp.	-	-	35.3	1.8	35	4.5
Mitracarpus villosus	-	-	29.4	3.2	45	2.0
Mollugo nudicaulis	-	-	29.4	1.1	-	-
Daniellia oliveri	-	-	29.4	0.7	-	-
Dactyloctenium aegyptium	-	-	-	-	85	4.0
Setaria pallide-fusca	-	-	-	-	45	5.3
Sida spp.	-	-	-	-	45	0.6
Commelina bracteosa	-	-	-	-	30	2.0

The correlation between the frequency and abundance data highlighted that the most common species also caused the most serious infestations. The coefficients of correlation (Table 4) all indicated a significant relation. Weed incidence and abundance showed the same trends. In very different climatic situations, similar patterns were noted by TRAORE & MAILLET (1992) in a Sahelian-type tropical climate, and by MAILLET (1992) in temperate French wine-growing regions. However, LE BOURGEOIS (1993) found no correlation in northern Cameroon, and explained this by the presence of heterogeneous ecological conditions.

Table 4. Coefficients of correlation for the incidence and abundance of weeds encountered in the three sectors of Borgou.

Sector surveyed	Coefficient of correlation	Probability
Tchaourou	0.61	95%
Bimbéréké	0.44	99%
Kandi	0.44	95%

Major weeds relative to the rotational position of crops

Ten species of agronomic importance (frequency of 25% or higher) were common to cotton, sorghum and yam cropfields. In the cotton and sorghum plots, 16 common species were found. Overall, 22 species were encountered in cotton plots: 6 Graminae, 1 Cyperaceae and 15 broad-leaved 17 species.

The most important species were:

– *D. horizontalis,* with an incidence of around 70% in yam plots and 92% in sorghum and cotton plots. Its abundance ranged from 5 to 7 plants/m²;

– *C. benghalensis,* very common in cotton (75%) and sorghum (84%) plots, but less common in yam (31%);

– *I. eriocarpa,* very common in cotton and sorghum plots (75% and 69% respectively), but absent from yam plots.

Borgou region in Benin

Borgou department covers a 51 000 km² area, just under half of the overall size of Benin. The natural environment is characterised by plateaux of tropical ferruginous soils on loose bedrock, and a Sudanese climate, generally with one rainy season from May to September. Mean annual rainfall ranges from 900 to 1 100 mm. Mean daily temperatures are always high, between 26°C and 28°C. Northeastern Benin has a Sudanese-type tropical climate, with the outer regions subjected to other influences, i.e. Sahelian in northern Borgou and humid Guinean-type in the south (Figure 2). The survey was carried out in these three climatic sectors, at Tchaourou, Bimbéréké and Kandi.

Diversified agricultural production

The vegetation of the region is made up of typical savanna species: *Parkia biglobosa, Adansonia digitata, Vittelaria paradoxa, Andropogon gayanus* and *Pennisetum* spp. Cotton, sorghum and yam are the main crops grown in the Borgou region. In 1992, sorghum was cropped on the largest area (80 000 ha), followed by cotton (75 000 ha) and yam (43 000 ha) (DAPS-MDR, 1993). The situation has now changed in favour of cotton. According to a recent study of COLNARD (1995), farmers of Sikki-Gourou village in western Borgou cultivate 5 ha of land on average, with 49.4% cotton, 14.9% sorghum (3rd ranking crop) and 13.4% yam (4th). At Sakabansi, in eastern Borgou, farmers cultivate 3.4 ha on average, with 26.6% cotton (2nd ranking crop), 16.9% sorghum (3rd) and 15.3% yam (4th).

Cropping calendar

Yam, the starter crop after clearance of long fallows (8 years or more), is planted from January to March. Harvesting begins in August for early varieties, and December for late varieties. Cotton is introduced into the rotation in the 3rd or 4th year. It is sometimes planted as a starter crop after clearance of short fallows (3 years). Cotton is sown in June and harvested in October-November. Cotton can be grown 4 years (or more) in succession with the addition of inorganic fertilizers. Sorghum is sown in late May-early June and harvested in November-December.

Figure 2. Borgou department and the rainfall gradient.

For weed species of low frequency, the differences in inventoried flora were perhaps a result of the small sample size. Three weeds, *Brachiaria jubata, Digitaria* sp. and *D. oliveri* were encountered exclusively in yam fields. Yam is sometimes cultivated in lowlands or on cleared land with some bushes and trees, thus explaining the presence of weeds such as *B. jubata* which grows well in wet environments. *D. oliveri, Vittelaria paradoxa, Annona senegalensis* and *Securinega virosa* are all woody species. Shoots of these plants appear on recently-cleared plots. It was therefore not surprising to encounter these species in fields of yam, the starter crop after long fallows.

Differences in weed flora found amongst yam, cotton and sorghum crops could more be explained by the position of each crop in the rotation rather than by differences in cropping procedures.

The abundance results obtained for each species did not generally differ between crops. *C. benghalensis* was an exception, since 16 plants/m² were counted in cotton and sorghum crop fields, while there were only 4 plants/m² in yam crops. This was because *C. benghalensis* was not as developed in newly-cleared plots.

The weed flora similarities noted in cotton and sorghum cropfields could be explained by the fact that sorghum benefits from the fertilizer applied to the cotton crop, and by the position of these two crops in the rotation (from the 3rd or 4th year). It is generally considered that older cropfields have higher weed infestation. In addition, cotton and sorghum are sown at almost the same time of the year. Moreover, with inorganic fertilizer input, cotton crops can be grown in the same field through several consecutive years.

Analysis of these results revealed that *D. horizontalis,* closely followed by *C. benghalensis,* are the most common weeds in the department, and *C. benghalensis* is the most abundant.

Although *Digitaria* is the most common and is relatively abundant, farmers do not consider it to be a problem weed. They find that *Digitaria* is easily controlled by hoeing and, rightly or wrongly, consider it to be less of a nuisance.

Conclusion

Climatic variations within the regions of Borgou partially explain the weed flora differences revealed in this survey. Some species are better adapted to the Sahelian climate, others to the humid Sudanese climate. For instance, *D. aegyptium* and *C. bracteosa* were commonly encountered in the Sudano-Sahelian zone of the north, while *A. conyzoides* and *P. pedicellatum* were mainly found in the humid Sudanese zone of the south. The weed flora was less rich in the Sudano-Guinean region, but the mean species abundance levels were highest there.

In general, the number of species inventoried per plot was low. Apart from the methodological considerations already discussed (short survey period, difficulties in identifying species at the seedling stage), some common species on fallow land, such as *A. gayanus,* were extremely rare in the cultivated plots. In terms of frequency and abundance, *C. benghalensis* was the main species of agronomic importance in the dry northern climatic region, thus confirming the drought resistance capacity of this species, as stated by HOLM *et al.* (1977).

Weed infestation in a cornfield: mainly *Commelina benghalensis.*
Photo A. Ahanchede

In this study, the soil type probably had little influence, and the location of the plots in the toposequence was not a determining factor, except in certain cases for yam.

The length of time the plot had been cultivated was, on the other hand, a crucial factor, as clearly shown by the specificity of the weed flora in yam cropfields. The age of the plot seemed to be the main agronomic factor responsible for weed infestation in cropfields. The most infested fields had been cultivated for several years in succession, and weed control is more difficult when the same crop is grown year after year.

High *Commelina benghalensis* infestation in a cotton field.
Photo A. Ahanchede

Bibliography

ADAM K.S. et BOKO M., 1983. Le Bénin. EDICEF, Paris, France, 98 p.

AYENSU E.S., DOGGETT H., KEYNES R.D., MARTON-LEFEVRE J., MUSSELMAN L.J., PARKER C., PICKERING A., 1984. Proceedings on the worskhop on biology and control of striga, 14-17 November 1993, Dakar, Senegal. IDRC-ICSU Press, Ottawa, Canada, 216 p.

COLNARD C., 1995. Pratiques paysannes et utilisation des intrants en culture cotonnière au Bénin. Engeneering thesis, ENSH, Versailles, France, 122 p.

DAPS-MDR, 1993. Compendium des statistiques agricoles et alimentaires. Publication de la direction de l'analyse, de la prévision et de la synthèse. Ministère du développement rural, Cotonou, Benin, 158 p.

GABOREL C., 1985. La protection contre les adventices dans le cadre d'un système de culture au Bénin. Coton et Fibres Tropicales 40 (1) : 7-12.

HOLM L., PLUCKNETT D.L., PANCHO J.V., HERBERGER J. P., 1977. The world's worst weeds — distribution and biology. East-west Center, University Press of Hawaii, Honolulu, Hawaii, 609 p.

LE BOURGEOIS T., 1993. Les mauvaises herbes dans la rotation cotonnière au Nord-Cameroun (Afrique). PhD thesis, USTL, Montpellier II, France, 249 p.

MAILLET J., 1992. Constitution et dynamique des communautés de mauvaises herbes des vignes de France et des rizières de Camargue. PhD thesis, USTL, Montpellier, France, 179 p.

MERLIER H., 1972. Etudes phytosociologiques menées au Centre national de recherche agronomique de Bambey (Sénégal), synthèse. L'Agronomie Tropicale 27 : 1 253-1 265.

Direction de la recherche coton et fibres, 1993. Rapport préliminaire 1992/1993 de la recherche cotonnière, Cotonou, Benin, 27 p.

Direction de la recherche coton et fibres, 1994. Rapport de synthèse campagne 1993/1994. DRCF, Cotonou, Benin, 26 p.

TRAORE H., MAILLET J., 1992. Flore adventice des cultures céréalières annuelles du Burkina Faso. Weed Research 32 (4) : 279-293.

VECCHIO V., RAIMONDO F.M., SHIRWA A.H., ROSSITO M., 1984. Les mauvaises herbes du manioc en Somalie. *In* 7e colloque international sur l'écologie, la biologie et la systématique des mauvaises herbes, 9-11 octobre 1984, Paris, France. COLUMA-EWRS, Paris, France, p. 191-200.

WEBER H.C., FORSTREUTER W., 1987. Proceedings of the Fourth International Symposium on Parasitic Flowering Plants. WEBER H. C., FORSTREUTER W. (Eds), Marburg, West Germany, 848 p.

Beginning of infestation of a cotton cropfield by *Commelina benghalensis* and *Brachiaria lata*.
Photo A. Ahanchede

Abstract... Résumé... Resumen

A. AHANCHEDE, J. GASQUEZ — **Weeds of rainfed cropfields in northeastern Benin.**

A survey was conducted at three locations in Bourgou Department (Benin) to determine the agricultural impact of weeds on the main crops, i.e. cotton, sorghum and yam. Plant incidence and cover abundance were assessed. The identified weed species belonged to 24 different plant families, with 25% Poaceae, 11.6% Asteraceae, and 6.7% Fabaceae, Commelinaceae and Euphorbiaceae species. Some of the most common weeds in the Department are: *Digitaria horizontalis*, with about 70% incidence with yam, 92% with sorghum and cotton, at an abundance rate of 5-7 plants/m^2; *Commelina benghalensis* is very common with cotton crops (75%) and sorghum (84%), but less with yam (31%), with a stable abundance rate of 14 plants/m^2; *Ipomoea eriocarpa* has an abundance rate of 4-6 plants/m^2 and is very common with cotton and sorghum (75% and 69%, respectively), but absent in yam fields. This latter species is especially dominant in the Sudano-Sahelian zone. In this study, the length of time the plot has been cropped and the status of the crop in the rotation generally determined the flora identified according to the cotton, yam and sorghum crops.

Keywords: survey, weed, cotton, yam, sorghum, incidence, abundance, Benin.

A. AHANCHEDE, J. GASQUEZ — **Mauvaises herbes des cultures pluviales au nord-est du Bénin.**

Une enquête est menée dans trois localités du département du Borgou au Bénin pour évaluer l'importance agronomique des mauvaises herbes des principales cultures : cotonnier, sorgho et igname. Les paramètres utilisés sont la fréquence et l'abondance. Les espèces identifiées représentent 24 familles botaniques avec les poacées, 25 % des espèces, les astéracées 11,6 % ; les fabacées, les commelinacées et les euphorbiacées, 6,7 %. Parmi les mauvaises herbes les plus fréquentes dans tout le département, on trouve : *Digitaria horizontalis* avec une fréquence d'environ 70 % dans l'igname, 92 % dans le sorgho et le cotonnier, son abondance varie entre 5 et 7 plantes par mètre carré ; *Commelina benghalensis* très fréquente dans les cultures de cotonnier (75 %) et de sorgho (84 %), mais rare dans les cultures d'igname (31 %), avec une abondance stable de 14 plantes par mètre carré ; *Ipomoea eriocarpa* avec une abondance variant entre 4 et 6 plantes par mètre carré est très fréquente dans le cotonnier et le sorgho (75 et 69 % respectivement), mais absente des parcelles d'igname. Cette espèce est surtout dominante dans le domaine soudano-sahélien. Dans cette étude, l'ancienneté de la mise en culture et la place de la culture dans la rotation déterminent en grande partie la flore identifiée dans les cultures de cotonnier, d'igname et de sorgho.

Mots-clés : enquête, mauvaise herbe, cotonnier, igname, sorgho, fréquence, abondance, Bénin.

A. AHANCHEDE, J. GASQUEZ — **Malezas de los cultivos de secano en el Noreste de Benin.**

Se está realizando una encuesta en tres localidades del departamento de Borgou, en Benin, para evaluar la importancia orgánica de las malezas en los principales cultivos: algodón, sorgo y ñame. Los parámetros utilizados son la frecuencia y la abundancia. Las especies identificadas representan 24 familias botánicas, siendo las páceas el 25% de las especies, las asteráceas el 11,6% y las fabáceas, commelináceas y euforbiáceas el 6,7%. Entre las malezas más frecuentes en todo el departamento, se encuentran: *Digitaria horizontalis*, con una frecuencia de un 70% en el ñame, el 92% en el sorgo y el algodón y su abundancia varía entre 5 y 7 plantas por metro cuadrado; *Commelina benghalensis*, muy frecuente en los cultivos de algodón (75%) y de sorgo (84%), pero rara en los cultivos de ñame (31%) con una abundancia estable de 14 plantas por metro cuadrado; *Ipomoea eriocarpa*, con una abundancia que varía entre 4 y 6 plantas por metro cuadrado y muy frecuente en el algodón y el sorgo (75 y 69% respectivamente), pero ausente de las parcelas de ñame. Esta especie es dominante sobre todo en el campo sudano-saheliano. En este estudio, la antigüedad de la puesta en cultivo (y por consiguiente del lugar del cultivo en la rotación) determina en gran parte la flora identificada según los cultivos de algodón, ñame y sorgo.

Palabras clave: encuesta, maleza, algodón, ñame, frecuencia, abundancia, Benin.