

## Cabbage (*Brassica oleracea* L., *Capitata* group)

French: Chou; Italian: Cavolo; Spanish: Col; German: Kohl

### Under Tropical/Subtropical Conditions

#### Crop data

Biennial. Harvested part: Leafy head. Both direct seeded and transplanted. Harvested 70 - 120 days after sowing. Plant density: 28 700 to 40 000 plants per ha. Preferably grown in loamy sand, pH 6 - 6.5. Not tolerant of acid soils.

Adapted to cool (16 - 20 °C), moist climates. Generally irrigated. Target marketable yields in intensive commercial production = 20 - 30 t/ha.

#### Nutrient demand/uptake/removal

| Nutrient uptake/removal - Macronutrients (optimum fertility conditions) |       |      |     |     |     |
|---|-------|------|-----|-----|-----|
| Yield t/ha  | kg/ha |      |     |     |     |
|   | N     | P2O5 | K2O | MgO | CaO |
| 29  | 121   | 32   | 106 | 5   | 21  |
| Source: various   |       |      |     |     |     |

#### Plant analysis data

| Plant analysis data - Macronutrients (optimum fertility conditions) |              |                 |     |     |     |     |     |
|---|--------------|-----------------|-----|-----|-----|-----|-----|
| Plant part  | Growth stage | % of dry matter |     |     |     |     |     |
|   |              | N               | P   | K   | Mg  | Ca  | S   |
| Wrapper leaf  | Head         | 3.3             | 0.5 | 3.1 | 0.4 | 1.6 | 0.2 |
| Source: various   |              |                 |     |     |     |     |     |

| Plant analysis data - Micronutrients (optimum fertility conditions) |              |                |    |    |    |    |    |
|---|--------------|----------------|----|----|----|----|----|
| Plant part  | Growth stage | ppm dry matter |    |    |    |    |    |
|   |              | Fe             | Mn | Zn | Cu | B  | Mo |
| Wrapper leaf  | Head         | 19             | 10 | 9  | 5  | 17 | 2  |
| Source: various   |              |                |    |    |    |    |    |

#### Fertilizer recommendations

Cabbage is a heavy feeder on fertilizer nutrients, except P. Heads will not form unless adequate N is given. Excessive N, on the other hand, may cause loose head formation and internal decay. The demand for P is greater during head formation. K deficiency can result in marginal necrosis and lower head quality, but an excess of K can cause the heads to open. The crop has a high S requirement and is sensitive to deficiencies of Mg and B.

Fertilizer applications are split, with part applied before planting. Ploughing-under of lime and compound fertilizer before planting is recommended. Use of a high analysis starter solution containing 0.75 kg nutrients per 100 litres is recommended when transplanting. The remainder of the crop's needs can then be met with in one or two applications during the growing season.

The N-fixing bacteria *Azospirillum* spp., which are present in many tropical soils, were recently found to promote cabbage foliage growth.

## **Present fertilizer practices**

### **Brazil (Minas Gerais)**

General recommendations are, firstly, 60 kg/ha N, 120 kg/ha P<sub>2</sub>O<sub>5</sub>, and 180 kg/ha K<sub>2</sub>O incorporated in the soil at planting and, secondly, 60 kg/ha N and 60 kg/ha K<sub>2</sub>O broadcast in 3 applications 15 and 30 days after planting and during heading closure. For improved yields also incorporate 30 t/ha of organic matter into the soil two weeks or more before planting.

### **Philippines (Los Banos)**

240 kg/ha N, 60 kg/ha P<sub>2</sub>O<sub>5</sub> and 60 kg/ha K<sub>2</sub>O, all the P<sub>2</sub>O<sub>5</sub> and half the N and K<sub>2</sub>O applied in bands along the rows at planting and the remaining N and K<sub>2</sub>O sidedressed 8 - 10 cm deep one month after planting and watered immediately.

### **Senegal (Camberene)**

On light sandy soil in a semi-arid area, 20 t/ha organic matter, 65 kg/ha N, 65 kg/ha P<sub>2</sub>O<sub>5</sub>, and 100 kg/ha K<sub>2</sub>O. All the organic manure and P<sub>2</sub>O<sub>5</sub> and one-third of the N and K<sub>2</sub>O are broadcast before planting, one-third of the N and K<sub>2</sub>O is sidedressed 20 days after planting, and the remaining third of the N and K<sub>2</sub>O is sidedressed 40 days after planting.

### **India (Bangalore)**

In sandy loams with pH 6.7: 150 kg/ha N, 80 kg/ha P<sub>2</sub>O<sub>5</sub> and 40 kg/ha K<sub>2</sub>O. All the P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O and one-half of the N are applied before transplanting, and the remaining half of the N is applied 30 days after transplanting.

### **Further reading**

GUPTA, A.: Effect of N and irrigation on cabbage production. *Ind. J. Hort. Sci.* 44, 241-244 (1987)

CSIZINSKY, A.A.: Nutrition of cole crops with the full-bed polyethylene mulch system in West-Central Florida. *J. Plant Nutrition* 10, 1489-1497 (1987)