

Cabbage: Its Role in Conservation Planning



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Definition: Cabbage (*Brassica oleracea* var *capitata*), a native of Mediterranean//European region is considered one of the earliest leafy vegetables known to humans. It is a biennial, cruciferous, cool season garden plant with a short stem and a dense circular head. Cabbage usually is grown as an annual and its leaves are used for cooking and also as greens. Even though French navigator Jacques Cartier is credited with introducing cabbage to the Americas in 1530s, the first German settlers are recognized for establishing this crop in the United States. Today, US rank 8th position in global cabbage production.

Purposes

- To conserve soil and water through the use of vegetation
- To maintain and /or improve soil availability, quality, and soil nutrients
- To suppress weeds, reduce insect pests and diseases, and increase crop yield
- To improve soil tilth, soil organic matter, and soil structure

Planting: Cabbage is raised in the southern part of the United as a winter and spring crop while it is a summer and fall crop in the north. It grows ideally on muck, sandy loam and clay soils but also thrives fairly well on mineral soils with organic matter content, moisture and enough attention. Cultivation in saline soils leads to diseases. Heavier loams are proper for fall and early winter planting, whereas a sandier loam is good for the spring crop. Choose locales with fine air circulation, soil drainage, temperatures of 60 to 65 F and soils with a pH of 6 to 7, for planting. Cabbage tolerates a 15 degree frost, effortlessly. For high yield, it is gainful to add decayed manure, compost or a start-up fertilizer to the soil, before planting. Cabbage can be seeded directly or transplanted in the garden. Row spacing for this crop generally differs (24 to 36 inches) depending upon the selection. Three weeks following planting, ensure to side dress the

seedlings with organic rich compost. On a weekly basis, minimum 1 inch of water is required for the plants to grow well.

Disking: Across the world, disking is an imperative practice in farming, performed prior to planting for conditioning the soil, turning under crop residues and breaking them quicker and also for preparing an orderly and uniform seedbed. The process of disking minimizes weeds, kills harmful insect pests, and improves soil quality by cracking up large clods of heavier soils. Disadvantages of disking include soil erosion on sloppy land, reduced water infiltration, expenses for machinery and labor, and an overall decline in productivity.

Crop Rotation: Crop rotation is a planned system of raising crops in a sequence on the same piece of land. This practice improves physical, chemical, and biological conditions of the soil. Strictly avoid growing cabbage on the same farm/soil continuously for more than 3 years. Rotation is necessary to control various root rots and also for gaining rot-free yield. Also, crop rotation limits pests buildup, lessen soil erosion, avoid diseases and maintain a healthy farm. Cabbage is often rotated with less fertility-demanding crops. Thrips create problems when cabbages are planted near winter wheat, oat, or alfalfa. A site where legumes (beans and peas) grew well previously makes the perfect spot for cabbage production. In a rotation program, cabbage is an appropriate preceding crop for okra while a winter cover or a cole crop can succeed productively.

Mulching: Bits and pieces of natural materials used as a protective layer to preserve the top surface of the garden plants are called mulches. Mulching positively affects the soil structure and temperature, and benefits crop production through soil and water conservation, aeration, and soil tilth production. Besides, mulches reduce water and wind erosion, soil compaction, and weed growth. Mulching with straw and compost/manure regulates soil warmth, prolongs soil humidity and enhances yield. Living mulches are cover crops that are inter-planted with vegetables in a minimum or no-tillage system. Cabbage as a cool crop will be benefitted from organic mulches such as leaves, bark, grass clippings, hay, and wood shavings.

Cover crops/green manures: These are crops (for example: small grains, grasses or legumes) grown all through or in-between main crop production stages with the aim of defending and improving the soil. Cover crops are interrelated with crop rotation for maintaining a healthy farm but are not harvested. They are plowed under before flowering, in the finish of the growing season. Cover crops reduce soil erosion, advance soil structure, generate fertile soil, capture left-over fertilizer, eliminate diseases, pests and weeds, and minimize evaporation from the surface of the soil. Cabbage being a shorter vegetable, bush grouping cover crops like red clover must be used for rotation. Currently, cover crops and vegetables are grown together for all or part of the growing season. This method remarkably helps assist extending weed control, producing biomass and building habitat for favorable insects. Other compatible winter cover crops for cabbage include oats, hairy vetch, and ryegrass.

Weed and Pest Management: Initial weed control practices are very vital for *Brassica* genus. Weed management in conventionally grown vegetable crops relies on tillage and pre-emergence

herbicides. Mostly in cabbages, pre-emergence herbicides are fairly effective in shrinking weeds. Clean field, quality seeds, wide row planting, crop rotation, cultural control, shallow cultivation, and hand-weeding are other successful ways of reducing weed competition. Cabbage as a fast growing vegetable crop can competently suppress weeds by shading. Common cabbage pests include webworm, cabbage looper, aphids, diamondback moth etc. Usually, worms bother the plants before head formation. Removing the outer leaves stops the worm attack to a great extent. Further, usage of row covers and spraying neem/oil/neem extracts can avoid flea beetles. Companion planting with Chinese Giant Mustard will divert the flea beetles extremely. Two to three days prior to transplanting, broadcasting and disking in 1500 lb of hydrated lime per acre is a good technique of clearing out clubroot. Site selection, crop rotation, mulching, regular monitoring, resistant/certified varieties, organic repellents (example: hot pepper powder, garlic juice,) insecticides, high pressure sprays, etc. effectually prevent pests.

Harvesting: Transplanted cabbage varieties commonly are ready to harvest after 70-110 days and direct seeded ones after 90 to 140 days. For maximum yield, cut cabbage heads (the typical cabbage weighs 3 to 6 lbs and is hand harvested) when they attain full volume and move them rapidly, out of the sun. Next, get rid of root residue from the garden to keep the soil disease free.

Residue Management: The amount of crop residue produced and subsequently available for erosion control depends on the type and yield of the crop grown and the tillage system used. The management of residue is a valuable technology for reducing erosion and improving run-off water from agriculture lands. Cabbage crop residue incorporated into the soil decomposes faster than residue left on the soil surface. The rate of crop residue decomposition is imperative from both agriculture and environmental standpoints. Crop residue, if retained on the soil surface, can noticeably reduce soil erosion. The total fresh residue mass (root and shoot) ranges from 26,000 to 27,000 lbs/acre (3800 - 4000 lbs/acre of dry residue.) Cabbage residue contains 42.20 % carbon and 2.56 % nitrogen. At this rate, the crop returns 1600 –1700 lbs of carbon, and 97 to 102 lbs of nitrogen per acre. Leaf Area Index (LAI) is the unit area of leaves per unit area of soil surface. LAI of cabbage goes up to a maximum of 2 after 60 days of transplanting. Cabbage provides thick vegetation with more than 50% canopy cover after 45 days of transplanting. It provides 70 to 80% canopy cover after 60 days and until the final harvest. The yield of watermelon on a heavy soil ranges from 21,000 to 25,000 pounds per acre. As the crop returns a large quantity of plant residue and its canopy cover goes beyond 50%, it can be advocated for regions with high precipitation and erodible soils.