Melia dubia as a potential species for agroforestry in diverse climatic and geographical conditions of Haryana, India
Haryana on the map of India
Haryana State at a Glance

- Geographical Area: 44,21,200 ha
- >80 percent area under agriculture
- Rainfall: 217mm to 1,097mm.
- 65% of the area is semi-arid climate.
- Drought is a recurring feature.
- Forest Area: 3.9% of the total geographical area.
- By and large Haryana is forest deficient state.
Natural Forests

These natural forests are limited

The Aravallis

The Siwaliks
Agroforestry is the only option for improving envt. and Meeting wood requirement.

Eucalyptus – Trifolium alexandrinum
Poplar is very popular with farmers but it has limited zone.
Eucalyptus has brought prosperity to the farmers of Haryana but is disliked by environmentalists. It needs lot of water and does not grow in drier parts of the state.
Eucalyptus- Wheat
Agroforestry in Central Plains of Haryana
Melia dubia - An Introduction
Syn: Melia composites
English Name: Persian Lilac, White Cedar
Family: Meliaceae
Native of India
Botanical Description:
- Deciduous
- Height up to 25m.
- Leaves: Alternate, 20-40 cm long, bipinnate or occasionally tripinnate.
- Leaflets 3-11, with serrate edges.
- Flowers: Showy, fragrant, numerous on slender stalks, white to lilac.
- Time of Flowering: March-April.
- Fruit: A small, yellow drupe, nearly round, about 15 mm in length.
- Seed: Oblongoid 3.5 mm x 1.6 mm.
  - No. of seeds per fruit: 4 to 5
  - Time of seed ripening: Dec. to Feb.
  - Seed viability: 1 to 3 years
Current Uses
- Provides excellent shade during summer.
- Is leafless during winters, so does not hinder sunlight.
  - An excellent ornamental tree.
- Flowers are scented and are good honey bee flora.
  - Helps in pollination by harbouring bees.
- Compatible with all crops.
- Wood free from the attack of Post Flour Beetles.
  - Fruit stones are used in making necklaces and rosaries.
  - Wood is good for agricultural implements, furniture, plywood, boxes, poles, tool handles.
  - Wood is termite resistant.
- Medium quality fuelwood.
A versatile tree with wide adaptability.
Fast growing.
Mass multiplication perfected.
Fast growing.
Condensed nursery time.

Forester Friendly
People Friendly Environmentalist Friendly
Researcher’s Delight
Forester Friendly: 20 percent of Punjab Plantation Is *Melia dubia*
Fine Grains: Good Looking

Termite Resistant
The White Cedar

Good For Carving
Carpenter Friendly: Good Nail/Screw Holding

Carpenter Friendly: Furniture, Doors (away from water). Cupboards Partitions.
Carpenter friendly
Good joints
(Large only)
Carpenter Friendly: Turns Well
Tested Under Actual Use
Teak (Tectona grandis) Vs. Melia dubia

5 seater: 15,000 rupees
5 seater: 8000 rupees
Replacing Eucalyptus And Poplar
Compatible with all crops
Suitable for strip plantations
Farmer Friendly: Frost & Drought Resistant
Environmentalist’s choice for instant greening

One year old Melia
Growing *Melia dubia*

**Seed Collection:** Jan/Feb

Direct Sowing in polybags containing a mixture of FYM, silt & clay.

Extraction of seeds by mechanical breaking.

Then sowing in polybags.

**Raising by stumps**

Sowing of whole fruit on ground on raised beds in Feb/March.

Preparation of stumps during next February in containers of size 40 cmsx60 cms.

Plants will be ready for planting by July.
Site Preparation & Planting:

• Ploughing in the case of agroforestry in the month of April-May after harvest of previous crop.
• Digging of pits of size 60cmx60cmx60cm in the month of Feb.
• Addition of 5 Kg FYM/2Kg vermicompost in first week of July.
  • Addition of 20 gm of DAP (Diamonium Phosphate) at the time of planting during second week of July.
• Manual weeding and hoeing in August, September, October & Feb.
• Pruning of branches in Nov/Dec.
Maintenance & Harvesting

(With Agriculture Crop)
Second Year: Manual weeding in August & February.
3rd year onward:
Pruning in Nov. every year.
Ploughing and watering
as per requirement of agriculture crop.
No extra inputs after second year.

(Block Plantation without crop)
Weeding in August & February.
Pruning in Nov. every year.
Agroforestry Studies In Haryana

Panchkula
Location: Shiwalik Foothills
Altitude: 400m
Temperature
Max.- 43
Min.-1 degree C
Rainfall: 1000mm

Jhumpa
Location: Semi arid region
Altitude: 300m
Temperature
Max.- 47
Min: Negative 2degree C
Rainfall: 250mm
4 year Old *M. dubia* block Plantation
## Yield of wheat

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Year of Plantation</th>
<th>Yield of Wheat (In Qtls)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2007-2008</td>
<td>19.8</td>
</tr>
<tr>
<td>2</td>
<td>2008-2009</td>
<td>15.5</td>
</tr>
<tr>
<td>3</td>
<td>2009-2010</td>
<td>12.00</td>
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Jhumpa
Studies at Jhumpa are being conducted with three species: *Emblica officinalis* (Indian Gooseberry), *Tecomella undulata* & *Melia dubia*. Indian Gooseberry is frost tender. *T. undulata* is too slow.
Indian Gooseberry is good, but it is frost tender
Growing *Vigna mungo* with three year old *M. dubia*

Jhumpa
Per Hec. cost of cultivation of *V. mungo*

*At Jhumpa*

*Cost of seed*=Rs. 2772
Cost of ploughing= Rs. 6372
Weeding= Rs. 14400
Insecticide= Rs. 1972
Harvesting & thrashing= Rs. 13700
Total= 40416

**Returns**

Income from husk=Rs. 6500
Income from pulse=Rs. 71272
Total=Rs. 77772
Net Profit:=Rs. 38556

Returns from control (Without trees)
=Rs. 39000

*Not a significant difference*
Harvesing of *Melia* trees at Panchkula will be done in 2015. In Jhumpa in 2017 Final wood yield figures will be known upon harvesting.
<table>
<thead>
<tr>
<th>Species</th>
<th>Rate (Rs per cubic metre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eucalyptus</td>
<td>5000</td>
</tr>
<tr>
<td>Poplar</td>
<td>4500</td>
</tr>
<tr>
<td><em>Melia dubia</em></td>
<td>4000</td>
</tr>
</tbody>
</table>

Owing to wider adaptability of *M. dubia* the rates are comparable.
Progeny Trial:

• 20 feet height in two years.
• Straight bole free from any defect.
• Frost & drought tolerant.
  ▪ Plan to hybridise.
The Limitations

Shallow Root System
Thank You