

## Design and construction of a bulking machine for low country orthodox black tea

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There are about 20 grades of made teas produced in the low country tea factories. Each invoice needs a minimum of 400 kg of a particular tea grade, which may take several days to fill depending on the grade concerned and the scale of operation of the tea factory. Since the quality parameters vary from one day to another and during storage, all teas in the invoice of a particular grade are mixed (bulked) prior to bagging, to minimize quality variations and to fetch a higher price at the auction.

Even though 3 labourers can mix (bulk) tea up to about 900 kg/h, high cost of production, unsatisfactory mixing, and breakage of particles by trampling are problems of the manual bulking method. Therefore, a bulking machine was designed and constructed at the Tea Research Institute, Ratnapura, Sri Lanka, to mechanize this operation and to prevent above problems, which will benefit over 800 tea factories.

Three bags of tea are emptied to separate compartments of the hopper that delivers them at equal rates, to the inclined belt conveyer, which discharges tea to the mixing chamber. Inside the vibrating chamber, tea flows over two sets of plates and is mixed well. At the bottom of that chamber, a rotating chute is fixed to drop tea on the floor, in a circle. Thereafter, tea is bagged directly from the heap.

Tests revealed that the machine has the capacity to mix OPA grade tea at the rate of about 2260 kg/h using 2 laborers, which is about 2.5 times the rate of manual bulking by 3 laborers. Tests revealed that the machine mixed tea is better and is free from breaking of particles, compared to manual method.

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