Production Technology of Seed Spices

- Fennel
- Coriander
- Fenugreek
- Cumin

BY
Mrs. KALYANI PRADHAN
ASST. PROFESSOR
MSSSoA
CORIANDER

Coriandrum sativum L. Apiaceae
Varieties

CO 1
CO 2
CO 3
CS 287
Karan
CIMOPO S 33
CS 2
CO (CR) 4
GAU 1
UD 1
UD 2
UD 20
UD 21
**Description**

**Co.1**
- Superior variety of germplasm selection (TNAU)
- Dual purpose, 110 days, Tolerant to grain mould
- Seed yield of 800 kg/ha (rainfed conditions) and 2000 kg/ha (irrigated conditions)

**Co.2**
- Reselection from the type P2 of Gujarat
- High yielding dual purpose variety, tolerant to drought
- 90-100 days, yield (600-700 kg/ha)

**Co.3**
- Pure line selection from Acc. No. 695, IARI
- Dual purpose, less susceptible to wilt and grain mould
- Duration is 90 days, yields (650-700 kg/ha)
CS 287
- Recurrent selection from CS.6
- Small, bold grain, tolerant to wilt and grain mould, suit for rainfed tracts

Karan
- Developed through recurrent selection, based on progeny testing
- Small seeded, highly resistant against wilt and stem gall disease (Sharma and Bhatti, 1986)

CIMPOS-33
- An improved strain developed by intensive selection from Bulgarian material

CS.2
- Selection from the germplasm collection Warangal
- Medium to tall, more branching, bushy type with 83 cm height
- Yield of 1,350 kg/ha
<table>
<thead>
<tr>
<th>Soil</th>
<th>Climate</th>
</tr>
</thead>
</table>
| •Well drained silt or loamy soils are suited for cultivation.  
•For rainfed cultivation soil should be clay in nature and the pH should be 6 – 8.  
•Coriander performs well at a temperature range of 20 – 25 °C. | Cool and comparatively dry, frost free climate   |
Sowing time: June – July (Kharif)  
September – October (Rabi)

Spacing: 20 x 15 cm or 15 x 15 cm

Fertilizers and manures:
10-15 tonnes of FYM + 30:40:20 kg NPK/ha  
(3 splits for Rabi)
• **Seed rate**: 10-12 kg/ha (irrigated) 
  20 kg/ha (rainfed)

• **Seed treatment**:
  ✓ Splitting of seeds into two halves.
  ✓ Treated with Agrosan GN or Thiram @ 2g/kg of seed and *Trichoderma* @ 4-6g/kg seed.
• Sowing method:
  ◦ Broadcasting
  ◦ Line sowing

- Soaking the seeds in water for 8-12 hours before sowing hastens germination.
- Seed depth should not exceed 2.5 cm
• **Manures and Fertilizers:**
  1/3\textsuperscript{rd} of N and full dose of P & K should be applied as basal dose.
  Remaining 2/3\textsuperscript{rd} should be applied in two equal splits (Top dressing – 30 and 60 DAS)

• **Irrigation:**
  First irrigation immediately after sowing and the second on the third day. Subsequent irrigation at 7-10 days interval.
Crop rotation:
Maize – Potato – Coriander
Summer moong – Bajra – Coriander
Rice – Coriander – Summer moong/fallow
G.gram/B.gram – Coriander – Okra
Cowpea – Coriander – Okra
Cluster bean – Coriander – Summer maize
- **Harvesting:**
  - 100-150 DAS (seed purpose)
  - 30-45 DAS (green leaves)
- **Yield:**
  - 4.5 to 6.0 q/ha - rainfed
  - 8 to 12 q/ha (seed) + 5 - 7 q/ha (leaf) – irri.
  - Leaf alone 50 - 80 q/ha with 3-4 cuttings
  - Improved varieties 27 q/ha of seed.
FENUGREEK

Trigonella foenum graecum L.
Trigonella coriculata L.
## Varieties

<table>
<thead>
<tr>
<th>Variety</th>
<th>Parentage</th>
<th>Institution</th>
<th>Salient features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lam selection 1</td>
<td>selection from germplasm</td>
<td>ANGRAU, AP</td>
<td>tolerant to powdery mildew, root rot, caterpillars and aphids</td>
</tr>
<tr>
<td>Pusa Early Bunching</td>
<td>NA</td>
<td>IARI</td>
<td>Resistant to downy mildew, rots</td>
</tr>
<tr>
<td>Rajendra Kranti</td>
<td>Pure line selection from Reghunathpur local</td>
<td>COA, Murzhapur</td>
<td>Tolerant to leaf spot, suit for intercropping</td>
</tr>
<tr>
<td>Hissar sonali</td>
<td>Pure line selection from local</td>
<td>HAU, Haryana</td>
<td>Moderately tolerant to root rot, aphids</td>
</tr>
<tr>
<td>Co.1</td>
<td>Selection from germplasm</td>
<td>TNAU</td>
<td>dual purpose variety evolved at TNAU, Tolerant to root rot</td>
</tr>
<tr>
<td>Rmt-1</td>
<td>Pure line selection from Naguar local</td>
<td>RAU, Jobner</td>
<td>Moderately resistant to root rot and tolerant to powdery mildew</td>
</tr>
<tr>
<td>Rmt-143</td>
<td>Pure line selection from local</td>
<td>-do-</td>
<td>Seeds mature 140-150 days after sowing, Moderately resistant to powdery mildew</td>
</tr>
</tbody>
</table>
• Sowing time: June – July & Oct – Nov

• Seed rate: 12 kg/ha

• Spacing: 20 x 15 cm

• Seed treatment:
  ◦ Treated with *Azospirillum* 1.5 kg/ha + *Trichoderma viride* @ 50 g/ha for 12 kg of seeds
• Manures & Fertilizers:
  ◦ FYM 20-25 t/ha (Beds & Channels 3.5 x 1.5 m)
  ◦ 30:25:40 kg/ha

• Irrigation:
  ◦ First irrigation is given immediately after sowing, second on the third day and subsequently at 7 - 10 days intervals.
- **Harvest:**
  - 20-25 days for greens
  - 90-100 days for grains

- **Yield:**
  - Greens: 4 to 5 tonnes/ha
  - Grains: 500 to 700 kg/ha
Varieties:

CO 1
UF 32
PF 35
Gujarat Fennel 1
- **Season:**
  - Hills: May – June
  - Plains: October – November

- **Seed rate:**
  - Direct sowing: 9-12 g/ha
  - Transplanted: 3-4 g/ha (5-6 weeks)

- **Spacing:** 60 x 30 cm

- Thinning is required for direct seeded one.
• **Irrigation:**
  ◦ First irrigation should be given immediately after sowing, second on the third day and subsequent irrigations at 7 - 10 days intervals.

• **Manures & Fertilizers:**
  50:10:0 kg NPK/ha

• **Harvest:**
  ◦ The crop matures in 7 - 8 months. Harvest the umbels 4 - 5 times at 10 - 15 days intervals, dry in sun for 4 - 5 days and seeds are threshed.

• **Yield:**
  ◦ 500 - 750 kg/ha/year
Cuminum cyminum
Apiaceae
Varieties:
- S-404
- MC-43
- Gujarat Cumin-1 (GC-1)
- GC-2
- GC-3
- RS-1
- UC-198
- RZ-19
• Seed rate: 12 – 15 kg/ha

• Season: November

• Seed treatment:
  ◦ Ceresan or thiram or Difoltan @ 3.0 g per kg
  ◦ Soaking in water for 8 hrs.

• Manures & Fertilizers:
  ◦ 15-20 tonnes FYM + 30:15:0 kg NPK/ha
• Harvest:
  ◦ Period – 110 to 115 DAS
  ◦ Plants turn yellowish brown.
  ◦ Cutting / Uprooting of entire plant.

• Yield: 600 – 700 kg/ha
Pimpinella anisum
Apiaceae

Aniseed
Varieties

PF 35
UF 8
UF 31
UF 12
UF 103
RF 17
- **Seed rate**: 10 – 12 kg/ha

- **Season**: September - October

- **Planting method**:
  - Nursery (mid Aug) – transplant (45-50 DAS)
  - 

- **Manures & Fertilizers**:
  - 10 tonnes FYM + 60:60:40 kg NPK/ha
• Harvest:
  ◦ Vegetable: 40 – 50 DAS
  ◦ Seed: 185 – 210 DAS

• Yield:
  ◦ 8 – 10 quintals/ha
# Insect pests complex of seed spices

<table>
<thead>
<tr>
<th>Pest complex</th>
<th>Crop stages</th>
<th>Common insect pests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil insects</td>
<td>Seed germination to vegetative growth</td>
<td>Termite, white grubs and cut worm</td>
</tr>
<tr>
<td>Leaf minors</td>
<td>Early vegetative growth</td>
<td>Leaf minor</td>
</tr>
<tr>
<td>Sucking pests</td>
<td>Vegetative stage to fruit maturity stage</td>
<td>Aphids, white fly, mite, jassids, thrips, hoppers, seed bug etc.</td>
</tr>
<tr>
<td>Seed/fruit borer</td>
<td>Seed development stage to seed harvesting stage</td>
<td>Seed wasp</td>
</tr>
<tr>
<td>Defoliators</td>
<td>Vegetative stage to seed maturity stage</td>
<td><em>Helicoverpa armigera</em> (cotton boll worm) and <em>Spodoptera litura</em> (Tobacco cut worm)</td>
</tr>
<tr>
<td>Storage pests</td>
<td>All storage</td>
<td>Cigarette beetle and drug store beetle</td>
</tr>
</tbody>
</table>
### IMPROVED VARIETIES

<table>
<thead>
<tr>
<th>Crop</th>
<th>Variety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumin</td>
<td>RZ – 19, RZ – 209, RZ – 223, RZ-345, GC- 1, GC – 2, GC – 3, GC – 4</td>
</tr>
<tr>
<td>Coriander</td>
<td>Ajmer Coriander -1 (ACr 1), Ajmer Coriander -2 (ACr- 2), RCr – 41, RCr – 20, RCr – 435, RCr – 436, RCr – 684, RCr – 446, RCr-728, GCr – 1, GCr – 2, CO- 1, CO- 2, CO- 3, CS- 287, RajendraSwathi, Rajendra Sonia, Sadhna, Swathi (CS – 6), Sindhu, GCr – 1, GCr – 2, CO- 1</td>
</tr>
<tr>
<td>Fennel</td>
<td>Ajmer Fennel-1 (AF – 1), Ajmer Fennel-2 (AF-2), RF – 101, RF – 125, RF – 143, RF-205, PF – 35, GF – 1 (Gujarat Fennel – 1), GF – 2, GF – 11, Guj. F.-12, Co – 1, Hisar Swarup</td>
</tr>
<tr>
<td>Fenugreek</td>
<td>Ajmer Fenugreek 1, Ajmer fenugreek 2, Ajmer Fenugreek 3, Ajmer Fenugreek 4, Ajmer Fenugreek 5, RMt – 1, RMt – 143, RMt – 305, RMt-361, GM – 1, CO – 1, RajendraKranti, Andhra Pradesh, Lam Selection–1, APHU Methi-1, Hisar Sonali, Hisar Suvarna, Hisar Mukta, Hisar Madhavi (HM – 350), HM-219, Pant Ragini, Pusa Early Bunching, Pusa Kasuri</td>
</tr>
<tr>
<td>Dill (Sowa)</td>
<td>Ajmer Dill 1 (AD–1), Ajmer Dill 2 (AD–2), GD-1, GD-2, RSP-11</td>
</tr>
<tr>
<td>Ajwain</td>
<td>Ajmer Ajwain 1 (AA-1), Ajmer Ajwain 2 (AA–2), Ajmer Ajwain -93 (AA-93), Pratap Ajwain 1, GA – 1, Lam Selection–1, Lam Selection–2, Pant Ruchika, RPA-68,</td>
</tr>
<tr>
<td>Nigella</td>
<td>Ajmer Nigella 1 (AN – 1), Ajmer Nigella 20 (AN-20), Azad Kalaungi (1998), Pant Krishna (2001), RajendraShyama, Rajendra Mani</td>
</tr>
<tr>
<td>Anise</td>
<td>Ajmer Anise 1 (AAni – 1)</td>
</tr>
<tr>
<td>Celery</td>
<td>Ajmer Celery-1, RRL-85-1,</td>
</tr>
</tbody>
</table>
THANK YOU