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Types of Mulch Material for Fruit Production

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Mulch is a layer of material applied to the surface of an area of soil. This is one of the important soil management practices adopted in certain countries. Crop residues like straw, cotton stalks, leaves, saw dust, pine needles, coir dust arid other materials like polythene films or certain special kinds of paper are spread in the tree basins and in inter spaces between trees. It affects soil temperature (depending on color, soil-mulch contact, bed orientation, time of year, light quality), reduces the weeds and keeps the fruit clean.

Mulch Materials types

A. Organic Mulch Materials

1. **Composts:** Composts reduced the growth of plant pathogenic organisms. It also used to avoid possible phytotoxicity problems. Materials that are free of seeds are ideally used, to prevent weeds being introduced by the mulch. Compost mulch had the highest water use efficiency by basil (Palada *et. al*., 1992).
2. **Dry leaves:** Though leaves are good for protecting dormant plants during winter by keeping them warm and dry but due to light weight they may be blown away even by light wind. To counter this problem, it requires anchoring which can be done with stones, chipped bark and covering with net or some form of sheet.
3. **Dust mulching:** Dust mulching is the practice of repeatedly and shallowly cultivating the soil surrounding the crop to create a pulverized (dust) layer of soil (James, 1945). It is generally accepted that the primary benefit from dust mulching comes from the destruction of weeds around the crop and not a reduction in evaporation at the soil surface (Rowe-Dutton, 1957).
4. **Grass Clipping:** It provides nitrogen to the soil, if incorporated fresh. However, application of green grass in rainy season may result into the development of its own root system which will be detrimental to plant growth.
5. **Hulls and ground corncobs:** Ground corncobs are very good material for mulching purpose, some people find their light colour objectionable. A layer of 5-10 cm of ground corncobs provides mulch. They can be easily blown by the wind, so heavier mulch, such as partially rotted hay or straw, may be used on top to hold down the lighter materials.
6. **Hydro mulching:** Hydro-mulching includes wood cellulose fiber mulch (Acquaah G., 2009). Hydroseeding (or hydraulic mulch seeding, hydro-mulching, hydra seeding) is a planting process that uses slurry of seed and mulch. It is often used as an erosion control technique on construction sites, as an alternative to the traditional process of broadcasting or sowing dry seed.
7. **Living Mulch:** The most important attributes required for species used as living mulches are quick emergence and soil covering, short height, low water and nutrients demands. In most cases the legume crops or cereals, especially rye (*Secale cereale* L.) are used for this purpose. The living mulch not only provides for the effective management of weeds but

also for the decrease of insect pest pressure resulting in lower requirement for pesticide use.

8. **Paper-based mulches:** It is earliest mulching systems developed for fruit production. It is ideal mulch because it could be transported long distances and easily applied from a roll in the field.
9. **Peat mulch:** Peat being fine in texture has good moisture holding capacity and it is effective soil conditioner but it does not have good nutrient value.
10. **Poultry Mulch:** Poultry litter in many areas is available at poultry farms. Poultry litter or broiler litter is a mixture of poultry excreta, spilled feed, feathers, and material used as bedding in poultry operations. It can be used as a mulch material in fruit crops.
11. **Old carpet:** It makes free, readily available mulch. Old carpet can be used on the walkway between the plant rows as mulch to protect from weeds.
12. **Sand:** Many grades of sand are available and can be used as a growing medium or as a component of various substrate mixtures in order to improve the drainage properties.
13. **Sod:** In this method, permanent cover of grass is raised in the orchard and no tillage is given. This type of orchard cultivation is followed in USA and Europe.
14. **Sod mulch:** This is similar to sod with the only difference is that the vegetation is cut frequently and the cut material is allowed to remain on the ground.
15. **Straw:** Though straw is poor in nutrient value but after decomposition, it makes soil more fertile. Among organic mulching materials, straw has a long life in comparison to other mulches.

B. Inorganic Mulch Materials

1. **Plastic mulching:** Spreading polyethylene sheets over the seed bed provides warmth for germination and seedling growth. The use of clear plastic mulch allows sunlight to heat the soil, stimulating growth and fostering early yield. Opaque sheets minimize weed problems, since weeds receive partial light while germinated seeds receive full light. Solarization techniques use clear plastic mulch to heat soil to temperatures high enough to kill soil borne pests. Generally, researchers using black plastic instead of bare soil have recorded higher yield of many crops.
2. **Rock and gravel:** In cooler climates the heat retained by rocks may extend the growing season. For driveways, paths, parking areas, utility areas, weed, fire control and other uses, crushed rock can be an ideal solution. This mulch is most useful in landscape gardening.
3. **Rubber mulch:** These mulches made from recycled tire rubber. Rubber mulch generally consists of either waste tire buffing or nuggets of rubber from tires that are ground up whole, after having their steel bands removed. It is beneficial for soil moisture, reduces fungus growth, weeds growth, and becomes a weed barrier, as weed seeds dehydrate in the mulch before reaching the soil.
4. **Lithic-mulches:** These include pebbles and gravel as well as volcanic ash. Depending on the site and crop grown, lithic-mulches could take the form of mounds around individual plants, long rows or ridges of larger stones or vast areas where an entire production site is covered in pebbles or volcanic ash (Lightfoot, 1994).It modulate fluctuations in soil temperatures as well as reduce weeds. These mulches may have been used with grapevines or olive trees.
5. **UV-reflective mulches:** These mulches consist of a polythene base to which a thin coat of aluminium ions adhered. The mulches collectively referred to as metalized mulches. These mulches reflect UV wavelength which confuses repels incoming alate aphid, adult, white flies and leafhoppers. Therefore, reduced the incidence of these insects and disease born by insects like aphid.
6. **White or aluminum reflective mulch:** White or aluminum reflective mulch is used where soil cooling is desired, such as establishing fall crops during the heat of summer. Research has shown that white or aluminum reflective mulch also repels aphids which spread some virus diseases in vine crops such as squash.

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