The Industrialization of Neem Plantation in Yunnan Province
------our Experiences
Yunnan Guangming Neem Industry Development Co, Ltd

Abstract:
The history, advantages and realistic significance of Neem plantation in Yunnan Province
Experiences of implement of the industrialization of Neem plantation by Yunnan Guangming Neem Industry Development Co, Ltd.

Keywords: Yunnan, Neem, plantation, industrialization, experiences
Content

1 Introduction of Azadirachta Indica

2 The History, Advantage and Significance of Neem Planting in Yunnan
   2.1 The Development Course of Neem Plantation in Yunnan
   2.2 The Advantaged Factors to Develop Neem Plantation in Yunnan
   2.3 The Realistic Significance to Develop Neem Plantation in Yunnan
3 The Industrialization of Neem Plantation ----our Experiences
3.1 Brief Introduction of our Company
3.2 Our Experiences on how to Improve the Industrialization of Neem Plantation

4 Conclusions:
1 Introduction of Azadirachta Indica

Azadirachta indica, a member of the Meliaceae family, is a botanical cousin of mahogany. It is a plant native to south Asia and Southeast Asia, which grows well in the hot river valley areas, while not native in China. Azadirachta is regarded as “the wonder free”, and its extracts have a powerful pesticide activity and are used as raw materials of pesticide, medicine and commodity. Recently Westerners have shown considerable interest in this wonderful tree. National Research Council (NRC), Washington, USA, has released a report with title as "Neem: Tree for Solving Global Problems.” The NRC Panel considers the Neem to be “one of the most promising of all plants and the fact that it may eventually benefit every person on this planet. Probably no other plant yields as many strange and varied products or has as many exploitable by-products."

According to many researches, Azadirachtin which is extracted from the Neem seeds has excellent impact on blocking the insect's production and releasing of these vital hormones. Insects then will not molt, thus breaking their life cycle. Besides, Azadirachtin plays a wonderful role on controlling or killing various wireworms and epiphytes. The industrialization of neem is great profitable ecologically, socially and economically.
2 The History, Advantage and Significance of Neem Planting in Yunnan

2.1 The History of Neem Plantation in Yunnan

- In 1995, the researcher Lai Yongqi etc. of Chinese Academy of Forestry introduced the Neem in India to the acid and hot river valley areas in Yunnan and the Neem grows well there. That research group has introduced the Neem from South Asia, Southeast Asia and Africa to China since 1997. This research program let us know where the Neem grows well in China and what breeds of Neem is adapted to the weather in China. At the same time, they also began the research of Neem cultivating and breeding.

- In 1998, the demonstration of industrial neem planting was started out in China. Because of the advantages on climate and terrain, the neem planting was popularized and promoted in Yunnan rapidly. During the year, there were only 20 hectares of neems planted in Yunnan, but in 1999, the plantation grew to 350 hectares. In 2000, the plantation almost doubled and increased to 680 hectares. Till the end of 2005, the plantation even reached 3000 hectares. Yunnan has had the largest area of sheer neem plantation around the world.

- Chinese Academy of Forestry plays an important role in cultivating technology of Neem. This institution has finished lots of researches on the methods of Neem breeding and acquired abundant experiences and many achievements.
2.2 The Advantages to Develop Neem Plantation in Yunnan

2.2.1 the Adequate Climate and Terrain

According to the experiments of the Insects Institute of Chinese Academy of Forestry, the parameters of climate that good for neems growing are below: Average Temperature of Year ≥ 20°C; Coldest Average Temperature of Month ≥ 12°C; Extreme Lowest Temperature of Year > 0°C; Frost Days of Year ≤ 2 days. So, the best area for neems planting are valley of Hong river, valley of Jinsha river, valley of Nu river, valley of Lancang river, valley of Nanding river and valley of Ruili river in Yunnan province; Hainan province and the peninsular Lei in Guangdong province. Most of these areas are in Yunnan province.
2.2.3 Competitive Enterprises and Advanced Technology

- There are an army of leading enterprises engaged in the industry of Neem and technologies involving in Neem products developed in Yunnan.

- Nowadays, the enterprises which are engaged in Neem products are mainly located in Yunnan, such as Yunnan Guangming Neem Industry Development Co, Ltd, Yunnan Zhongke Biological Industry Co, Ltd, and Yunnan Jianyuan Biology Development Co, Ltd and so on. Yunnan Guangming Neem Industry Development Co, Ltd is one of the companies which do the research and invention of Neem products early in China. Two products invented by this company has gained National Patent. Furthermore, this company owns a 50,000 mus raw-material forested base of Neem and a ecological pesticide factory.
2.2.4 Support from Governments and Organizations

- Government supports the development of industrialization of Neem plantation in Yunnan. Ministry of Science and Technology, NDRC, Ministry of Commercial and National Forestry Department, as well as their branches in Yunnan Province issued many supporting policies in order to help the enterprises and research institutions involved in Neem products. Some programs of Neem are also in the lists of National Torch Plan, National Star Fire Plan and National commercialization of agriculture research findings funds. Besides, local governments try their best to put the Grain for Green Project into effect in order to support the development of Neem plantation.

- UNIDO also pay attention on the development of Neem industry in Yunnan Province. We are sure that the International Neem Conference organized by UNIDO will play a significant role in promoting the development of Neem Industry.
2.3 The Significance to Develop Neem Plantation in Yunnan

2.3.1 The Environmental, Social and Economical Benefits of Neem Plantation

- Developing Neem plantation in Yunnan Province would bring us significant ecological benefits, social benefits and economic benefits:

- The ecological environment in acid and hot river valley areas is apt to get damaged. At the same time, it is also hard to prevent deforestation and conserve the environment in these areas. That threatens the life and property of residents and restricts the development of local economy.

- Neem plantation would have good ecological benefits. Neem is an evergreen, tall, fast-growing tree, which can reach a height of 25m and 2.5m in girth. It has an attractive crown of deep green foliage and masses of honey scented flowers. Such a tree is a native
reservoir which is helpful to conserve the water in earth, improve the air condition and make the local environment better.

Neem is easy to plant and management. We can extract oil from Neem seeds, use Neem leaves to feed livestock. Besides, the wood of Neem is worm proof and hard to get decayed. Residents in acid and hot river valley area can sell Neem seeds to the enterprises which are engaged in Neem products. That boosts the development of local economy definitely.

Therefore, planting Neem is a key measure to refresh the local ecological environment and make people richer. The industrialization of Neem plantation is a significant program which is full of social, economic and ecological benefits.
2.3.2 The Important Role of Neem Plantation Plays in the Industrial Chain of Neem

- Neem plantation plays a basic and promoting role in the industrial chain of

  - Development of Neem plantation
  - Boosting Development of Neem manufacturing
  - Improving Influencing Development of national agriculture and medicine industry

At present, the enterprises which engaged to manufacture Neem products are used to importing raw material from India and Burma.
Because India government controls the import of Neem seeds rigidly, the semi-finished material-imported from India is too expensive and its price is up to 1200 USD per kg. On the other hand, the importing channel from Burma isn’t smooth enough, which leads to higher price of the Neem seeds from Burma. All of these above result in the higher cost of Neem products, heavier burdens of Neem products’ users and lower competitive ability of pesticide products of Neem.

The industrial chain of Neem manufacturing is relatively long and involved in many industries such as medicine manufacture, commodity manufacture, and pesticide manufacture and so on. Our province has most of the industries mentioned above. Those industries have potential to cooperate with Neem industry closely and become new type industries with good profit. That is also helpful to handle with the problem of employment in these enterprises.
3 The Industrialization of Neem Plantation ------ our Experiences

3.1 Brief Introduction of our Company

- Yunnan Guangming Neem Industry Development Co, Ltd is the subsidiary company of Yunnan Guangming Co, Ltd (SH600239). This company is a high-tech enterprise engaged in establishing the Neem bases and making Neem plantation industrialized. It also executes the key program of National Star fire Project and becomes the enterprise chartered by NDRC to produce pesticide. Our company is founded in July, 2000.

- Today, our company establishes an ecological factory to produce pesticide in Mangshi, Luxi, Dehong. And our Neem products are very popular in Zhejiang, Shandong and Guangdong province as well as the countries and areas in Southeast Asia.
3.2 Our Experiences on how to Improve the Industrialization of Neem Plantation

3.2.1 Operating Mode

- The operating mode of our company to make Neem plantation industrialized is the kind of “company+base+farmer”. Besides, our company cooperates with local government in order to keep our forest management efficient and rational. Particularly speaking, we make contract with farmers who participate in the Grain for Green Project and let them manage the forested areas. At the same time, the local government organizes special team to manage forested areas in barren.

- In order to make sure the operating mode of “company+base+farmer” done well, our company follows the rules of “original land owners first as well as nearest”, and establishes the forested bases orderly. According to the contract between farmers and us, contracted farmers should take all the responsibility of the whole planting process, which encourages them to do their best to cultivate and manage the forested areas effectively.

- Our company will have pay contracted farmers for picking fee only but not the fee of managing since 2007.
3.2.2 Introduction of our Raw-material Forested Bases

The raw-material forested bases of our company are mainly established in county Yuan yang, 2003~2004. Furthermore, we did some replanting on the land where the saplings didn’t survive. So, our forested raw-material red areas become a whole system which is located in the river valley, south bank of Red river. According to the investigation in Feb. 2006, the whole system was 33666 mus, and the total amount of the trees was up to 940459.

3.2.3 The Technologies of Forestation
3.2.3.1 Preparing the Land for Cultivating the Forest of Raw Materials through Loosening, Turning over or Removing Earth and Digging Planting Channels.

This process can increase the capability of earth to contain water and help the saplings apt to survive. It must be finished during the period between Oct., the year before foresting and March, the foresting year. And we should dig planting channels in the flat area or gentle slope whose gradient is smaller than 15°. If the gradient of slope is bigger than 15°, we should dig planting pools but not planting channels in order to conserve the earth. the saplings.
3.2.3.2 Filling the Planting Channels with the Insolated Earth.

- The earth is the one loosened, turned over and removed in process 1. In order to make that earth fertile, we should expose it to sunlight for 2 or 3 months. After that, we could fill the planting channels with the insolated earth. And when the rainy season comes, it is ready for us to plant the saplings.

3.2.3.3 Bringing up Saplings with Alimentation bags in Cultivated Area.

- Neem has a strong taproot and lots of side roots which form a whole root system. It doesn’t rain regularly in the drought river valley area. Therefore we should use alimentation bags when planting in order to keep saplings survive.
3.2.3.4 Planting the Feasible Saplings in Prepared Planting Channels at right time.

- The best time for planting saplings is a rainy day when the rain can make the earth under the ground 30 cms wetted, during the period between 20th June and 10th July. On one hand, this measure can make the saplings apt to take root and absorb nutrient rapidly. On the other hand, it is helpful for the plant to do photosynthesis and grow healthy.

3.2.3.5 Some Special Measures on how to Increase the Surviving Rate of Neem Saplings.

- Because it doesn’t rain much and regularly, we should plant one-year-old saplings which are stronger enough that its height is up to 70 cm. In order to maintain the high surviving rate of Neem saplings in droughty and rainless environment, we’d better cut trunks out when planting the saplings.
3.2.3.6 Fostering Management

- After Neem is planted, there is no need to irrigate. However, we should do some upbringing in the early of Nov. the same year and do another in the later of May, next year. The upbringings above can decrease the disadvantage impacts of pests and increase the earth’s capability to contain water. Besides, we should cut out deadwood and caught tresses and destroyed them by burning or melting.

3.2.3.7 Management after Planting Feasible Saplings(evening management)

- We should put the system of multi-level contracting in practice. Particularly speaking, we could build up houses for guarding the forest in advance and arrange some safeguards to keep the forest well.
- The management contents are below: weeding in order to avoid fire, patrolling in order to avoid livestock and persons destroy the forest, and fertilizing at right time.
4 Conclusions:

Azadirachta indica is native to India, Burma and Africa. China takes the lead in the Industrialization of Neem Plantation in the world by itself. Luckily, we accumulate many tips and gain more precious experiences on the industrial chain of Neem plantation through decades of exploring and practicing. Under the supports of government institutions and enterprises as well as the participation of our villagers, there is over 400,000 mus Neem in Yunnan province. That makes Yunnan the biggest artificial area of Neem planting globally and the raw material center of Neem products in china. As a leading enterprise of Neem industry in Yunnan, our company would try our best to improve the development of this industry and cooperate with parties all over the world.
Thank you