

RESEARCH PAPER:

Assessment of pollution load of winery wastewater collected during vintage and non-vintage seasons and analysis of wastewater irrigated soil

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SUMMARY

The waste water from the wine producing industry has been collected in two distinct seasonally representative situations: the vintage and non-vintage seasons of the year. However, concentration values were higher than limits allowed by local authority for discharge into the municipal sewage system. The wastewater is strong and highly variable in terms of pollutants, and tends to become odorous upon standing. Chemical oxygen demand (COD), Biological oxygen demand (BOD) and Total dissolved solid (TDS) were the major pollutant present in the winery waste water. When soil conditions are suitable, land treatment of wastewater for irrigated cropping or forestry systems can be successfully practiced, especially with low pollution wastewater. However, on poorly drained soils, effluent irrigation can lead to water logging as well as salinization and sodification due to inadequate salt leaching.

Key words :

Winery waste water, Vintage and non vintage season, Wastewater irrigated soil

The wine industry in India is projected to grow at more than 25 per cent annually in the next decade, making it the fastest growing industry in the country. The investment in wine industry in Maharashtra has increased by 32.80 % in the financial year 2007-08, against Rs. 247.71 crores in the previous year, with the establishment of new wineries. Around seven new wineries, including one in Buldhana, two each in Nasik, Pune and Sangli were set up this year. More than Rs. 81.26 crores was invested in these seven wineries. Today, the state has 58 wineries and total investment in these wineries is around Rs. 328.97 crores (Pawar, 2008).

The worldwide wine production is $261 \times 10^5 \text{ m}^3$ of which 69% from Europe, 18% from America, 5% from Asia, 4% from Africa and 4% from Oceania. The worldwide wine consumption is $228 \times 10^5 \text{ m}^3$, distributed by Europe (68%), America (20%), Asia (7%), Africa (3%) and Oceania (2%) (Nakov *et al.*, 2002).

All the quality and quantity of winery waste differs significantly from season to season. Winery waste can be divided into vintage season and non-vintage season waste. The vintage season begins in August and lasts until February and the non-vintage season involves the period from early March till the end of July. Each period generates different types of waste and different qualities and thus, waste should be treated separately for each season applying the

necessary modification in every case. During every vintage period, bigger amount of winery waste water is released than the non-vintage period.

The present work deals with a laboratory scale attempt to know the pollution load generated by wastewater from medium scale wine industry, before discharging it into a municipal sewage treatment plant. The aim is to assess an efficient and economic system capable of reducing the concentration of pollutant below the limits imposed by BIS regulations (COD=250 mg/l, BOD=30 mg/l, TSS=100 mg/l). Winery wastewater contains high concentration of nutrients, such as high concentration of organic compounds nitrates and phosphates. (Busamante *et al.*, 2005) As a result waste water discharge, irrigation and reuse cannot be undertaken without prior treatment. Both of which lead to reduction in biological oxygen demand (BOD) and chemical oxygen demand (COD). The activity of winery water has resulted in investigation of several treatment methods. Wastewater from the wine industry has a high organic content, contains both suspended solid (TSS) and total dissolved solid TDS and is acidic. Increased concentration of (TDS) can close soil pores and limits the aeration of soil and the flow of water through soil. Concentrated organic

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