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| the  onion  CULTIVATION |
| Variety N-52 |
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| Henry Ross | Federal Government | September 9, 2023 |

# Introduction

This report documents the cultivation of onion (Allium cepa) variety N-52 under organic management. Onion is a widely grown and economically important vegetable crop; this trial evaluated a sustainable production method using organic fertilizers and integrated pest control to produce healthy bulbs. The objectives were to detail the cultivation process and assess outcomes (plant growth, bulb size, yield potential) using the provided protocols. Emphasis was placed on organic amendments (compost/FYM, biofertilizer) and non-chemical pest control, aligning with research showing that such practices can enhance soil fertility and crop quality

# Materials and Methods

A total of 250 g of seed of the N-52 onion variety was used. The seeds were soaked in clean water for 18 hours before sowing to improve germination. Three nursery beds (each 1 m wide × 3 m long) were prepared with a 1:1 soil: compost mixture. Each nursery bed was enriched with 250 g of urea, 250 g of diammonium phosphate (DAP), and 250 g of potash, providing a balanced N–P–K base. Seeds were sown in the nursery on 28 Mangsir (mid-December) at a row spacing of 5 cm and an intra-row spacing of 3 cm. The nursery was irrigated gently every day and initially mulched with rice straw to conserve moisture; the straw mulch was removed one month after sowing (by late Poush) once seedlings reached ~15–20 cm height. After about 30 days in the nursery, healthy seedlings were ready for transplant. Raised planting beds with drip irrigation lines, like those used in this trial. Eight such beds (1 m wide × 20 m long × 15 cm high) were prepared in the main field. Each bed was enriched before transplanting with 1 2 1 farmyard manure (FYM) and 1 kg each of urea, DAP, and potash. A registered biofertilizer (containing beneficial bacteria such as Azospirillum and phosphorus-solubilizing bacteria) was applied to further boost fertility. Irrigation was done on each bed to ensure uniform watering of the crop. The beds were allowed to settle before transplanting began. Cultivation details: Key inputs and spacing used are summarized as follows: variety N-52; seed rate 250 g; nursery beds 1×2 m (soil:compost 1:1; +250 g each of urea, DAP, potash per bed); transplant bed dimensions 1×20 m ×15 cm; bed amendments: FYM + 1 kg each of urea, DAP, potash per bed, plus biofertilizer. Transplant spacing in the field was 25 cm between rows and 20 cm between plants (≈4 rows per 1-m-wide bed). These management steps follow standard onion recommendations (e.g. applying FYM with NPK, maintaining raised beds, etc.) and provide the basis for the cultivation process described below.

# Cultivation Process

The cultivation proceeded through distinct stages as outlined:

Nursery Stage (Mangsir 28 – Poush 28): Pre-treated seeds were shown on the prepared nursery beds (row-to-row 5 cm, plant-to-plant 3 cm). The beds were gently irrigated daily, and a thin layer of rice straw mulch was applied to maintain moisture. By one week after sowing, most seedlings had emerged and entered the “pinhead” stage (tiny bulb visible). The mulch was kept in place for ~30 days to conserve moisture and suppress early weeds, then removed at 28 Poush when seedlings reached ~15–20 cm.

Transplanting (19 Magh): Seedlings from the nursery were transplanted into the field on 19 Magh (early February). Bed spacing was 25 cm between rows and 20 cm between plants, resulting in about four rows per bed ~200 plants per bed. The onion seedlings were transplanted by hand into the prepared raised beds. Seedlings were placed in the moist ridges of the beds at 25 cm row spacing and 20 cm intra-row spacing. Each bed thus held ~4 rows of ~50 plants (approximately 200 plants per bed. Transplanting was done in the early morning with beds irrigated just beforehand, so the soil was moist. After transplant (Magh 19), the plants were irrigated approximately once per week. This regular watering (with complete soil wetting at each irrigation) was maintained through the crop cycle; irrigation was withheld about 10 days before harvest to allow bulbs to dry and cure. Rice straw mulch was reapplied between rows immediately after transplanting to conserve moisture and suppress weeds. Manual weeding was performed every two weeks to remove competing weeds, as onion is highly sensitive to weed competition early in growth.

Pest and Disease Management: No chemical pesticides were used. Instead, Bright yellow sticky traps 3 were placed to catch onion thrips and other flying insects. No serious pest or disease issues occurred; occasional thrips were trapped on the sticky cards, but damage remained minimal.

Harvest (25 Chaitra): The onions were harvested on 25 Chaitra (late March) when approximately 70% of the foliage had dried down, a common maturity indicator for onion. At this time the soil was dry, and tops were falling over. The bulbs were lifted and cured in the field. Harvested bulbs were healthy, clean, and uniform in size. The yield is around 160kg.

# Results

The cultivation resulted in a healthy crop with good bulb development. Approximately 800 plants were transplanted. The plants grew vigorously under the nutrient-rich, well-irrigated conditions. By harvest time (about 60 days after transplant), ~70% of plants had dried foliage, indicating maturity. Bulb diameters were measured at 8–12 cm, which is within the optimal range for marketable onions. The bulbs had well-formed necks and rounded shapes, with no notable deformities. No major pest or disease damage was observed. Thrips catches on the sticky traps were modest and did not translate into visible crop injury. Weed pressure remained low due to the initial mulch and timely manual weeding; the plant stand was essentially weed-free during cultivation. Overall, the crop attained a uniform plant density and good size. The large bulb size and plant density suggest a high yield potential.

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