

# GREEN INHERITANCE

Anthony Huxley

FOREWORD BY  
David Attenborough



The World Wildlife Fund Book of Plants



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The World Wildlife Fund Book of Plants

**Anthony Huxley**

Foreword by David Attenborough

Four Walls Eight Windows, New York

This book was written by Anthony Huxley with the help of the World Wildlife Fund and the International Union for Conservation of Nature and Natural Resources.

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### ► Hydrophytum

Hydrophytums enjoy "mutual benefit" living arrangements with ants. Tree-dwelling species of the South-east Asian jungle, they have fleshy tubers in which ants tunnel dwelling chambers. In return for shelter and nectar, the ants protect the plants against intruders, and transport their seeds to new sites.

### ▼ Venus Flytrap

The carnivorous Venus's Flytrap (*Dionaea muscipula*) operates a hair-spring trap to catch its prey. The bristle-edged leaflobes each have three trigger hairs on the surface. If one is touched, nothing happens; but if two or three are, the trap closes within a quarter-second.

### ▲ Bladderwort

The aquatic Bladderworts (*Utricularia*) carry tiny traps like miniature lobster-pots on their submerged stems. If a water-creature, like *Daphnia*, brushes an external trigger-hair, an airtight lid on the pot opens inwards and the prey is sucked in.

### ▲ Butterwort

Insect-eating Butterwort (*Pinguicula*) invented fly-paper before we did – small insects alighting on this bog plant's sticky leaves are stuck fast. Glands on the surface then exude more sticky juice, and an acid fluid which dissolves the prey. Meanwhile, the edges of the leaf curl slowly inwards, and enclose the insect.

### ▼ Nepenthes

Plants of several families have "pitchers" to trap insects. *Nepenthes* have lidded pitchers at leaf-ends to entice with an attractive odour and nectar-like fluid on the rim. But down-pointing barbs and waxy walls ensure a one-way trip into a digestive liquid at the bottom.

### ▲ Sundew

Sundews (*Drosera*) make doubly sure of their victims: the red hairs covering the leafpads each carry a glistening drop of very sticky clear fluid. Any insect attracted by these droplets, like the lacewing here, becomes stuck fast, while other hairs gradually bend around and pin it to the centre of the leafpad, which bears acid-secreting glands. Biggest of the sundews, *D. regia* from South Africa has leaves 60 cm long.



### ▼ Bucket orchid

The bizarre Bucket Orchids (*Coryanthes*) show how to make an insect pollinator look ridiculous! Bees suck attractive fluid on the edges of the huge lips, become inebriated, and fall into the liquid-filled "bucket". They can only escape by squeezing under the flower's sexual organs: it may take a bee thirty minutes to wriggle out – yet it will return and so carry out cross-pollination. The Orchid family has the most complex pollination method of any family, usually involving one species of insect to each species of orchid.

### ► Bee orchid

Bee Orchids (*Ophrys*) depend for pollination on deluding male insects into mistaking their flowers for desirable females: they have the right odour, pattern and degree of hairiness. Once alighted on a flower, the male insects attempt to copulate.

### ◀ Arum maculatum

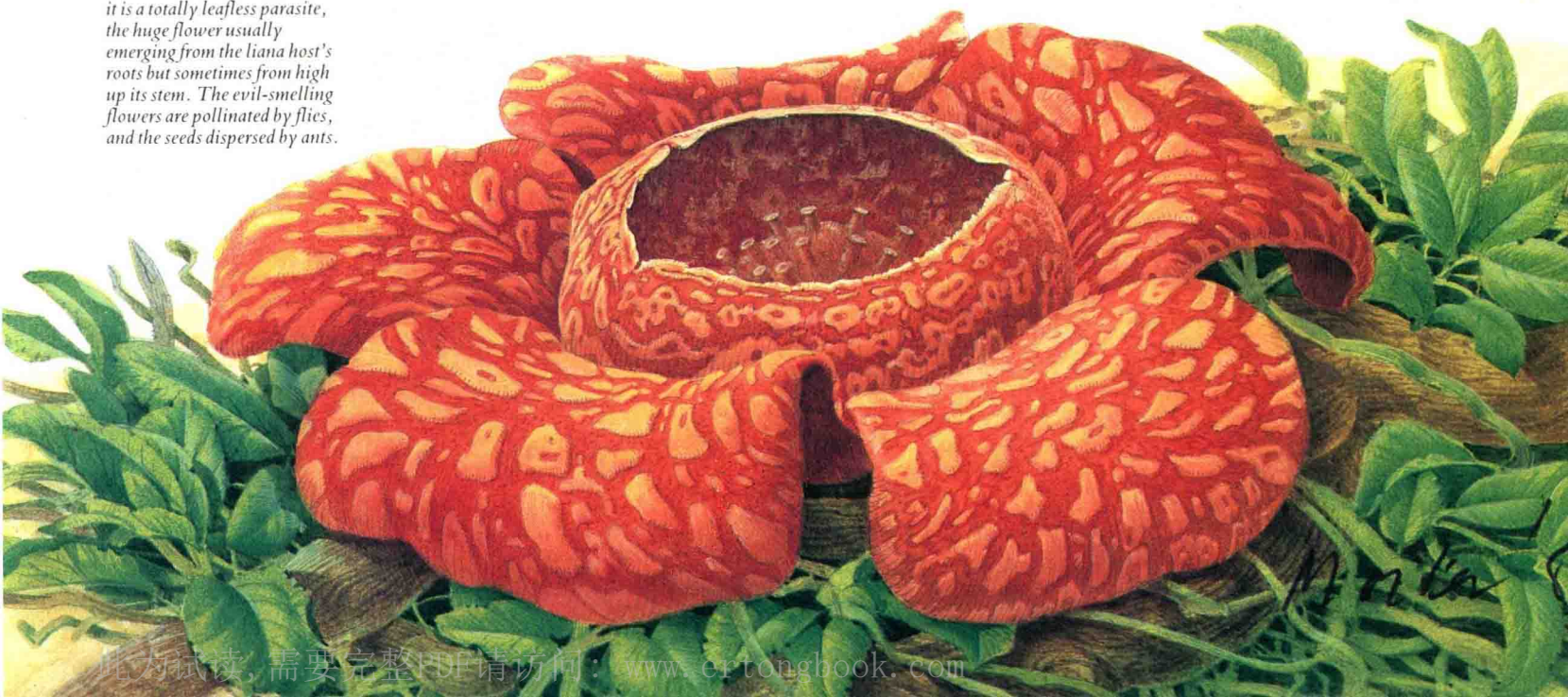
When ripe for pollination, Lord-and-Ladies (*Arum maculatum*), give off a powerful odour to attract insects. Midges crawl on the female flowers at the base of the tube (the males are above). The central hairs allow midges to enter, but not to leave until the pollen is shed on them.

### ► Ceropegia

*Ceropegia haygarthii* waves a hairy, club-shaped organ to attract insects. Odour then leads them to the slippery chute of the flower proper, which restrains them till their pollinating work is done, when the bloom tips to release them.

### ▼ Rafflesia

One species of *Rafflesia* wins the record for the biggest flower in the world. A metre across, its size is doubly amazing because it is a totally leafless parasite, the huge flower usually emerging from the liana host's roots but sometimes from high up its stem. The evil-smelling flowers are pollinated by flies, and the seeds dispersed by ants.



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# GREEN INHERITANCE







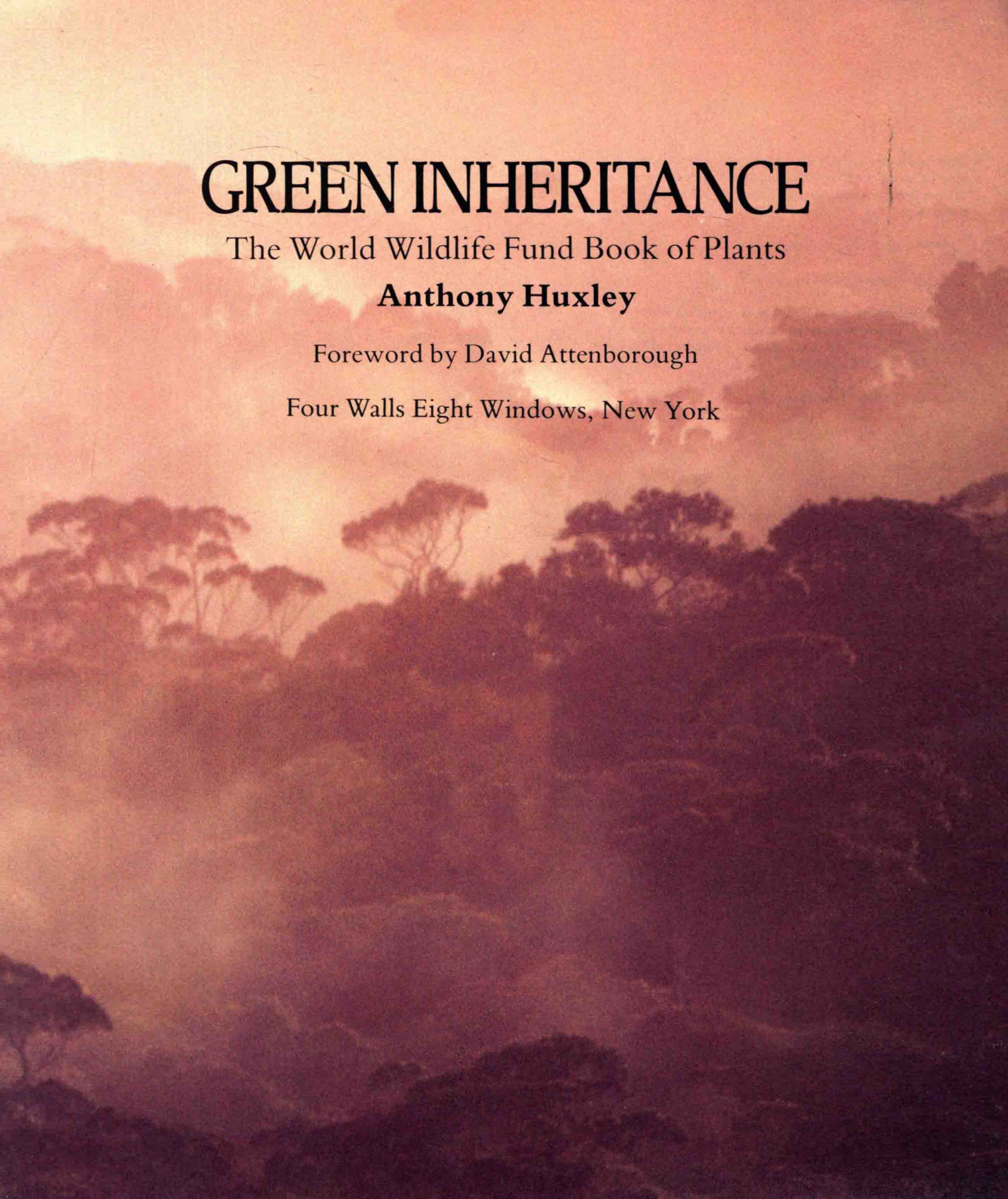
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For Zoë  
who is part of the future

The aim of this book is to show, before it is entirely too late, just how rewarding our green inheritance is to mankind – to demonstrate the wonder and worth of plants, and their great potential, to explain why they cannot take any more punishment, and to point out how those that remain can be saved. And indeed, we must save them, because each plant that becomes extinct represents a loss to ourselves.

Plants have fed the world and cured its ills since life began. Now we are destroying their principal habitat at the rate of 20 hectares every minute.





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## *Foreword*

The need for this book has never been greater. Never has it been more urgent or more important that the message it carries should be widely heard and understood. For what it makes marvellously and soberingly clear is the extent of our dependence upon plants.

Plants provide us with power. In many places, people burn them to cook their food and to keep themselves warm. Even in industrialised parts of the world, fossilised plants, in the form of coal and oil, give us most of the energy with which we run our machinery and illuminate our cities. Nearly half of all our drugs are based on substances that are derived from plants. Plants maintain the level of oxygen in the very air we breathe. And who can quantify the joy that their beauty brings to our spirits?

Indeed, animals could not exist without plants, for all – including humans – rely upon them for food. Even the lion that lives on antelope is eating plants, as it were, second-hand. As the Bible says, all flesh is grass. Putting that truth into different words, plants alone have the ability to combine atoms of carbon, oxygen, hydrogen and nitrogen and produce the complex molecules that are the building blocks of living tissue and the essential food of animals. So plants not merely sustain all forms of life, but continuously re-enact the ultimate and fundamental miracle of turning the non-living into the living.

Obvious though our dependence upon plants may be, we have, it seems, taken it for granted that they will continue to exist in all their variety no matter how we treat them and the land on which they grow. The initial concern of many conservation organisations was to protect rare animals. Maybe it was the very mobility of birds and mammals that first attracted our attention to them and diverted our care from the green organisms that remained stationary, rooted to the ground. But slowly, people began to realise that the survival of the animals about which they were concerned depended on the continued existence of plants – and, nearly always, upon particular kinds. If you want the yearly delight of butterflies in a garden, you must grow special things – buddleias and nettles, honeysuckle and bramble. And if you want to keep giant pandas, you have to grow bamboo!

Initially, the main problem seemed to be with preserving the butterfly and not the nettle, the panda, not the bamboo. Many plants, after all, can be kept as seeds in a packet, transported from one site to another by post if



needs be, and brought to life by a little judicious watering. Surely *they* could not be endangered too. Now, to our cost, we know better.

No one is certain exactly how many different species of plant exist. A reasonable guess is that there are about a quarter of a million flowering plants alone. Two-thirds of these grow in the tropics. Yet it is precisely there that their destruction is proceeding the fastest. We need no longer guess at how quickly that is happening. Satellites can show us only too clearly. The photographs they produce differentiate between forested and unforested land, and every year ten thousand square kilometres of trees are disappearing. Of the 80,000 species of plants growing in South America, only about 1 per cent have been examined to see what value they might have as food, or for medical or any other purpose. So, year after year, we are destroying species without even knowing what we are losing. All over the world, we are draining marshlands, felling mangrove forests, ploughing up grasslands, and spreading lethal plant poisons. Worldwide, there are, at the moment, about 60,000 species in possible danger of extinction.

The World Wildlife Fund and the International Union for Conservation of Nature have decided to make a sustained effort to halt this devastation and are involved in a world-wide campaign to save the plants that save us.

This book is a major element in that campaign. Its illustrations have been selected from, among other sources, the rich library of drawings assembled by the premier Botanical Gardens in the world at Kew, in England; many of its facts have been supplied by research scientists belonging to the IUCN; and the whole has been put together by Anthony Huxley, a botanist who is as knowledgeable about the nature, distribution and value of plants as he is skilled in actually growing them, whose breadth of vision is matched by his invaluable ability to express the findings of his science in the simplest of words. You will not find here strings of those baffling adjectives – glabrous and glaucous, oblanceolate and indehiscent – to which so many botanists are attached and which so many non-botanists find such a barrier to comprehension. In chapter after revelatory chapter, Anthony Huxley unveils the beauty and wonder of the plant kingdom and shows just how intimately our lives are bound up with it. Perhaps his wisdom and his vision will at last persuade us to set about the task of protecting what he describes with such clarity. It will not be before time.

A handwritten signature in black ink, reading "David Attenborough". The signature is fluid and cursive, with the first name "David" and the last name "Attenborough" clearly legible.





*Each specialised habitat on earth has plants adapted to life there, like the cordgrass on this North Carolina saltmarsh.*



# *The Green Inheritance*



Plants are very familiar. They tend to be taken for granted and regarded with placid affection rather than with the fascination and interest they deserve. For most people they are part of the view, whether open country, farmland, or townscapes with street trees. Yet they are unique among the organisms with which we share this planet, for they alone contain the pigment chlorophyll which allows them to derive their energy from light. Outwardly, "They toil not, neither do they spin", but inwardly they are highly active and amazingly complex chemical-producing factories.

There is more than one view of plants. To the more comfortably off they include garden or park plants for leisure and pleasure, and the indoor pot plants which provide for town dwellers that contact with the green wild world that seems to be an instinctive need.

By contrast, many people in developing countries depend very heavily on plants, but look at them hardly at all from the standpoint of beauty or solace. Crops are there to be cultivated, often with extreme sweat and toil, and wild plants to be exploited directly. The overwhelming need for fuelwood and grazing for animals is frequently totally unselective.

We use plants in every field of life and have long ceased to rely on those native to our own area. The average Northerner has foods, products, and material contributed by plants from all over the world, many grown far from their original homelands – exotic hardwoods from the tropics for TV sets and tennis racquets, fruit and vegetables from around the world, insecticides from chrysanthemums, medicine from the Himalayan Opium Poppy or the Andean Coca, spices from the East, dyes from Asia, polishes from the jungle, toiletries from Jojoba, grown in the desert; pot plants from the tropics, oils from the Mediterranean Olive; Soya from Brazil; Cotton, Sisal, Rubber – the list is almost endless.

Not very long ago, the plant world seemed inexhaustible, always reasonably renewable. Today it is all too clear it is not. Nevertheless, we continue to wrench plants from the ground or destroy their environment and, whether for reasons of pressing immediate need or for greed, eradicate natural plant life as we do so. It is a sad fact that few people, whether the local tiller of soil or the modern entrepreneur, have any real regard for the world of plants, either for the plants' sake or for their own. The wild plant is in deep trouble; there is no mistaking that.