

# 广东热带沿海侵蚀地的植被重建

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1958年12月,中国科学院在北京召开了植物学工作会议,根据党和政府提出的要在全中国范围内逐步实现园林化的指示,在本院的植物学科规划里安排了一个“植被改造自然”的项目。其任务是利用植被改造各种类型的荒山、荒地、沙漠、盐碱地和水土流失地区等恶劣的生境,使之彻底改变自然面貌,同时发展生产、安定生活。

这个研究项目中规定了南方红壤地区的研究任务是水土流失地区的植被恢复、改善生态环境和发展生产。中国科学院华南植物研究所根据这项任务,选定了电白县水土流失最严重的潭巴公社丘陵台地作为试验研究对象,并于1959年3月派出了包括植物、土壤和气象三个专业的工作队,与该地的鉴江平原水土保持试验推广站(现改名为电白县水土保持试验推广站)协作,在6000多亩寸草不长的“光板地”上,采取工程措施与生物措施相结合的方法,开展水土流失地区植被重建的试验。

水保站的试验地位于广东省电白县的沿海台地上,居于北纬 $21^{\circ}27'49''$ ,东经 $110^{\circ}54'18''$ ,属热带北缘地区。这里年平均气温为 $23^{\circ}\text{C}$ ,年降雨量在1500—1700毫米之间,但有明显的干、湿季之分。地带性土壤为砖红壤。地带性典型植被类型是与季风热带气候相适应的多层次、多树种、常绿性的热带季雨林。可是,原生林已遭破坏殆尽,仅在村边尚残存一些次生林,即村边风水林(见彩色照片1)。

热带森林的生物量巨大、生物资源丰富和稳定自然生态平衡的作用显著,但热带林又是一个脆弱的生态系统,一旦遭到反复破坏,在高温、多雨、风大等自然条件的综合作用下,最易造成水土流失,严重的程度可以达到寸草不生的“光板地”(彩色照片2—7)。

此地水土流失达100年历史,平均每年冲刷表土1厘米,每平方公里每年流失10,000立方米泥沙。土壤有机质从4.0%降到0.6%以下。结果造成环境恶劣、生产落后和生活困苦。显然,这是破坏森林的恶果,也是大自然给人类报复的见证。

水保站从1959年开始的植被重建试验工作分三步走:一、使用耐旱、耐瘠的植物,特别着重于固氮植物,营造“先锋群落”(彩色照片8—10),以便对恶劣的环境稍加改善,为

后来植物的生长创造条件。二、模拟热带自然林，营造多层、多种的阔叶混交林（彩色照片11—16），以替代马尾松林和桉树林。三、在治山治水改造自然的同时，在林内开辟块状的热带经济植物栽培场地，开展多种经营，发展热带作物和果树（彩色照片17—21）。

经二十年试验研究，水保站范围内的6500亩不毛荒坡已恢复到全部有桉树或马尾松纯林的先锋群落，并有500多亩已进一步改造为多层结构、多树种混交的阔叶林和各种热带经济植物栽培场地。水土流失基本上受控制，小环境条件已获改善。在这片原来的不毛之地上目前已安置了水保站工作人员及家属共100多人定居下来。该站的生产收入已能提供大部分经费开支，减轻了国家负担。附近农村水稻的年亩产量已从70—150斤/亩提高到1400—1600斤/亩，实现了生产、生活和环境条件改善三方面兼顾。

小良水保站的水土流失地区植被恢复的试验取得了生态效益、经济效益和社会效益三方面的效果，符合当前国际上生态农业理论的要求，因此该站已被列为中央水利部的开放单位，近年来国内、外水保、林业、环保等专业代表团曾多次来水保站参观、交流经验。中国科学院也于1979年将该站列为热带人工森林生态系统定位研究站，与水保站继续协作进行生态系统结构、功能和生物生产力的定位研究（彩色照片22—26）。参加单位增加了广州地理研究所、广东省昆虫研究所等，共包括植物、昆虫、鸟、兽、土壤动物、微生物、土壤、气候、地貌和水文等专业的科研课题。

### 参 考 文 献

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# THE STUDIES ON THE RECONSTRUCTION OF VEGETATION IN TROPICAL COASTAL ERODED LAND IN GUANGDONG

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## Abstract

The experimental area is located in the coastal lowland of Dian Bai County, Guangdong, 21°27'49" N and 110°54'18" E. It is the northern margin of the tropics. The annual average temperature is 23°C. The annual rainfall is 1500-1700mm. The zonal soil is lateritic soil. The climax is tropical monsoon forest. By reason of human activities, the primary forest had been destroyed entirely, the remain is the secondary tropical monsoon forest (geomancy forest beside villages).

The biomass, the living species and the effect of ecological equilibrium in tropical forest are highest among the ecosystems. But the tropical forest is also a weak ecosystem. After it is destroyed, in the integrated influence of high temperature, plentiful rainfall and strong wind, water loss and soil erosion will occur, and the forest will become barren land without plants.

The erosion of this area has a long history more than hundred years. The average depth of eroded surface soil is 1 cm/year. The loss of soil is 10000m<sup>3</sup>/km<sup>2</sup>/year. The content of humus decreases from 4.0% to 0.6% or less. The results of deforestation in this area are bad environment, low production and poor human life. It is a testimony of the revenge to man by nature.

The join studies on the reconstruction of vegetation to transform the nature in this bare eroded area were carried out by The South China Institute of Botany, Academia Sinica and The Xiao Liang Station of Water and Soil Conservation, Dian Bai County at 1959. The aim of the studies was to find the way and theory of reconstruction of tropical forest vegetation, and to establish a model of improvement and utilization of tropical and subtropical mountainous and hilly wastelands. There were three stages in the experiments.

1. The first stage: Using the plants of drought and sterility resistance to construct the pioneer community. The bad environment was reformed

slightly. The afforestation has been established on 400 ha. barren land. Water loss and soil erosion have been controlled. But new problems occurred at the same time. The *Pinus massoniana* was attacked by the insects fiercely. Herbs or grasses did not grow on the ground under the eucalypt forest.

2. The second stage: Using the natural tropical forest as the model, the experiments of plant introduction and construction of man-made communities have carried out at 1974-1979. The broad-leaf mixed forests of several stories and many species were constructed. The good results have been achieved.

3. The third stage: After the afforestation of the eroded hills and the improvement of the environment, the conditions for the development of industrial crops have been generated. During the processes to transform barren lands and to bring the water under control, a diversified economy in agriculture was developed to work out measures suited to local conditions. The tropical crops and fruit trees were grown. The Xiao Liang Station of Water and Soil Conservation attained a self-sufficient economy.

In the experiments of twenty years, the man-made tropical forests of several stories and many species have been constructed successfully on the fierce eroded barren land. The effective methods on the reconstruction of tropical forest vegetation have been sought. The model of improvement and utilization of tropical and subtropical mountainous and hilly wastelands has been established.

Since 1980, The Tropical Man-made Forest Ecosystem Stationary has been found, the permanent multi-disciplinary studies on forest ecosystem have been carried out by South China Institute of Botany, Academia Sinica, Guangzhou Institute of Geography and Guangdong Institute of Entomology. There were eight disciplines in the project, e. g. botany, entomology, zoology, microbiology, geomorphology, climatology and hydrology. More than twenty scientists joined in the studies. The equipments of laboratories and experimental fields have been set up.