

SOME PLANTS TO PROMOTE AFFORESTATION AND THEIR MULTIPLE USES

A. Jagadeesh
Society of Science for the People
2/210 Nawabpet, Nellore 524 002
Andhra Pradesh, India

ABSTRACT

In this paper multiple uses of plants like Agave (Americana), Seethaphal (Annona Squamosa), Phyllanthus Emblica, some minor oil seeds are presented. It is felt that by growing the above plants in vacant lands it will bring rural prosperity besides promoting Afforestation.

1. INTRODUCTION

The United Nations Conference on Desertification (UNCOD) held at Nairobi in September, 1977 proposed the plan of action designed to link national schemes to "re-green" deserts throughout the world. It was initiated in 1978 and is expected to be implemented by the end of the century.

In fact Reafforestation will bring rewards. Among many impressive examples, one of the most striking is in Saudi Arabia where the highly fertile El Ahsaa Oasis, watered-from underground aquifers, was threatened by sand dunes. Since 1962, 10 million tamarisk, accacia and eucalyptus trees have been planted on 500 hectares. Encroachment has been checked and 14 villages have been saved from the dunes.

As a follow up action to the proposal of UNCOD, I have drawn a scheme of "AFFORESTATION".

There are millions of hectares of waste land. Can't something useful be exploited from this? The forest area compared to the total area in square Km. state wise is given below.

There are many trees which grow very wildly even without water. To name a few, we have "Annona Squamosa (Seethaphal), Agave (Americana). The fruit of Annona Squamosa contains many seeds. The NSS Volunteers in colleges and University can spray seeds of "Annona Squamosa" in Government Vacant Lands during monsoon.

State	Total area in Sq.Km.	Forest area percentage
Andhra Pradesh	2,76,814	22.5%
Assam	73,538	21.7%
Bihar	1,73,876	17.0%
Gujarat	1,95,984	9.0%
Haryana	44,222	3.4%
Himachal Pradesh	55,673	38.3%
Karnataka	1,91,773	16.0%
Kerala	38,864	24.0%
Madhya Pradesh	4,42,841	17.56%
Nagaland	16,527	17.30%
Orissa	1,55,782	43.0%
Rajasthan	3,42,214	10.6%
Punjab	50,362	4.2%
Tamilnadu	1,30,069	17.0%
Uttar Pradesh	2,94,413	8.6%
West Bengal	87,853	13.4%
Goa, Daman & Diu	3,813	28.6%
Mizoram	21,087	20.0%

The seed of the fruit yield 21 to 29% oil. The characteristics of the oil are:-

Sp.Gr.at 15°C	0.92116
N 60°D	1.4558
Saponification value	181 to 183.3
Iodine number	85.6 to 88.2
R.M.Value	0.6
Poplenske value	0.2
Unsaponification matter	0.2%

The oil contains the following percentages of acids.

Oleic	18.1
Linoleic	55.1
Palmitic	14.7
Stearic	10.7
Cerotic	00.9

These acids are used in the preparation of:

Oleic acid:- Soap base, manufacture of oleates, ointments, cosmetics, polishing compound, Lubricants, Ore floatation, Organic synthetic intermediate, surface coatings.

Linoleic acid:- Soaps, special driers, for protective coating, emulsifying agents, medicine, foods, feeds, biochemical research.

Palmitic Acid:- Starting point in the manufacture of various matallic palmitates, soaps, lube oils, water proofing.

Stearic acid:- Chemicals, especially stearates and stearic driers, lubricants, soaps, candles, pharmaceuticals and cosmetics, rubber compounding, shoe and metal polishes, coatings, food packaging.

The oil in general is used in the manufacture of paints.

2. DEMAND FOR EDIBLE OILS

In normal years, the per capita availability of edible oil in the country averages 3.5 Kg. and about 1 Kg. of Vanaspati, as against 25 to 30 Kg. in Western countries. The total requirement of vegetable oils in the country, as of today, is estimated at 40 lakh tonnes, compared to the present availability of 30 lakh tonnes. There is thus a gap of 10 lakh tonnes.

It is estimated that by 1983-1984, the demand would go up to 55 lakh tonnes, while the availability would be around 35 lakh tonnes. The gap would, therefore, widen to 20 lakh tonnes. The reasons for this are not far to seek. The acreage available for oil seeds cultivation would further diminish due to a corresponding increase in the cultivation of rice and wheat, on the one hand, and the faster increase in population on the other. The situation is, therefore, quite alarming.

If this shortfall has to be met by imports, it would mean a foreign exchange drainage of about Rs.1,000 crores a year as of now, and about Rs.2,000 crores by 1983-1984. We can't afford it at any rate. And, hence need for an alternative. It lies in tapping the entire tree and forest origin seeds-generally known as minor oilseeds - which are now going a waste.

3. VARIETIES OF MINOR OIL SEEDS

In the entire forest belt of Assam, Nagaland, Manipur, Tripura, Arunachal Pradesh, border of Nepal, Bihar and West Bengal, M.P., Orissa, U.P. and some parts of Maharashtra and Karnataka, hundreds of tree and forest-based oil seeds are abundantly available.

Some of them are, salseed, mango kernel, neem seed, babul, mahua, kokum, plam, date, nahor, undi, pisa, karanja, kusum seed, jack-fruit seed, bobbie, maroti, eurahonne, mahera, rubber seed, ratanjot, tamarind seed, kamala, dhupa, tea seed, jute seed, tobacco seed, khakan etc. - by no means an exhaustive list.

Though the potential of minor oilseeds in different forest belts of India is immeasurable, a modest estimate can, however, be made as follows:

Salseed: The total potential of sal seed, particularly in Orissa, M.P., U.P., Bihar and West Bengal, is estimated around 60 lakh tonnes a year. Its collection started as late as 1967 on a very modest scale, and although the collection has increased, it is still 1.2 lakh tonnes a year, hardly 1/60th of the total availability.

Neem Seed: Its potential is also quite high, since it is available all over the country. A modest estimate puts it at around 20 lakh tonnes, but very little is being collected now, hardly 1 lakh tonnes.

Mango Kernel: The other important minor oilseed is mango kernel and its total potential is about 20 lakh tonnes a year, but, its collection throughout the country now is hardly 10,000 tonnes a year.

Other Minor Oilseeds: Other minor oil seeds which would include mahua (one million tonnes), kusum (2 lakh tonnes), Khakan (2 lakh tonnes), Karanja (5 lakh tonnes), Kokum, Babul, undi, dhupa etc., would have a total potential of about 10 million tonnes a year.

Thus the total potential of minor oil seeds all over the country can be safely estimated at 2 crore tonnes.

4. AGAVE (AMERICANA)

The 'AGAVE' plants are known for their succulent leaves and hard long fibres, which are comparable to Manila Hemp. The original plants were Mexican in origin and lately widely occurring in India also on the railway track and village borders. There are 3 species which grow in India.

AGAVE (Americana) was known to produce juice which was drunk in Mexico. A distilled spirit known as Mescal was produced. The fibrous material of the plant consists of 73 to 78% LIGNIFIED CELLULOSE. The dried residue left over after extraction of fibres contains about 10% fermentable sugars.

This plant grows wildly under a variety of environmental conditions without water. Local people extract fibre by putting the plant in mud for a month and hammering it on a stone to remove the pulp. Ropes which are smooth and strong are manufactured from this fibre. The plant when put in water for longer times produces a very bad smell. This led me to think of using it to produce biogas in go-bar gas plants.

Since the plant has Cellulose, can we use it in paper manufacture? If this is possible, the plant can be grown in lakhs of hectares of waste land.

5. PHELLANTHUS EMBLICA (AMLA)

It is being discovered that Vitamin C, which plays a

major role in the human body's immunity mechanism, can help fight cancer.

American cancer clinics recently established that patients treated with Vitamin C showed a better blood picture and according to a German weekly, this was borne out by initial cautious experiments in a British hospital some six years ago.

Some 100 cancer patients in a late stage of the disease were given five and later 10 grams. of Ascorbic acid per day and the general impression was that their physical and mental well-being was greatly improved and they needed considerably fewer pain-killers.

The report said that maximum dosage of Vitamin C that should have the greatest effect on the course of the illness is unfortunately still not known.

But excess dosage cannot harm the patient and there have been no ill-effects from dosage upto 50 grams. a day injected intravenously, the report clarified.

Doctors and researchers seem to agree that this simple treatment can prevent or 'greatly delay' a recurrence of the tumour. This might mean that medicine has entered a new stage in its fight against cancer.

At present we have synthetic Vitamin C tablets like Redoxine, Chewsee and Drops like Cecon. But nature provides fruits which are rich in Vitamin C. We have 'Phyllanthus Emblica (Amla) whose chemical analysis revealed:

Moisture	81.8%	Phosphorus	20mg/100g.
Protein	0.5%	Iron	1.2 "
Fat	0.1%	Carotene	9 µg "
Minerals	0.5%	Thiamine	0.03 "
Fibre	3.4%	Riboflavin	0.01 "
Carbohydrates	13.7%	Niacin	0.2 "
Energy	58K.Ca.	Vitamin C	600 "
Calcium	50mg/100g.		

From the above analysis it is clear, most valuable nutrient factor in amla is vitamin C or ascorbic acid. Vitamin C content up to 720 mg/100g. of fresh pulp and 921 mg/100ml. of fresh juice has been recorded. The fruit is also a rich source of pectin. A tannin, containing gallic acid, ellagic acid and glucose in its molecule and naturally present in the fruit, prevents or retards oxidation of the vitamin.

Recently some medical firms manufactured Garlic pearls made from natural Garlic. These are very popular. In the same way we can also manufacture natural vitamin C tablets and drops.

For this we need sufficient quantity of raw phyllanthus Emblica fruits. As the plant grows wildely even without water, NSS Volunteers in Universities and Colleges can undertake, the project of growing these trees in Government vacant lands. International agencies like FAO, UNESCO can undertake this project in developing countries through their branch organisations.

CONCLUSIONS

In view of the multiple uses of various plants described above it is felt that various organisations connected with aforestation programmes include these plants in the on going projects.

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