M.R.O. 1—77,006—8-6-37.

(1) Number of pages 22 O

(2) Date of repair 7-9-38

(3) Initials of the Referencer

9

MADRAS RECORD OFFICE.

Government of Madras.

Revenue DEPARTMENT.

G.O. No.	371	Press ~~Mis.~~
Dated	28.5-1890.	

Not to be folded or roughly handled

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following letter from M. A. LAWSON, Esq., Government Botanist and Director of Government Cinchona Plantations, &c., Nilgiris, to the Secretary to Government, Revenue Department, dated Ootacamund, 13th May 1890, No. 7:—

With reference to G.O., dated the 3rd February 1890, No. 102, Revenue, I have the honor to forward a copy of my report on the cinchona mortality in the Wynaad.

2. Copies have been already forwarded to the Wynaad Planters' Association.

ENCLOSURES.

Report on the cinchona mortality in the Wynaad.

The disease, which is causing so much havoc on many of the cinchona estates in the Wynaad, may be briefly described as follows:—

Up to the fourth or fifth year after planting, the young trees have a healthy appearance, whole plantations presenting a bright green color, which indicates that the plants are up to this age perfectly sound. After this period, some of the trees in the field begin to flower and to produce seed profusely; the leaves too turn a ruby red in the dry season. This early flowering and fruiting and change of color in the leaves indicates that the tree is beginning to become unhealthy. In another year, many more of the trees go off in the same manner, till at last the whole plantation may be so affected, and ultimately perish. The symptoms of approaching death are as follows:—

In the first place, as I have said above, the trees begin to flower and fruit at an early age and many of the leaves turn red in the dry season and fall off prematurely. In the next year, various portions of the tree may become specially affected; canker (that is, the destruction of the Cambiam layer, which causes the bark to become dry and cracked) may set in on various parts of the stem and branches. If this canker attacks a branch, that branch dies, while the rest of the tree may continue to exist, but if the canker attacks the collar or base of the stem, so as to completely surround it, the tree is doomed. This latter form of canker is the most common and the trees suffering from it, as a rule, die from the top downwards. This canker is, I believe, in every case, caused by food starvation; there is no parasite disease of any sort to be discovered in any part of the tree, either by a superficial or microscopical examination. The view, therefore, that the trees die from some specific and infectious disease may be abandoned.

2. The soil in the Wynaad, as a rule, is poor, containing but a small amount of organic matter, and it is especially poor in nitrogenous substances, as will be seen from a perusal of Mr. Hooper's report on the subject, which I enclose. The soil is also in many places, from its physical properties, unsuited for the growth of cinchona; the amount of iron, which the soil contains, causes it to cake and form so hard a mass that the roots of the trees are not able to pass through it. The cinchona is a forest tree and not one which in its natural state grows in the open, and it requires the loose earth formed from the decomposition of leaves for its perfect growth.

3. Planters seem to have been too often misled in selecting sites for opening out plantations by the height of the indigenous trees growing upon the ground. When the forest has been high, they have concluded that the soil underneath must be both deep and rich; but this, on the steep slopes of mountains, where the rainfall is excessive, is by no means the case. Even while the forest trees are standing, the accumulation of leaf mould often does not exceed the depth of a few inches to a foot, and when the trees have been felled and the ground opened out and

planted, it not unfrequently happens that the whole of this surface soil is as completely cleared off by the rains as if it had been purposely swept away by a broom, and the hard red lateritic sub-soil is all that remains. One estate which was visited showed the effects of such denudation in a most remarkable manner; the estate was a large one, and the trees, the trunks of which were still lying on the ground, were felled some six years ago; the surface soil had over the greater portions of this estate been swept completely away, and nothing but the hard unnutritious sub-soil was left for the cinchona to feed upon. The cinchonas were dying off wholesale, and I have no doubt but that in another year or two there will scarcely be any of them left alive.

4. That the great mortality, which exists among the cinchonas of the Wynaad, is due entirely to food starvation and not to any specific disease may be gathered from the consideration of the following two common facts, which may be observed by any one everywhere:—

I. Cinchona trees may often be seen growing on two plots of ground adjoining each other, either plot having the same aspect, the same slope, and originally the same sort of soil; but the one has also coffee upon the ground and has therefore been highly cultivated and manured, while the other, upon which cinchona is grown, has received no cultivation, or, at the most, a mere pricking up of the surface with a fork, and also has received no manure. On the first plot, the cinchona trees, which again are planted further apart than on the other plot, present as beautiful and as healthy an appearance as anybody could wish to see anywhere, while on the second plot, where the tilling of the ground has been neglected and the trees planted much more closely, and, therefore, starving each other, show manifest symptoms of speedily dying.

II. The cinchona belongs to the same natural order of plants as the coffee. In its wild state, it inhabits similar stations, and what coffee likes it likes and what kills coffee kills it. Again, on most of the estates, where the surface soil has been washed off the steep slopes, it happens that this soil is caught in hollows and retained there, making a pocket containing highly nutritious soil, and, wherever this occurs, so long as the sub-soil is not constantly saturated with moisture, the trees in such places are seen to be healthy and vigorous in their growth, while death is spread all around them.

5. The only remedy for the disease is high cultivation. When first planted, the plants should be put into pits, at last 18 inches cube, and as soon as their roots have reached the sides of the pits, the adjoining ground should be broken up to the depth of the pit.

6. One gentleman in the Wynaad suggested that trenches should be dug eighteen inches deep and one foot broad and mulched with the common hill grass, a material which can be gathered in large quantities at little cost, and that these trenches should be made between every other row of trees. There is no doubt but that such treatment in a plantation would improve it greatly, especially if the trenches were crossed the succeeding year. The question to be determined is would this method of tilling the ground be cheaper than pitting. It probably would not be so in the first instance, but, as it would open out more of the ground than pitting, it ought in the end to be quite as economical.

Secondly, the more manure that can be given, the better will the trees thrive.

Thirdly, except on very rich soils, the trees should be planted much further apart than they are at present.

In former days, when the price of bark was high, it paid to plant close and when the trees had reached a certain age to thin them out; but now that the price of bark has fallen so low, this practice is no longer remunerative, and it would be better to plant not less than 8′×8′ for ledgers and 10′×10′ for hybrids or succirubras.

Fourthly, the taking of bark by shaving or stripping should not be begun so early in the trees' existence as is now customary, nor should the number of crops taken be so many.

7. In order that the trees may not be too much weakened they ought not to be barked before the sixth year after planting and afterwards only once in three years.

8. That the cultivation of cinchona in the Wynaad is doomed to go out is not to be believed, for, wherever it has been properly attended to, the trees on such estates present a most satisfactory appearance. There are also specimen trees, so large that, if uprooted, they would yield very considerably—over one hundred pounds of dry bark a piece. With such instances as these, no one can be justified in proclaiming that cinchona will not grow in the Wynaad and the only point to be repeated, and which ought to be repeated over and over again, is that some planters must pay more attention and spend more money over the cultivation of their estates than they do at present and not to be too eager to take too early or too numerous crops.

OOTACAMUND,
13th May 1890.

(Signed) M. A. LAWSON,
Government Botanist, &c.

From the Government Quinologist, to the Government [illegible]ist and Director of Government Cinchona Plantations, Nílgiris, dated Oot [illegible]und, 8th April 1890.

I have made an analysis of four samples of sub-soil taken from different parts of the Wynaad and representative of that in which the cinchona plants are grown.

The four samples were labelled, respectively—

(1) Pallacoon.
(2) Glenmary.
(3) Carpenculli.
(4) Alexandra.

Separated from the few stones present, powdered and sifted, the samples had the following appearance:—

(1) Bright reddish brown.
(2) Dull reddish brown.
(3) Reddish brown.
(4) Brown.

The soils were very similar in mechanical composition. They were ferruginous earths with variable amounts of quartz sand. Nos. 2 and 4 contained micaceous schist. They might be catalogued as light sandy soils, except No. 3, which contained an appreciable quantity of clay, and was, therefore, a sandy loam.

A chemical analysis revealed the presence and amount of the following constituents:—

—	1	2	3	4
Moisture	3·64	2·32	2·58	3·24
Organic matter and combined water	11·61	9·24	4·69	6·83
Soluble salts	·11	·13	·10	·09
Alkaline chlorides	·26	·46	·14	·22
Iron oxides and alumina	15·77	11·03	7·90	14·15
Lime	·26	·21	·14	·17
Phosphoric acid	·23	·16	·11	·21
Silicates and quartz sand	71·58	77·62	85·20	72·87

In comparing these figures with those obtained by the analysis of Nílgiri soils, it is observed that, with regard to the mineral matter, there is a full proportion and there is a fair amount of lime, phosphoric acid and alkalies (potash and soda). The soluble salts are small and they consisted of chlorides and sulphates of the alkalies and alkaline earths. The chief feature in the chemical composition of the soils is the small amount of organic material and the consequently small quantity of nitrogen present. In soils, which I have analysed from the Nílgiris, Gúdalúr and other places acknowledged to be good for the cultivation of cinchonas, more than double the amount of organic matter and combined water is usually met with. As the greater part of the samples was made up of rocks in a state of incipient decomposition, this will account for the absence of much nitrogenous and carbonaceous substances and the high proportion of silicates and sandy matter.

ORDER—dated 28th May 1890, No. 371, Revenu

Miscellaneous.

[illegible]rded, with the remark, that His Exc[illegible]y the Governor in Council has read [illegible] Lawson's report with much inter[illegible]

(True Extract.)

(Signed) C. A. GALTON,
Secretary to Government.

To the Government Botanist.
„ the Honorary Secretary, Wynaad Planters' Assoc[illegible].
„ the Board of Revenue (Land Revenue).
„ the Board of Revenue (Land Records, Settlement [illegible]griculture).
„ the Editors' table.

Exd. A. D. Xavier.

85 Copies.

Original

Govt. of {1890} Madras

REVENUE.

Issued

Recd.

G.O., 28th May 1890, No. 371

MAY.

Cinchona mortality in the Wynaad

Mr. Lawson's report on the — recorded, with the remark, that the Government has read it with much interest.

Report on the Cinchona Mortality in the Wynaad

The disease, which is causing so much havoc on many of the Cinchona Estates in the Wynaad, may be briefly described, as follows:—

1st. Up to the fourth or fifth year, after planting, the young trees have a healthy appearance; whole plantations presenting a bright green colour, which indicates that the plants are, up to this age, perfectly sound. After this period, some of the trees in the field begin to flower and to produce seed profusely; the leaves too turn a ruby red in the dry season. This early flowering, and printing, and change of colour in the leaves indicates that the tree is beginning to become unhealthy. In another year, many more of the trees go off in the same manner, till at last the whole plantation may be so affected, and ultimately perish. The symptoms of approaching death are as follows:—

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3/4/97

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N. A. Lawson

Director's office
Ootacamund 13th May 1890

Govt Botanist and Director

Cotacamund 4/15/
April 8th 1890.

From

The Government Chinologist

To

The Government Botanist and Director
Government Cinchona Plantations
Nilgiris.

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3
Rw. 350/90

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I have the honor to be,
Sir
Your obedient servant.
J. Hooper
Govt Chemist

Rec. 5/5/90

No. 7

119

Director's Office,

Ootacamund, 13th May 1890.

From

M. A. LAWSON, Esq.,

Government Botanist and Director of

Government Cinchona Plantations, &c.,

Nilgiris.

To

The Secretary to Government

Revenue Department

Ootacamund

Sir,

With reference to G. O. No 102 — dated the 3 February 1890 — Revenue — I have the honor to forward a copy of my report on the Cinchona mortality in the Wynad.

2 Copies have been already forwarded to the Wynaad Planters association.

I have the honor to be,

Sir,

Your most obedient servant,

M. A. Lawson

Government Botanist and Director.

A.

G. O. 3-2-90, No 10-(2)

Revenue Department

REVENUE {1890} CINCHONA.

No 3507.

From

M. A. LAWSON, Esq.,

Government Botanist and Director of

Government Cinchona Plantations,

Nilgiris.

To The Secretary to Government

Revenue Department

Ootacamund

No. 7

Dated 13
Despd. 13 } May 1890.
Recd. 15

15 MAY 90
SECRETARIAT REVENUE DEPARTMENT

Enclosures 2

Subject.

Cinchona Mortality in the Wynaad

Forwarding his Report on the — and requesting that Copies have been already forwarded to the Wynaad Planters Association

Rec. 17/5
Rd 21/5

Sent 15/5/90
S.K. 15/5

Revenue Department.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read Cus. 3507/90.

Issue:

C

M S
23/5/90

M C
24 May

Order 2/28 May 1890, no: 371

Recorded, with the remark that H.E. the Gov. C. has read Mr. Lawson's report with much interest.

Rem
16.5.90.

CL

To the Gov. Botanist. 16/5

— Sec. Wynaad Planters' Assoc.

— Board of Rev. (Rev).

— " (Rev. Sch. & Agric.)

" Editor's Table

85/5

Note submitted that this may be printed and placed on the Editor's Table

CL Rem
16/5

If correct
CL

Draft G.O.

W. Lawson's Report
on the Caledonia
Mental Hospital

The Hon. Col. Secretary. C&C
The Hon. Col. Sec. Colonies. C&C
H.E. the Governor

Print Soon
28-5-90

Qa 17/5
1.15.