

**A-frame levels  
can be used to  
trace contour  
lines for soil  
conservation, or  
irrigation  
ditches at  $\frac{1}{2}$  %  
slope. They are  
highly accurate,  
and cost  
nothing.**





Contour rock walls are effective. However, they require an excessive amount of work to make, as well as some upkeep. Should be seen primarily as a way of ridding fields of rocks.





**On fields of less than about 25%, contour rock walls can form beautiful terraces. Note the lack of stones in the field, the height of the soil where the men are standing, and the quality of the maize.**





Rocks walls  
can be made  
taller as  
erosion makes  
more and more  
rocks appear  
and they need  
to be cleared  
from the fields.  
(Note the  
height of the  
walls, burned  
field in  
background.)





Same field,  
three years  
later. The  
rock walls  
have been  
heightened,  
more rocks  
appear. Base  
of walls needs  
more support.  
Field in  
background is  
being  
improved.





**These contour  
rock walls  
were built  
with food for  
work.**

**Without  
maintenance,  
all soil  
conservation  
practices  
concentrate  
run-off, make  
the erosion  
worse.**





We used contour ditches in Central America for a decade. But eroding soil fills them in repeatedly, causing ongoing labor costs that were too high.

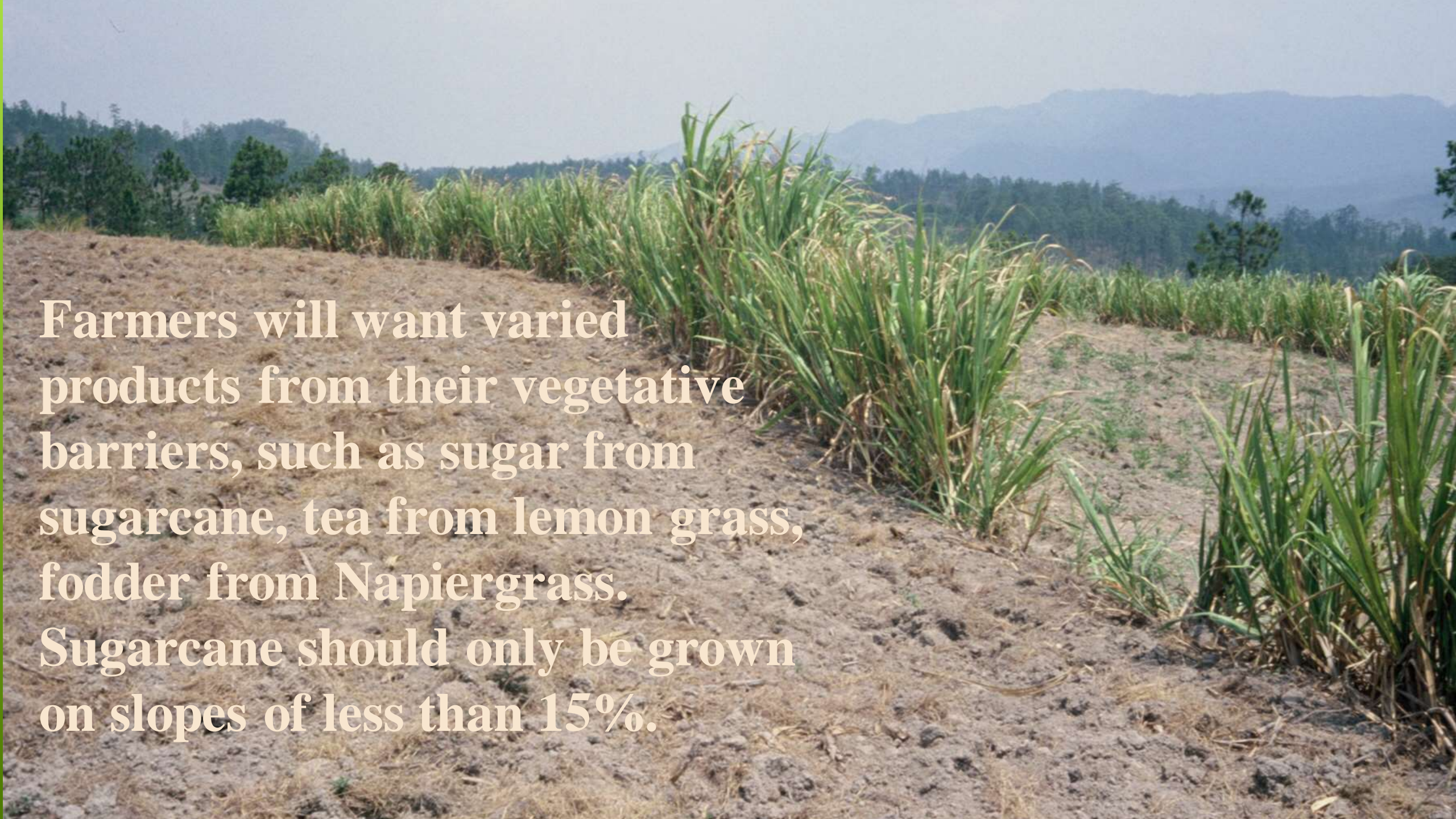




Ditches should always be reinforced with a grass barrier (here the Napiergrass is just getting started). Still, even with a grass barrier above the ditch, the ditch is being filled in with soil.

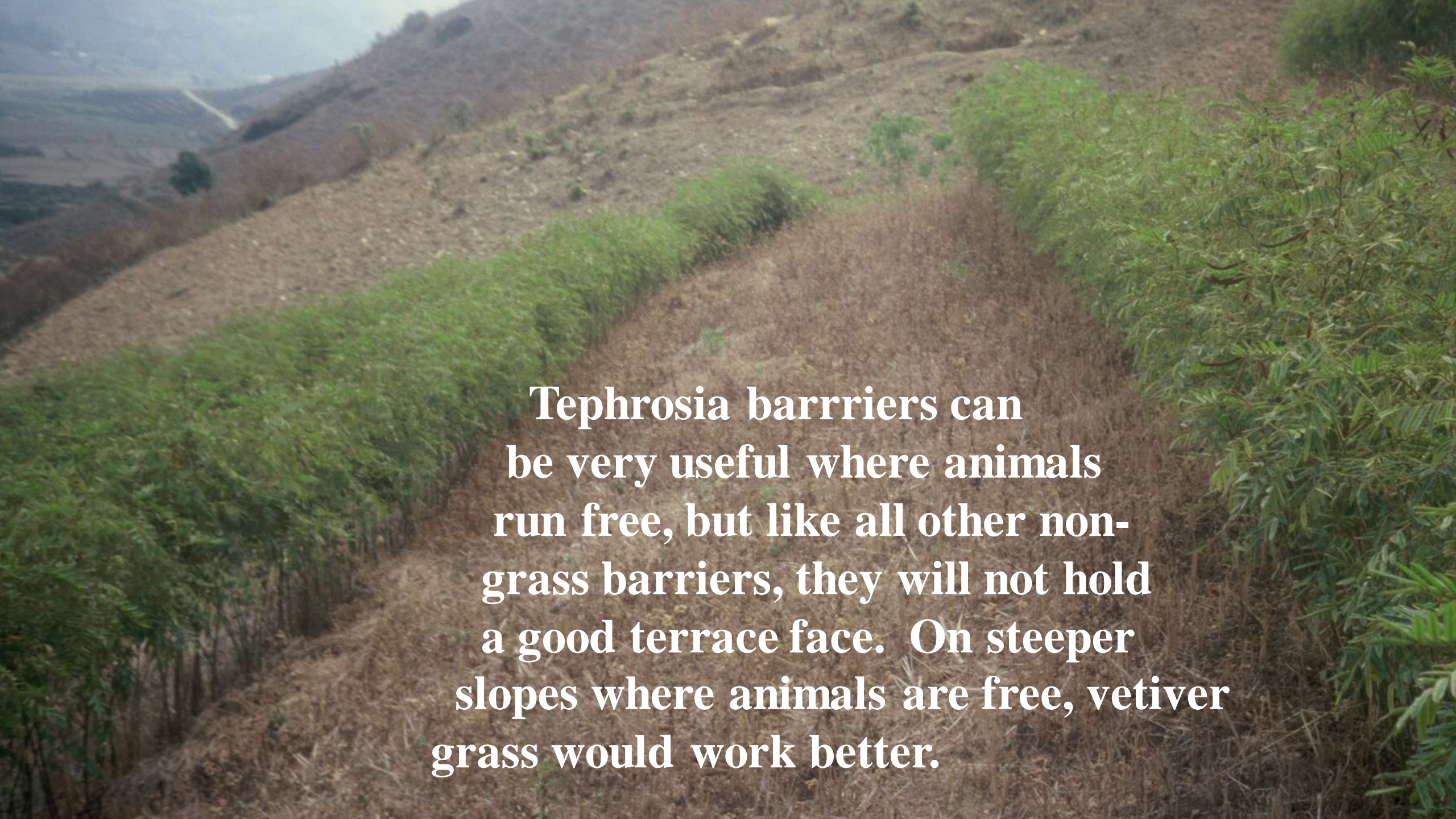






Farmers will want varied products from their vegetative barriers, such as sugar from sugarcane, tea from lemon grass, fodder from Napiergrass. Sugarcane should only be grown on slopes of less than 15%.



The image shows a hillside with rows of green Tephrosia bushes planted as barriers. The ground is brown and appears to be eroded or dry. The text is overlaid on the image, providing information about the effectiveness of these barriers.

**Tephrosia barriers can be very useful where animals run free, but like all other non-grass barriers, they will not hold a good terrace face. On steeper slopes where animals are free, vetiver grass would work better.**



**In four or five years, a good contour grass barrier will make “slow-forming terraces.” There is almost never a need to build bench terraces by hand.**





Napiergrass  
can hold a  
terrace face  
of up to 2 mt  
in height (the  
one pictured  
is about 1.4  
mt high).  
The barrier  
shown is half  
what is  
needed to  
feed one cow  
permanently.





**Fifteen years ago, smallholder farmers in San Martin Jil., Guatemala, had less than 0.3 ha and no cattle. They have less land now, but most families have three or four cows.**





**In-row tillage,  
or strip  
tillage,  
reduces labor,  
increases the  
impact of  
organic  
fertilizers,  
and gets  
rocks out of  
the way  
easily. It is  
better done  
with animals.**





**Rows are  
made  
parallel  
to the  
contour  
lines,  
with  
some  
rows  
ending  
about  
halfway  
between  
the lines.**





The width of the row (generally from 80 cm to 1.5 mt) will vary according to the crops planted and the slope of the field.





As fields become steeper, the strips will automatically, over time, turn into mini-terraces. A small trough near the terrace face is used for walking.





Any crops  
can be  
grown on  
the mini-  
terraces. If  
the biomass  
produced is  
sufficient,  
zero tillage  
can be used.  
(All strip  
tillage can  
be done  
with CA.)





**On steeper slopes, the terrace faces function as water harvesting surfaces, almost doubling the amount of rainwater available to the crops' roots.**





As the slope increases  
(here we see  
a 70% slope),  
technologies  
can be  
combined.  
Maize,  
onions,  
cabbage,  
tomatoes and  
fruit trees are  
captured in  
this photo.





A photograph of a lush, green landscape. In the foreground, there are large, broad-leafed plants, possibly a type of shrub or small tree. The middle ground is filled with dense, low-lying green vegetation. In the background, there are several palm trees and more dense foliage, suggesting a tropical or subtropical environment. The overall scene is vibrant and healthy, illustrating the concept of effective erosion control through dense plant cover.

**Of course, in the end, by far the most effective erosion control is achieved by keeping the soil covered!**





**This soil is from the field in the previous shot. After 40 years of being cultivated with maize (intercropped with mucuna) every year, on a 30% slope, with no soil conservation measures and 2,000 mm/year of rainfall, the soil of this field is more productive than it ever was before. Should we call this negative erosion?**



**This farmer and his son once had to cut sugarcane on a nearby hacienda because they couldn't make this land produce anything. With contour grass barriers and CA with gm/ccs (all pictured), the farmer now harvests all the beans and maize his family needs on half of his land. On the other half, cash crops require enough labor and provide enough income that his son has decided to stay on the farm, instead of going to the city.**

