

Living in the soil



2015 INTERNATIONAL YEAR OF SOILS



Script: M^a. Pilar Jiménez Aleixandre

Illustration: Estudio Tangaraño

Documentation and scientific advice: M. T. Barral Silva and F. Díaz-Fierros V.

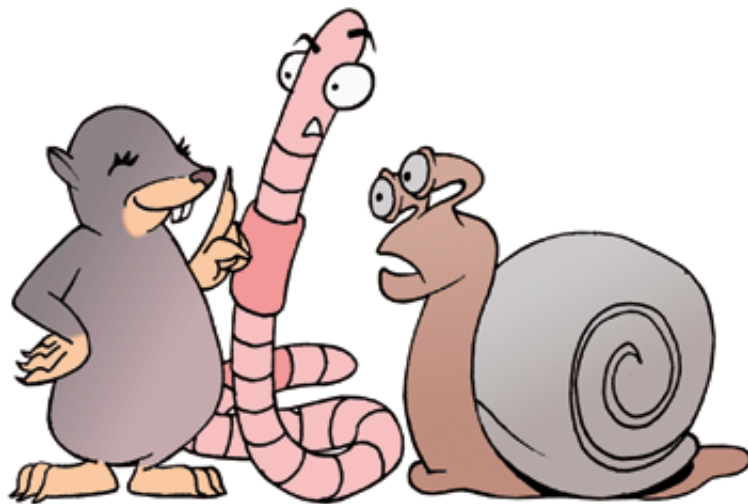
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The Galician Culture Council published, in the Galician language, the comic *Vivir no solo* with the aim of raising awareness amongst young people the importance of soil and the need to protect it.

Recently, it has promoted the adaptation and re-edition of this comic in Spanish for broadcasting nationally. This book is an English translation and adaptation of the Spanish edition of the comic *Vivir en el suelo*.

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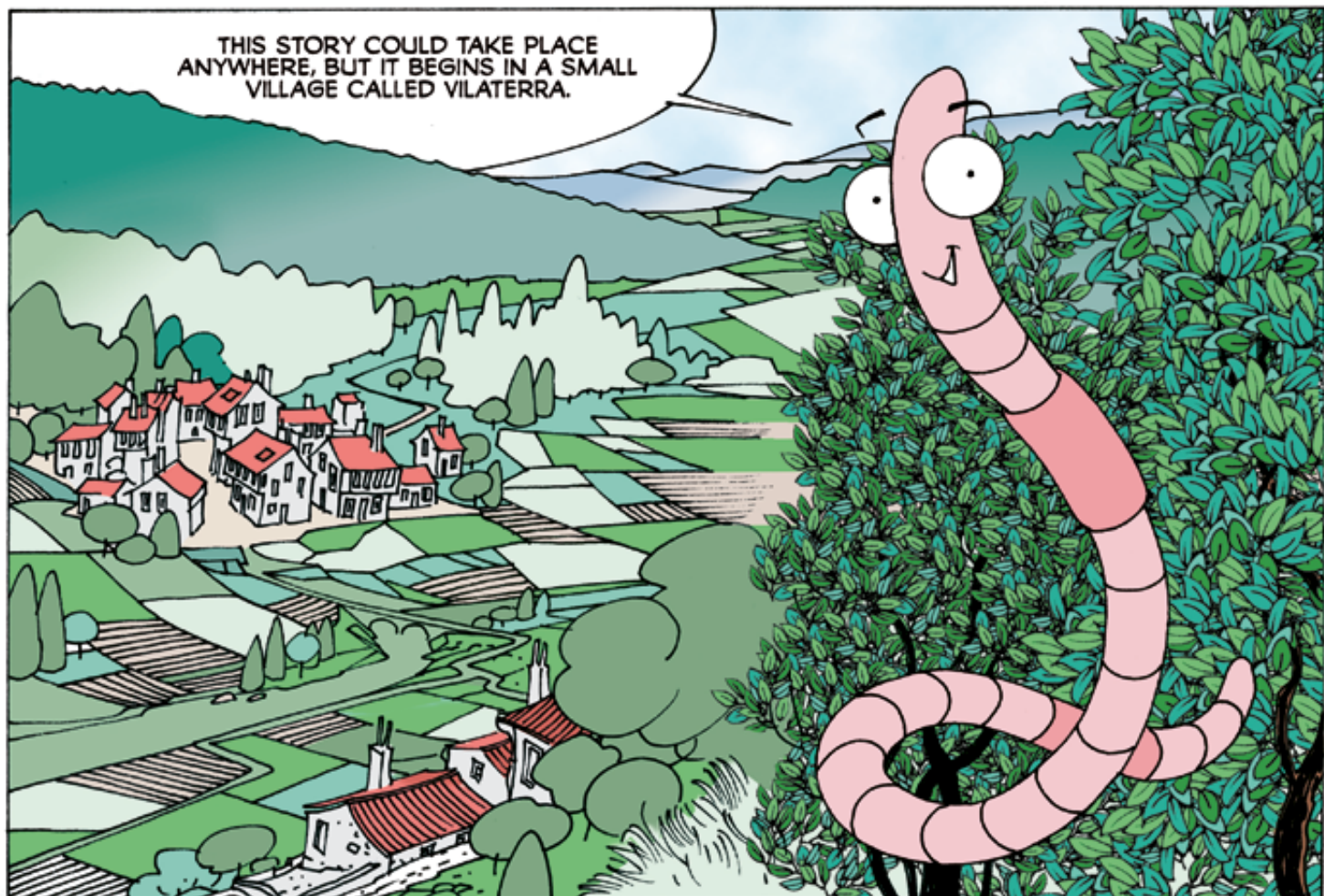
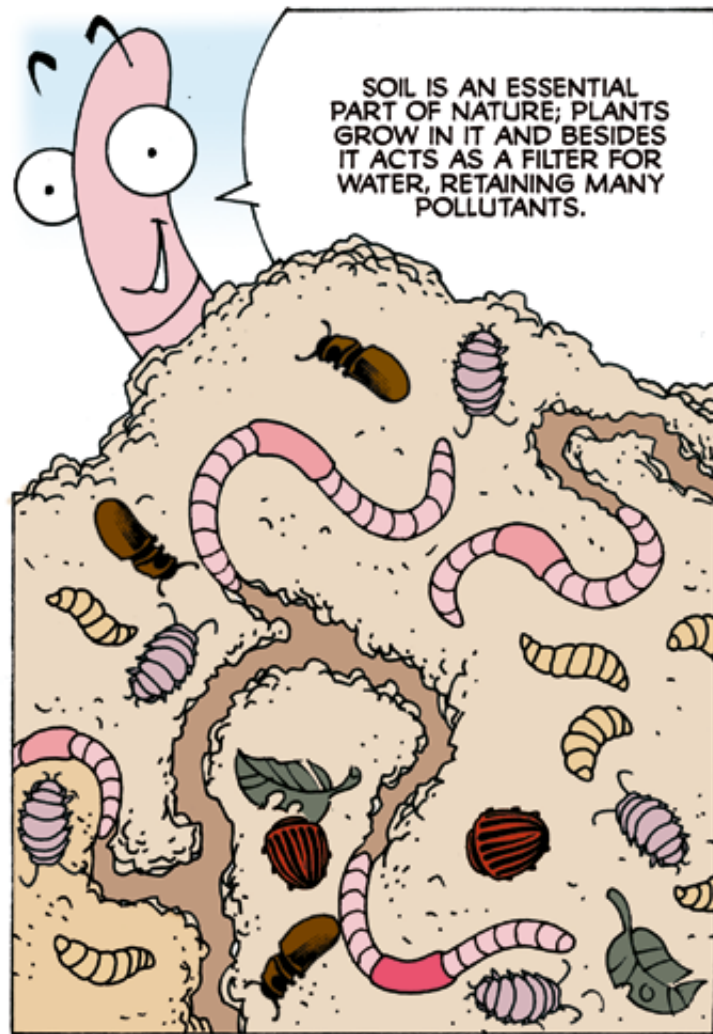
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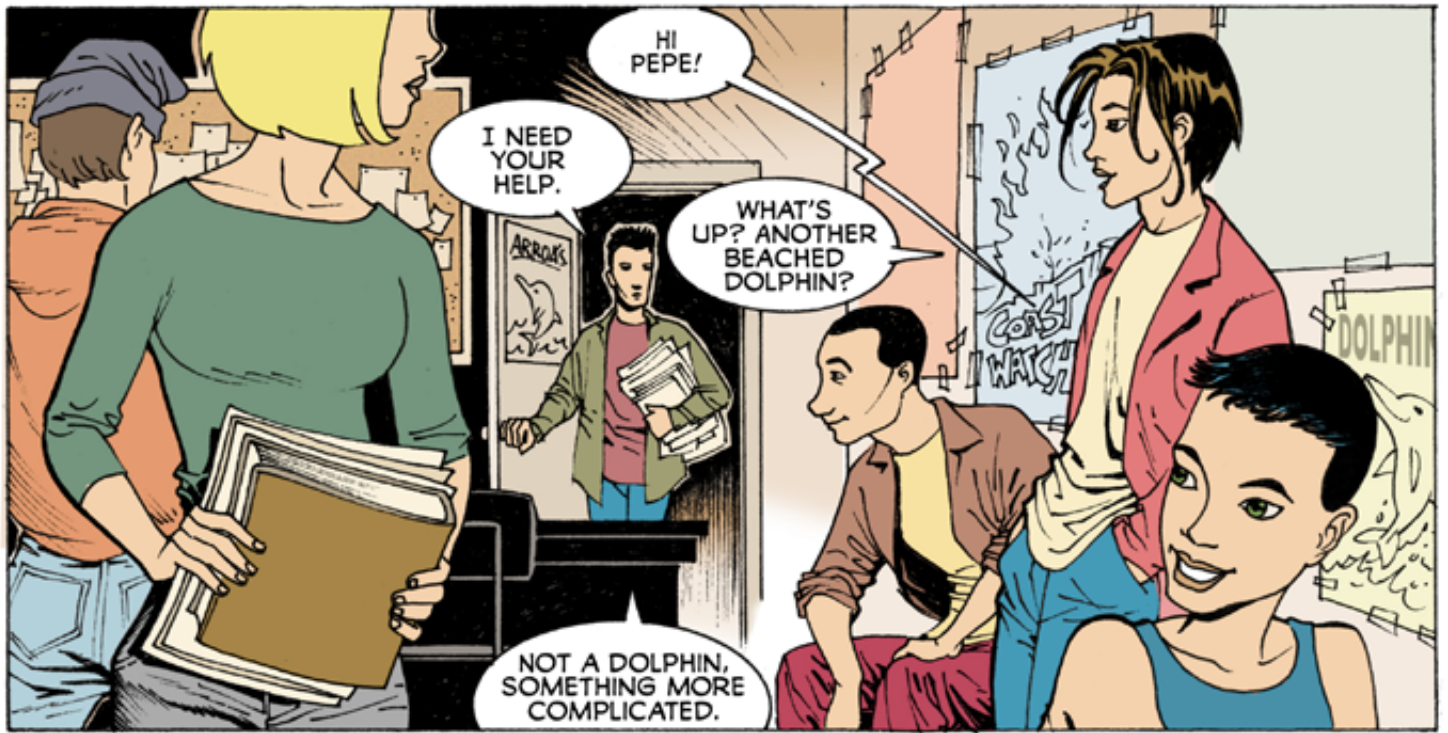
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HI PEPE!

I NEED YOUR HELP.

WHAT'S UP? ANOTHER BEACHED DOLPHIN?

NOT A DOLPHIN, SOMETHING MORE COMPLICATED.



... AND SOME PEOPLE DON'T UNDERSTAND THAT THIS PROBLEM AFFECTS EVERYONE, I'M NOT BEING PARANOID.

IT'S JUST THAT WE DON'T KNOW ANYTHING ABOUT SOIL ...

BESIDES, IT'S NOT A BIRD OR A DOLPHIN THAT WE CAN FEEL SORRY FOR.



IT'S DIFFICULT TO EXPLAIN JUST HOW IMPORTANT SOIL IS...

TO START WITH, WE SHOULD LEARN WHY IT'S IMPORTANT OURSELVES.

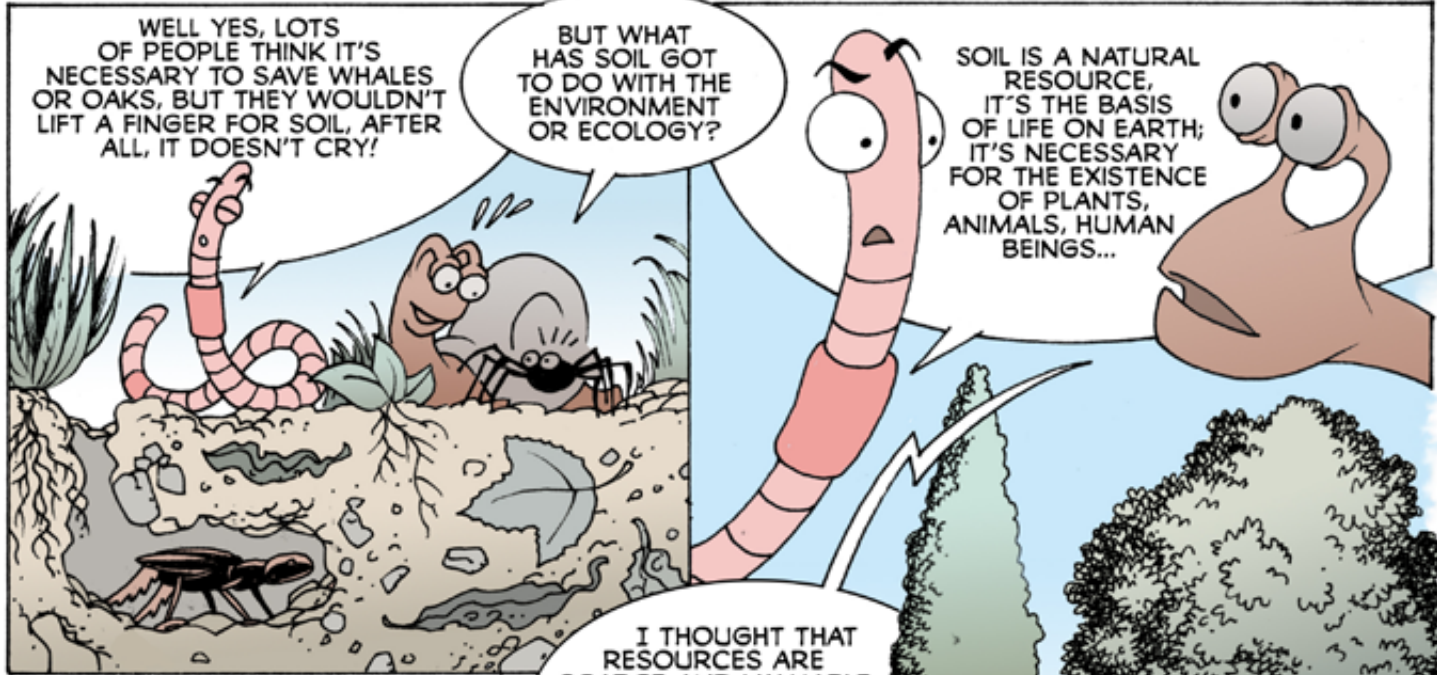
AND WHAT WE CAN DO TO PROTECT IT.



LET'S GET SOME INFORMATION AND THINK ABOUT WHAT WE CAN DO.

THANKS A LOT.

IT'S THE SOIL THAT SHOULD BE THANKING US!



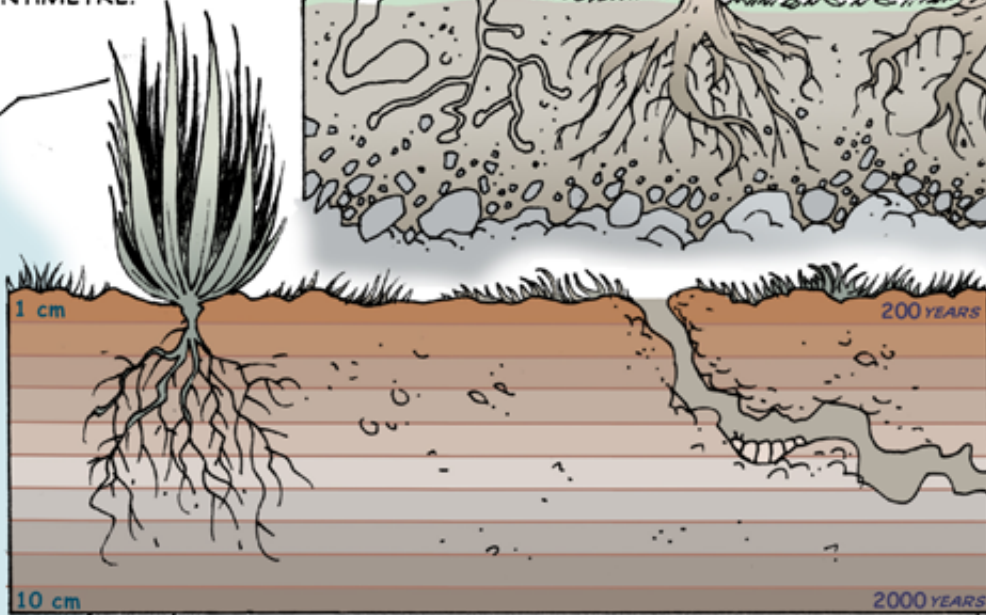
WELL YES, LOTS OF PEOPLE THINK IT'S NECESSARY TO SAVE WHALES OR OAKS, BUT THEY WOULDN'T LIFT A FINGER FOR SOIL, AFTER ALL, IT DOESN'T CRY!

BUT WHAT HAS SOIL GOT TO DO WITH THE ENVIRONMENT OR ECOLOGY?

SOIL IS A NATURAL RESOURCE, IT'S THE BASIS OF LIFE ON EARTH; IT'S NECESSARY FOR THE EXISTENCE OF PLANTS, ANIMALS, HUMAN BEINGS...

OF COURSE IT'S VALUABLE, BECAUSE GOOD SOIL THAT CAN BE USED FOR FARMING IS SCARCE. AND DO YOU KNOW HOW LONG IT TAKES TO FORM SOIL? MORE THAN 200 YEARS PER CENTIMETRE!

I THOUGHT THAT RESOURCES ARE SCARCE AND VALUABLE. BUT THERE'S A LOT OF SOIL, YOU'RE NOT TRYING TO TELL ME THAT IT'S ACTUALLY VALUABLE!



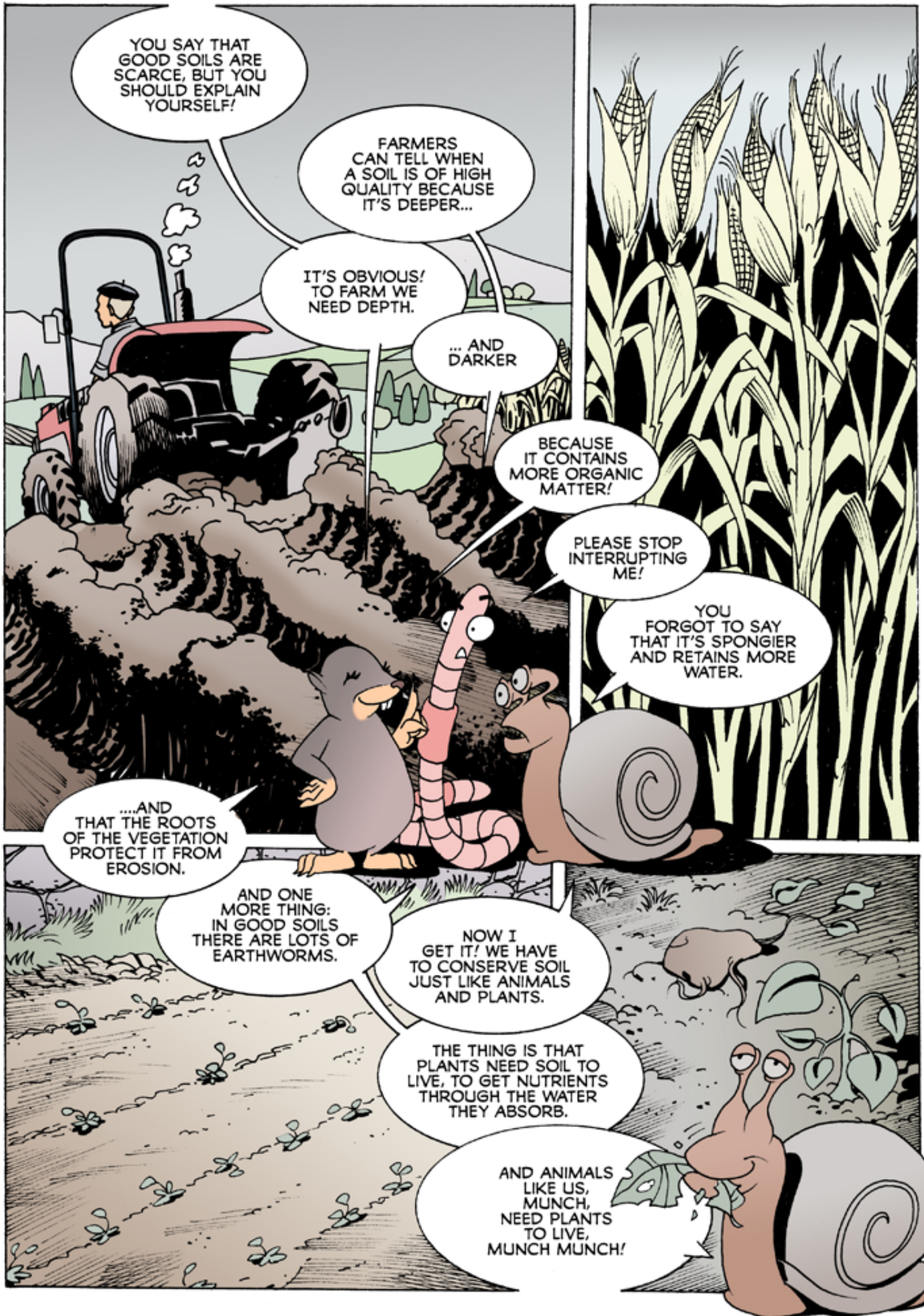
SO LONG?

SOILS ARE FORMED WHEN ROCKS ARE FRAGMENTED AND WEATHERED MAINLY BECAUSE OF THE WATER ACTION. PLANTS START GROWING BETWEEN THE LOOSE PIECES AND WHEN THEY DIE, THEIR REMAINS BECOME HUMUS, WHICH IS DARK AND SPONGY.



AND WHERE DO ANIMALS FIT INTO ALL THIS?

ALL LIVING BEINGS THAT LIVE IN THE SOIL CONTRIBUTE TO ITS FORMATION, BORING, BREAKING, LEAVING BEHIND EXCREMENT... SPECIALLY EARTHWORMS!



YOU SAY THAT GOOD SOILS ARE SCARCE, BUT YOU SHOULD EXPLAIN YOURSELF!

FARMERS CAN TELL WHEN A SOIL IS OF HIGH QUALITY BECAUSE IT'S DEEPER...

IT'S OBVIOUS! TO FARM WE NEED DEPTH.
... AND DARKER

BECAUSE IT CONTAINS MORE ORGANIC MATTER!

PLEASE STOP INTERRUPTING ME!

YOU FORGOT TO SAY THAT IT'S SPONGIER AND RETAINS MORE WATER.

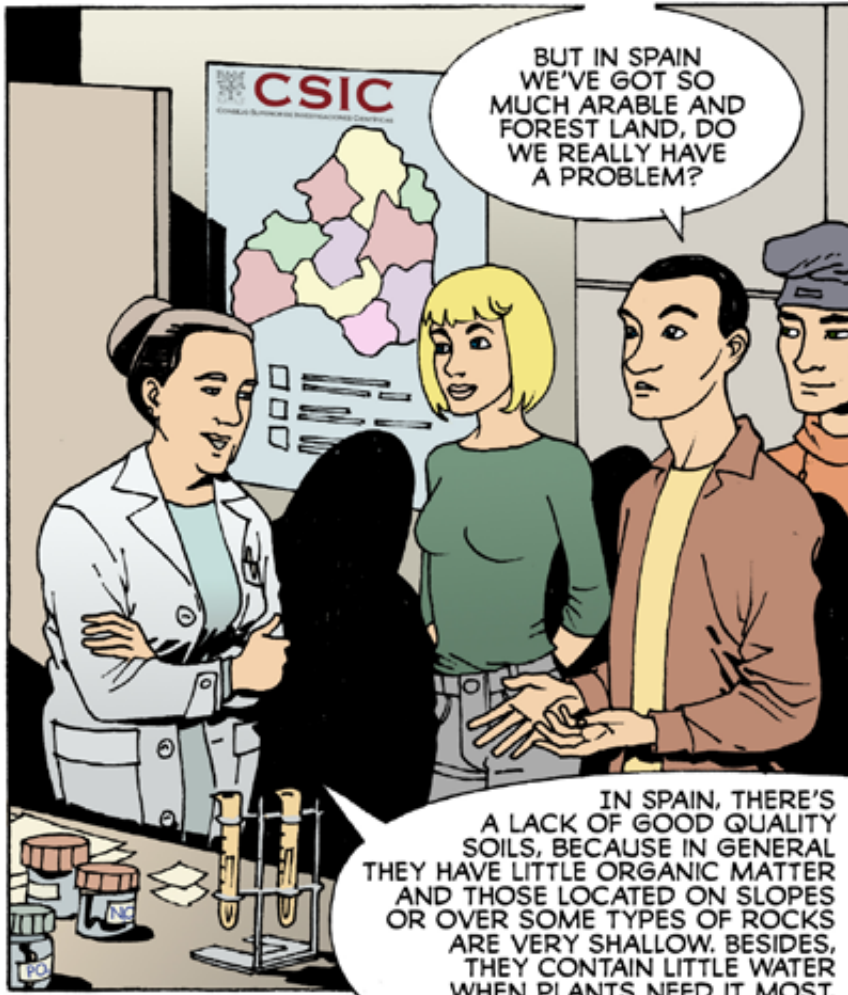
...AND THAT THE ROOTS OF THE VEGETATION PROTECT IT FROM EROSION.

AND ONE MORE THING: IN GOOD SOILS THERE ARE LOTS OF EARTHWORMS.

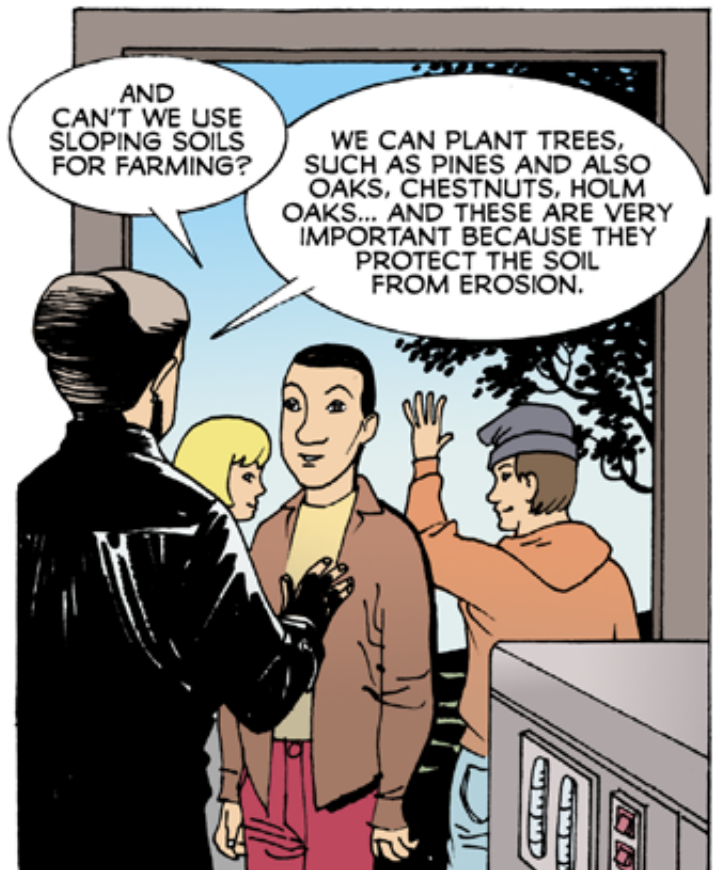
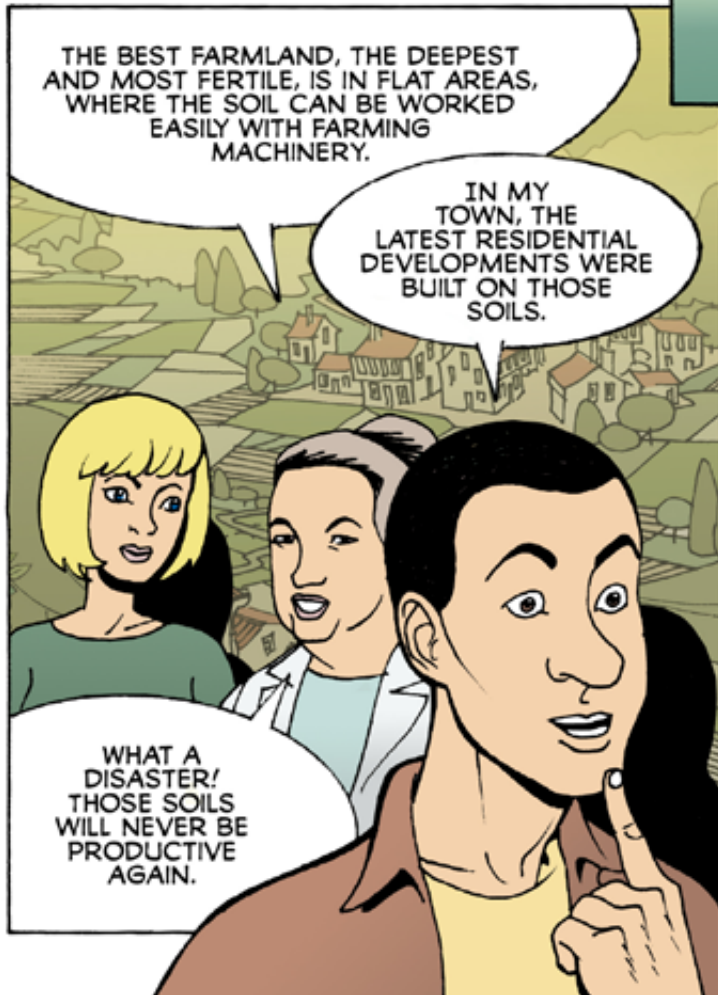
NOW I GET IT! WE HAVE TO CONSERVE SOIL JUST LIKE ANIMALS AND PLANTS.

THE THING IS THAT PLANTS NEED SOIL TO LIVE, TO GET NUTRIENTS THROUGH THE WATER THEY ABSORB.

AND ANIMALS LIKE US, MUNCH, NEED PLANTS TO LIVE, MUNCH MUNCH!



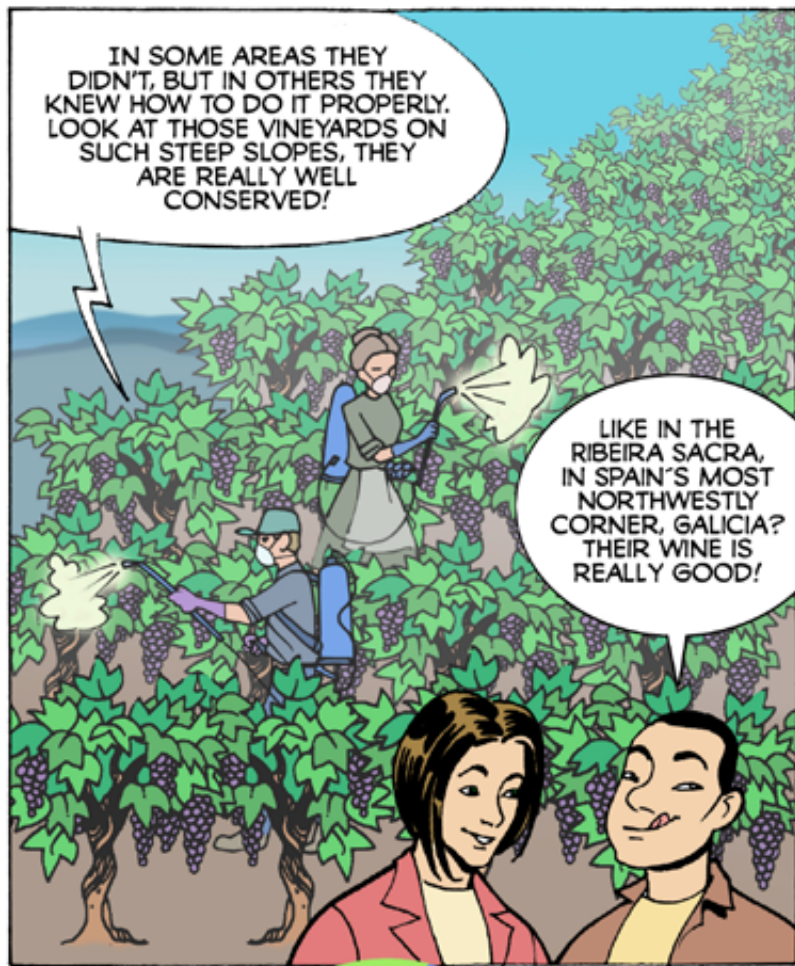
IN THE NORTH AND NORTHWEST OF SPAIN, NORMALLY IT DOES. BUT IN THE REST OF THE COUNTRY, WITH A MEDITERRANEAN CLIMATE, RAINFALL IS SCARCE IN SPRING AND SUMMER. THAT'S WHY THEY NEED IRRIGATION.





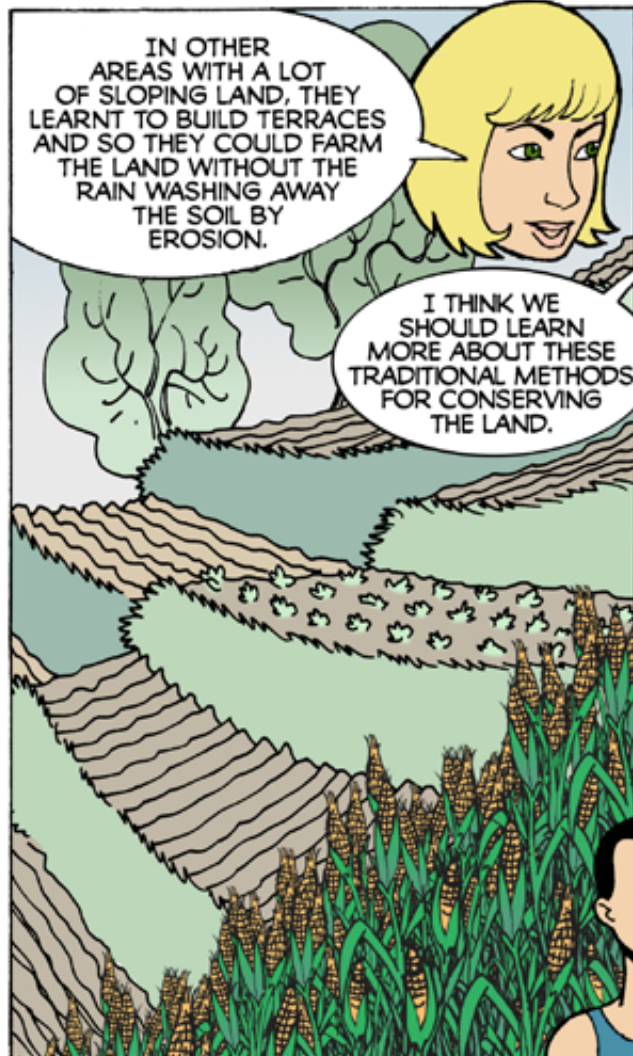
IN THE MEDITERRANEAN, EXCESSIVE GRAZING OVER CENTURIES HAS DESTROYED THE VEGETATION OF MOUNTAINOUS AREAS AND BROUGHT ABOUT A LOT OF EROSION. FOREST FIRES ALSO DESTROY VEGETATION IN THE COUNTRYSIDE.

DIDN'T THE FARMERS ENCOURAGE THE CONSERVATION OF THE SOIL?



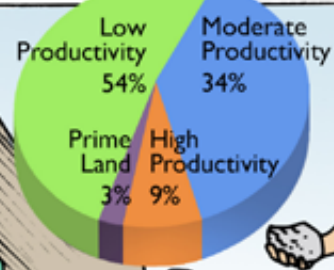
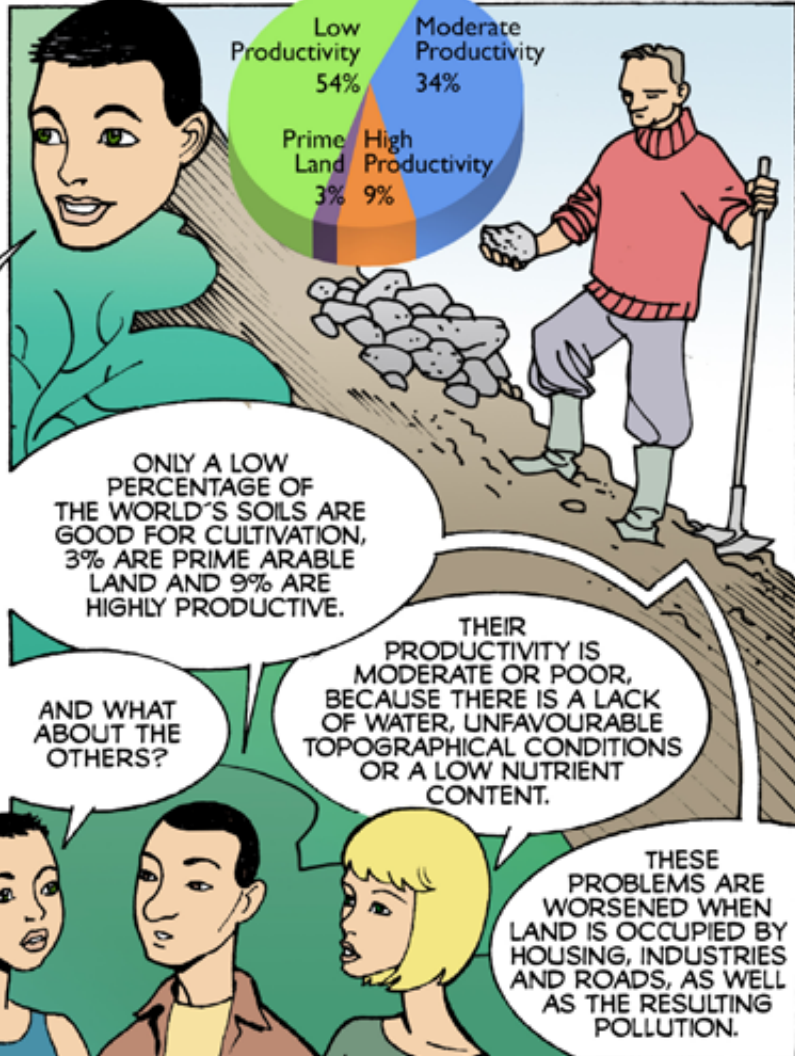
IN SOME AREAS THEY DIDN'T, BUT IN OTHERS THEY KNEW HOW TO DO IT PROPERLY. LOOK AT THOSE VINEYARDS ON SUCH STEEP SLOPES, THEY ARE REALLY WELL CONSERVED!

LIKE IN THE RIBEIRA SACRA, IN SPAIN'S MOST NORTHWESTLY CORNER, GALICIA? THEIR WINE IS REALLY GOOD!



IN OTHER AREAS WITH A LOT OF SLOPING LAND, THEY LEARNT TO BUILD TERRACES AND SO THEY COULD FARM THE LAND WITHOUT THE RAIN WASHING AWAY THE SOIL BY EROSION.

I THINK WE SHOULD LEARN MORE ABOUT THESE TRADITIONAL METHODS FOR CONSERVING THE LAND.



ONLY A LOW PERCENTAGE OF THE WORLD'S SOILS ARE GOOD FOR CULTIVATION, 3% ARE PRIME ARABLE LAND AND 9% ARE HIGHLY PRODUCTIVE.

THEIR PRODUCTIVITY IS MODERATE OR POOR, BECAUSE THERE IS A LACK OF WATER, UNFAVOURABLE TOPOGRAPHICAL CONDITIONS OR A LOW NUTRIENT CONTENT.

AND WHAT ABOUT THE OTHERS?

THESE PROBLEMS ARE WORSENERD WHEN LAND IS OCCUPIED BY HOUSING, INDUSTRIES AND ROADS, AS WELL AS THE RESULTING POLLUTION.



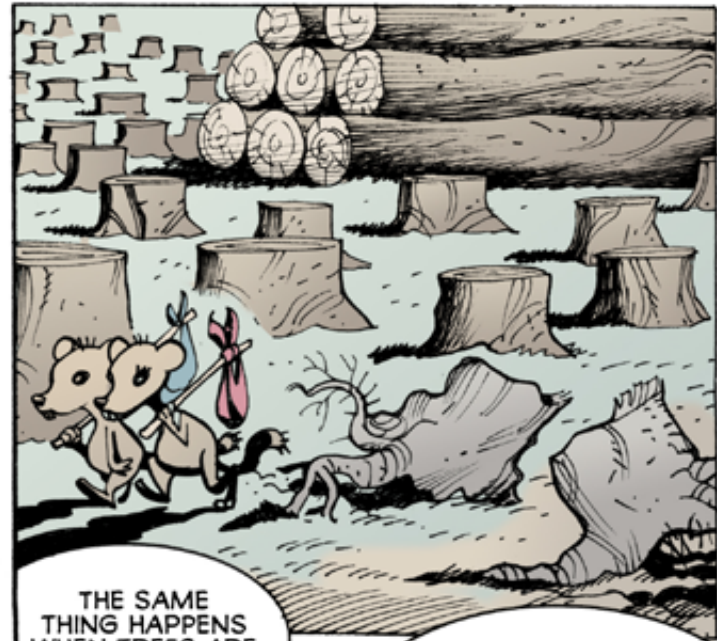
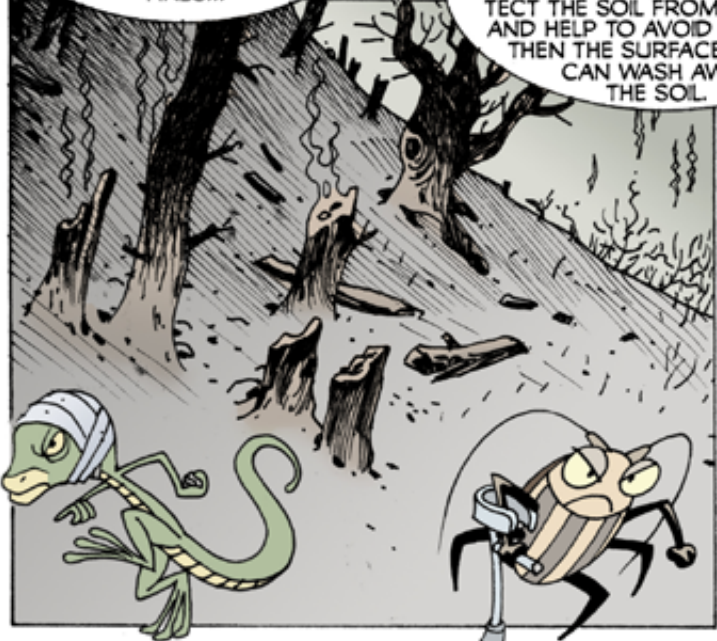
NOT ALL SOILS CAN BE USED FOR AGRICULTURE OR SILVICULTURE AND BESIDES, THEY ARE CONSTANTLY BEING DAMAGED, FOR EXAMPLE BY FOREST FIRES...

FIRES? BUT SOIL DOESN'T BURN!

BUT WHEN PLANTS ARE BURNT, THEY CAN NO LONGER HOLD THE SOIL IN PLACE WITH THEIR ROOTS AND THEY CANNOT PROTECT THE SOIL FROM THE RAIN AND HELP TO AVOID EROSION, THEN THE SURFACE WATER CAN WASH AWAY THE SOIL.

IF THERE IS NO VEGETATION COVER, SOIL IS WASHED AWAY BY WATER AND CAN DISAPPEAR.

WHAT'S MORE, WITHOUT PLANTS, WHAT WOULD WE EAT?



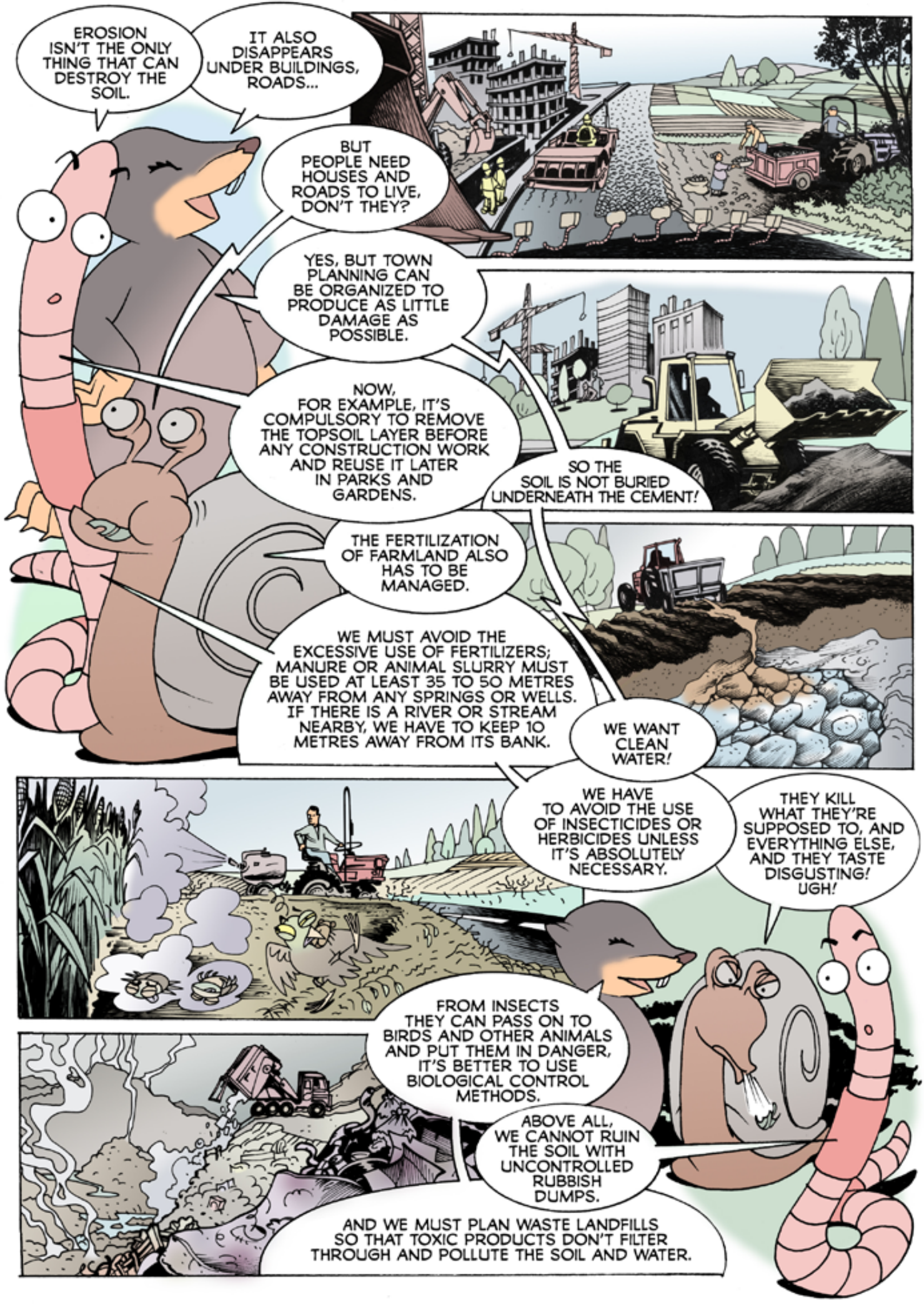
THE SAME THING HAPPENS WHEN TREES ARE CUT DOWN.

OH DEAR, THE SOIL IS REALLY DELICATE!

THAT'S WHY IT NEEDS PLANTS TO PROTECT IT FROM THE WIND AND THE RAIN...

THERE ARE CERTAIN SIGNS THAT CAN HELP US IDENTIFY EROSION, SUCH AS CHANNELS AND GULLIES, DEPOSITS AT THE FOOT OF HILLS...





EROSION ISN'T THE ONLY THING THAT CAN DESTROY THE SOIL.

IT ALSO DISAPPEARS UNDER BUILDINGS, ROADS...

BUT PEOPLE NEED HOUSES AND ROADS TO LIVE, DON'T THEY?

YES, BUT TOWN PLANNING CAN BE ORGANIZED TO PRODUCE AS LITTLE DAMAGE AS POSSIBLE.

NOW, FOR EXAMPLE, IT'S COMPULSORY TO REMOVE THE TOPSOIL LAYER BEFORE ANY CONSTRUCTION WORK AND REUSE IT LATER IN PARKS AND GARDENS.

SO THE SOIL IS NOT BURIED UNDERNEATH THE CEMENT!

THE FERTILIZATION OF FARMLAND ALSO HAS TO BE MANAGED.

WE MUST AVOID THE EXCESSIVE USE OF FERTILIZERS; MANURE OR ANIMAL SLURRY MUST BE USED AT LEAST 35 TO 50 METRES AWAY FROM ANY SPRINGS OR WELLS. IF THERE IS A RIVER OR STREAM NEARBY, WE HAVE TO KEEP 10 METRES AWAY FROM ITS BANK.

WE WANT CLEAN WATER!

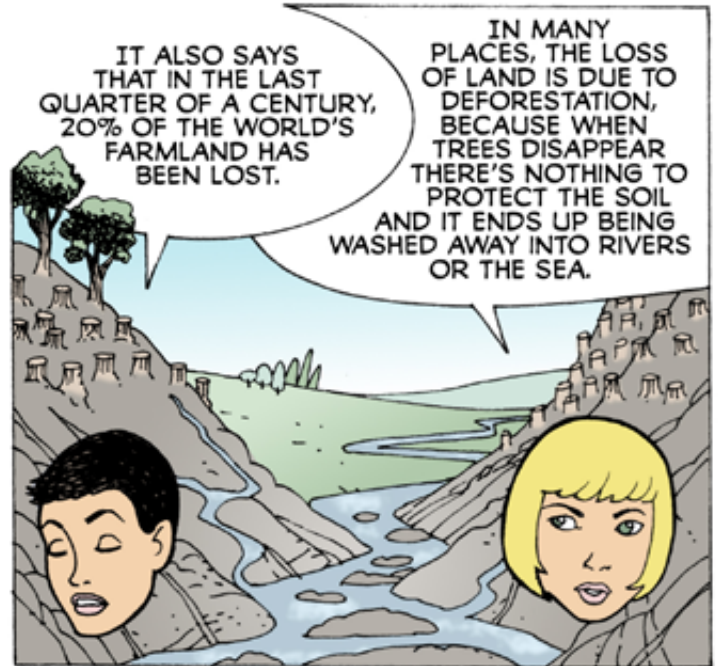
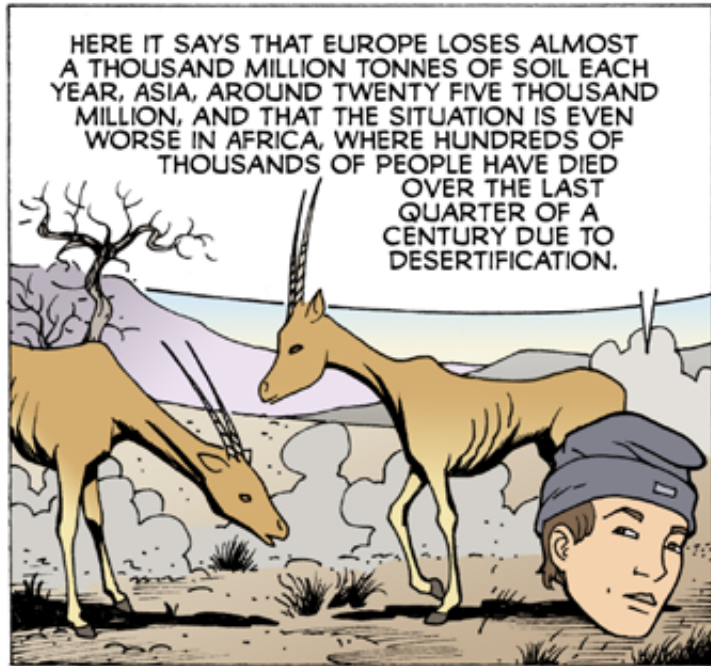
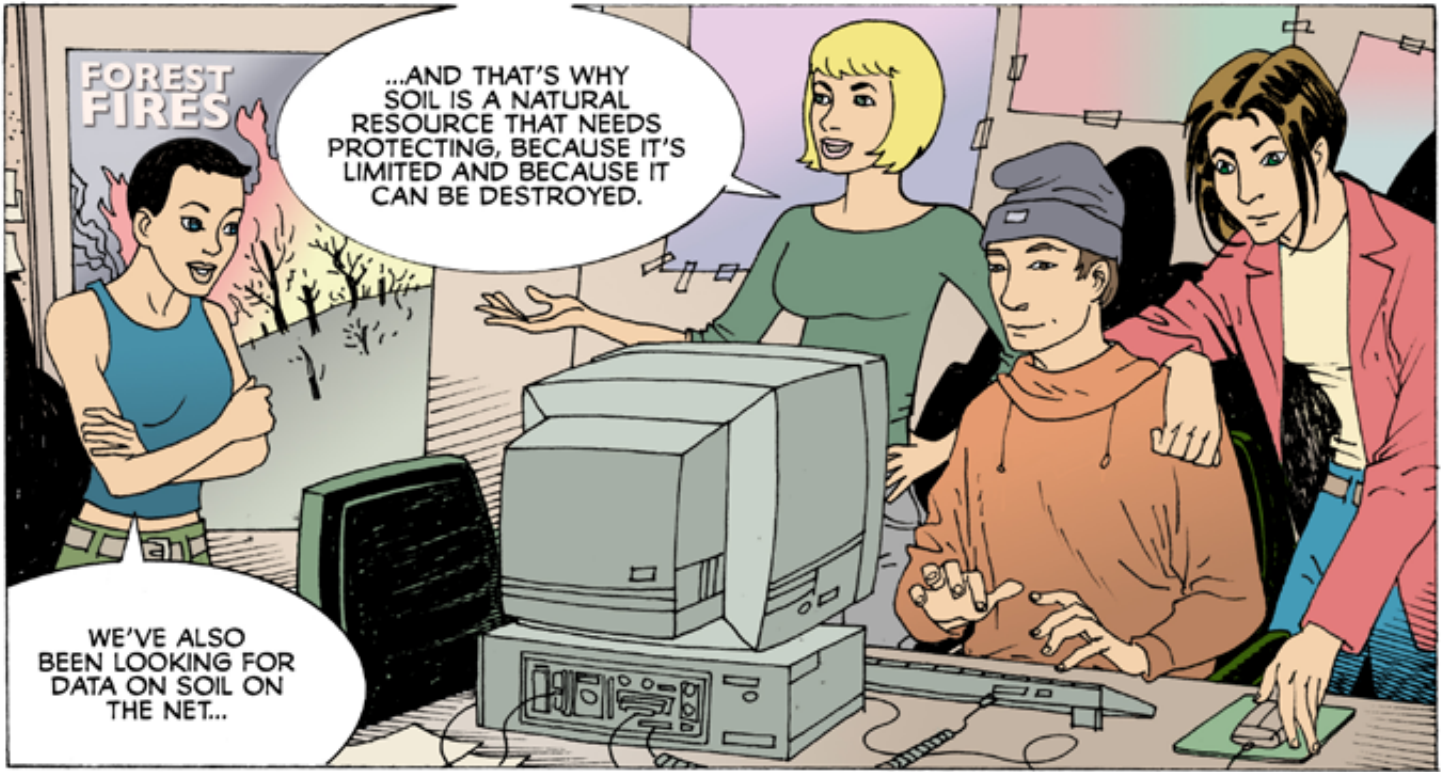
WE HAVE TO AVOID THE USE OF INSECTICIDES OR HERBICIDES UNLESS IT'S ABSOLUTELY NECESSARY.

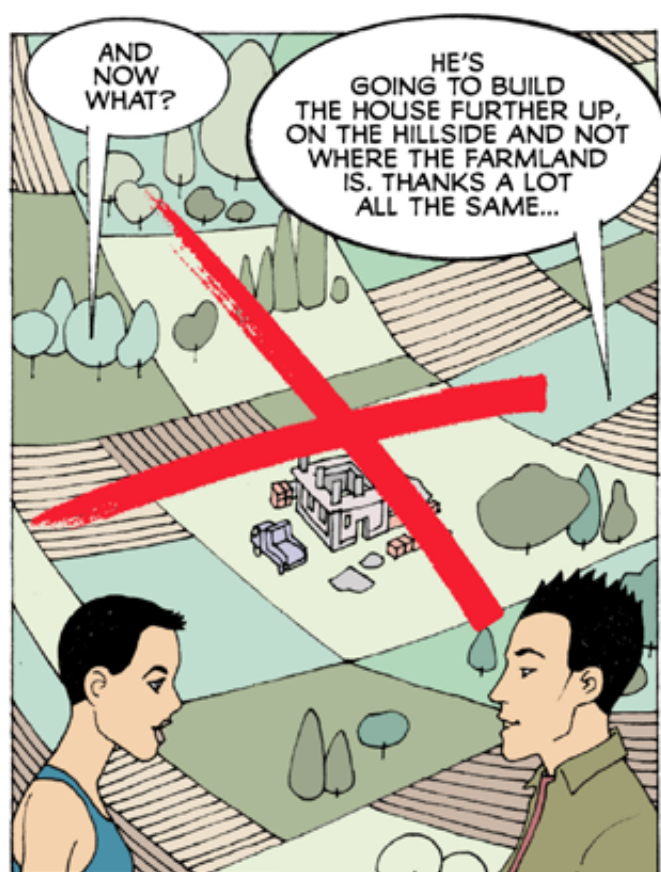
THEY KILL WHAT THEY'RE SUPPOSED TO, AND EVERYTHING ELSE, AND THEY TASTE DISGUSTING! UGH!

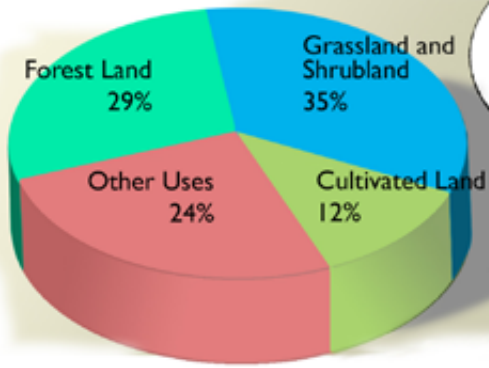
FROM INSECTS THEY CAN PASS ON TO BIRDS AND OTHER ANIMALS AND PUT THEM IN DANGER, IT'S BETTER TO USE BIOLOGICAL CONTROL METHODS.

ABOVE ALL, WE CANNOT RUIN THE SOIL WITH UNCONTROLLED RUBBISH DUMPS.

AND WE MUST PLAN WASTE LANDFILLS SO THAT TOXIC PRODUCTS DON'T FILTER THROUGH AND POLLUTE THE SOIL AND WATER.







IN THE WORLD FARMLAND IS SCARCE. ONLY HALF OF IT CAN BE USED FOR AGRICULTURE. AND CROPS ARE THE BASIS OF FOOD PRODUCTION.

BUT THERE'S STILL A LOT OF SOIL IN THE WORLD THAT ISN'T BEING PUT TO GOOD USE, ISN'T THERE?

NOT AT ALL! 87% OF THE AVAILABLE SOIL IS ALREADY BEING CULTIVATED AND IT'S HARDER AND HARDER TO FIND SOIL THAT IS APPROPRIATE FOR FARMING.

THAT'S WHY IT'S SO IMPORTANT TO CONSERVE THE GOOD QUALITY OF THE SOIL WE DO HAVE.

THE FOREST FLOOR SHOULD BE KEPT CLEAN TO AVOID FIRES AND WHEN THE UNDERGROWTH IS CUT, IT'S BETTER TO SHRED IT AND LEAVE THE FOREST REMAINS ON THE GROUND, NOT BURN THEM.



REFORESTATION SHOULD BE DONE CAREFULLY SO AS NOT TO DAMAGE THE SOIL.

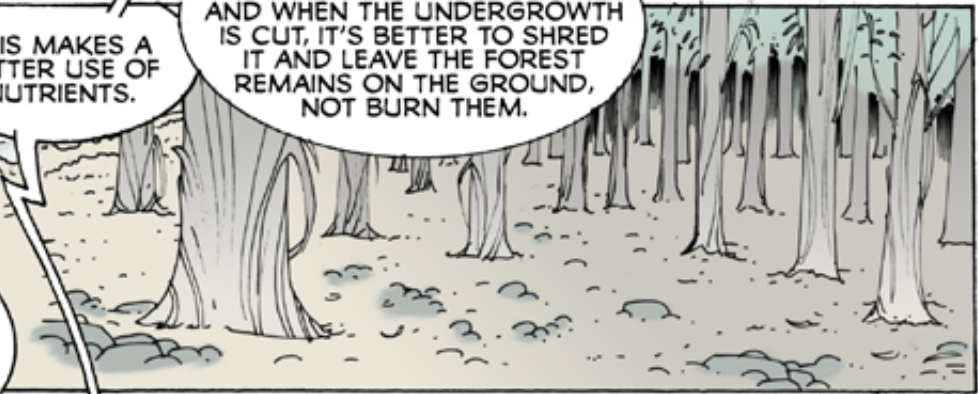
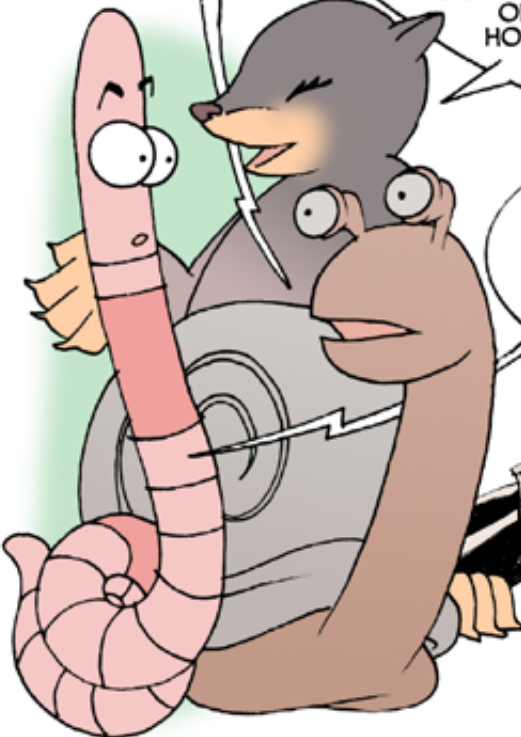
THIS MAKES A BETTER USE OF NUTRIENTS.

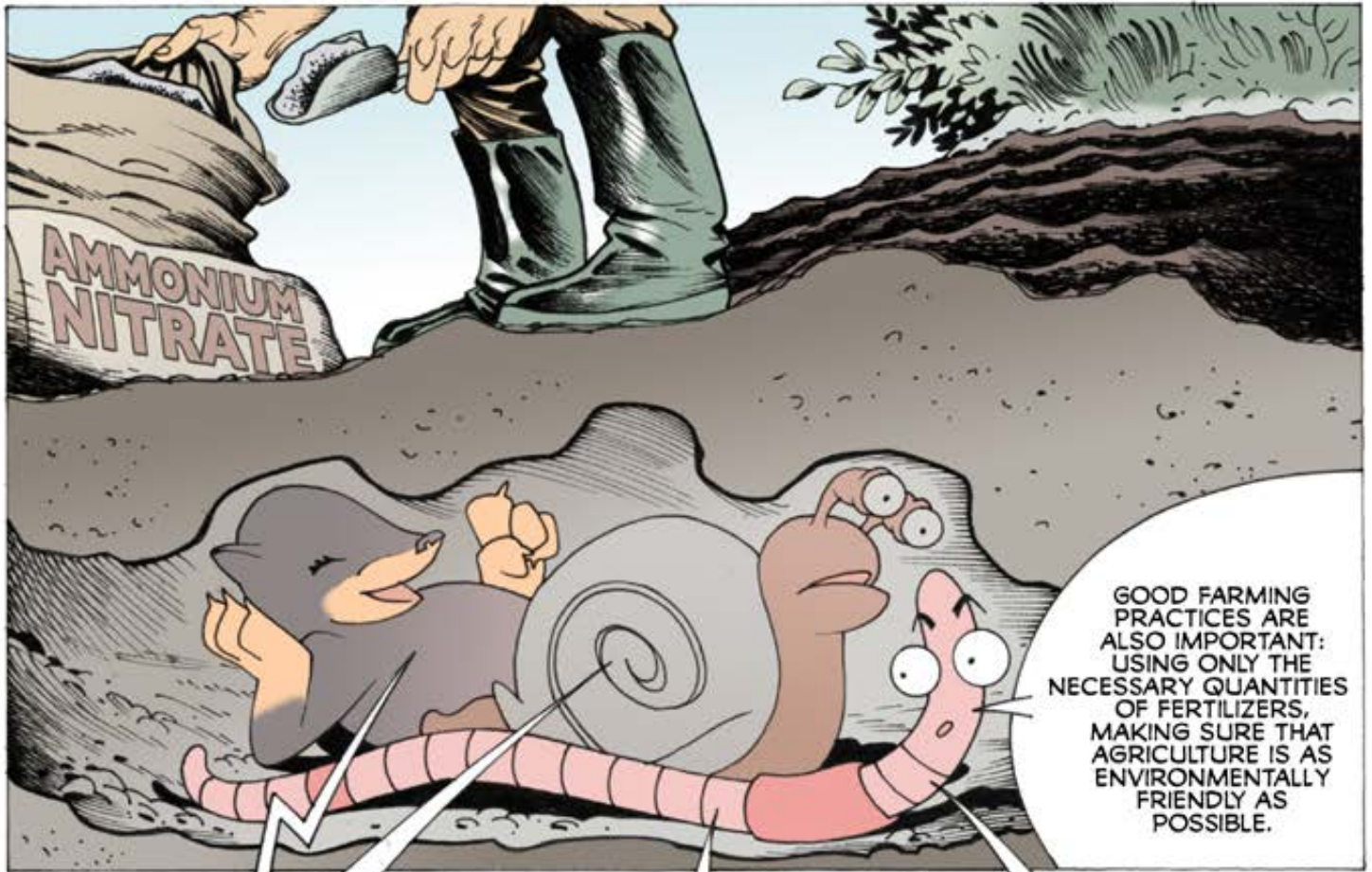
TREES THAT GROW QUICKLY, LIKE PINE AND EUCALYPTUS TREES, SHOULDN'T BE PLANTED TOO CLOSE TOGETHER OR CUT DOWN AT THE SAME TIME.

ONE OF THE BEST THINGS WE CAN DO FOR OUR SOILS IS TO MAINTAIN THE COVER LAYER OF VEGETATION, BECAUSE THE ROOTS HOLD TOGETHER THE SOIL AND BESIDES, GRASS AND PLANTS PROTECT IT FROM BEING WASHED AWAY BY WATER.

MAINTAINING VEGETATION IS IMPORTANT EVERYWHERE, ESPECIALLY WHERE RIVERS RISE.

ON THE OTHER HAND, WITHOUT VEGETATION, THE SOIL RUNS THE RISK OF BEING WASHED AWAY BY EROSION.





GOOD FARMING PRACTICES ARE ALSO IMPORTANT: USING ONLY THE NECESSARY QUANTITIES OF FERTILIZERS, MAKING SURE THAT AGRICULTURE IS AS ENVIRONMENTALLY FRIENDLY AS POSSIBLE.

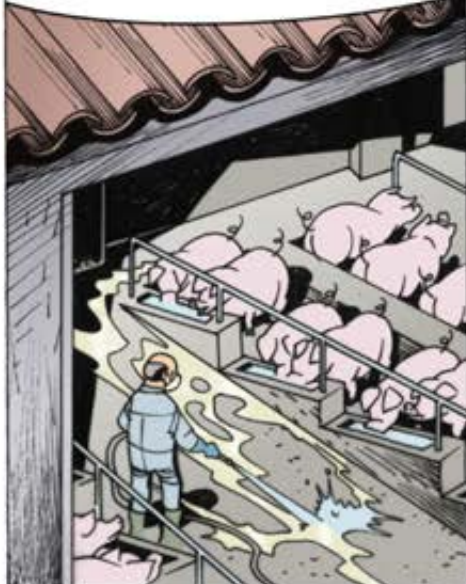
WE MUST BE CAREFUL WITH MANURE AND ANIMAL SLURRY: ALTHOUGH THEY CAN BE USEFUL AS FERTILIZERS, USED IN EXCESS, THEY CAN POLLUTE THE SOIL AND WATER.

THAT'S WHY IT'S IMPORTANT TO PROPERLY MANAGE MANURE AND SLURRIES USED ON CATTLE FARMS AND TO PREVENT POLLUTION CAUSED BY DISCHARGES ON SOIL OR INTO WATER. THEY MUST BE STORED AND TREATED BEFORE BEING APPLIED TO SOIL.

URBAN AND INDUSTRIAL WASTE SHOULD BE MANAGED APPROPRIATELY.

CHANGE YOUR CAR OR TRACTOR ENGINE OIL AT A GARAGE, WHERE THEY RECYCLE THE OIL, AND NOT IN THE MIDDLE OF THE COUNTRYSIDE! THE LITTLE MONEY YOU SAVE COSTS DEARLY TO THE ENVIRONMENT.

SOIL ISN'T AN ENORMOUS RUBBISH DUMP. IF WE RECYCLE MORE AND PRODUCE LESS WASTE, WE WON'T NEED SO MUCH LAND TO STORE OUR RUBBISH. SOIL IS A NON-RENOVABLE RESOURCE AND NEEDS PROTECTING! COLLABORATE!





Soil is one of humanity's most precious assets.

It allows plants, animals and man to live on the Earth's surface.

Soil is a limited resource which is easily destroyed.

The use of the soil should consider the needs of today's and tomorrow's society.

Soil must be protected against erosion and pollution.

(from the "European Soil Charter, 1972, Council of Europe")

