

Chapter - ISUMMARY AND CONCLUSIONS

- (1) Distillery waste can be treated in anaerobic lagoons at an organic loading of 1.912 Kg.BOD/cum/day obtaining a BOD removal efficiency of 80 percent. However, the optimum organic loading can be taken as 0.604 kg.BOD/cum/day where the present BOD removal efficiency is 95-96 percent.
- (2) A minimum solids retention time or detention time of 13 days is recommended to operate anaerobic lagoons while treating spent wash. The poor performance of septic tanks or anaerobic lagoons is partly attributed to the inadequacy of detention time rather than temperature variations.
- (3) A seed sludge concentration of 15-20 percent V/V is recommended for anaerobic digestion.
- (4) Dilution of spent wash did not yield any better performance. In fact, concentrated spent wash gave better results.
- (5) The addition of ferric salt did not improve the performance of lagoon.
- (6) When cation potassium was present at a concentration of 8,000 mg/l along with cations sodium (150-150 mg/l) and calcium (500-600 mg/l) lagoons operated normally. However, when cation potassium was in the range of 300-800 mg/l and sodium concentration was 7,000-10,000 mg/l, and calcium was 200-300 mg/l, the lagoon performance was drastically effected.

In another study when potassium concentration was 8,000 mg/l, even a cation sodium concentration of 15,000 mg/l was tolerated in lagoons.

The optimum concentration of cation potassium when excess concentrations of cation sodium are present is to be established.

(7) The neutralisation of spent wash did not help to improve lagoon performance. In fact, it deteriorated lagoon performance. The cation calcium was found to be more detrimental to methane fermenters. A cation calcium concentration of 2,000 mg/l is found to be toxic even in the presence of cation potassium at a level of 8,000 mg/l.

(8) The pilot plant results are found to give fairly comparable results to that of bench scale results.

(9) Lagoons can operate even at a volatile acids concentration of 22,000 mg/l, provided the pH is well above 6.5. The toxicity is mainly due to pH and not that of volatile acids.

(10) It is immaterial whether the depth of lagoon is 0.9 metres or 3.0 metres as far as the BOD removal efficiency is concerned provided the same organic loading is used.

(11) A binomial equation is presented to explain the total solids increase in pilot lagoon which is operated for a prolonged period of time.

(12) The full scale treatment plant results are comparable to the results obtained in bench scale and pilot plant studies.



In one of the full scale treatment plant two stage digestion was found to reduce the detention time considerably.

(13) When lagoon effluent is applied on land, even a potassium accumulation of 19,000 lbs/acre did not harm the soil characteristics. It is due to the fact that potassium was present in non-exchangeable form.

(14) The ISI ~~max~~ specifications need to be modified and a systematic study should be conducted on various Industrial wastes to put the limits of BOD and inorganic salts when they are applied on land for irrigation.

(15) The aerobic treatment followed by anaerobic lagooning method will not solve the problem of disposal of distillery wastes, unless the dissolved inorganic salts are removed by costlier methods such as evaporation, incineration, dialysis and ion-exchange process etc.

(16) The limits of anaerobicity for waste water when it is applied on land need to be studied.