Tips for Energy Conservation in Agricultural Sector

CONSERVATION IN AGRICULTURE PUMPS

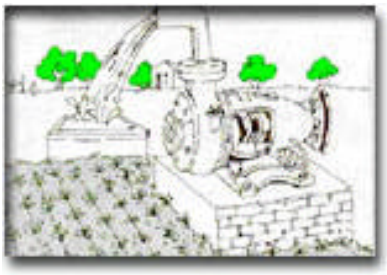

Fig-1

1. Which is the foot-value, that saves more diesel ?

- The foot-valve shown in Fig-1, because it has a wider mouth and a larger area of opening.
- The larger valve helps save diesel because less fuel and less power is needed to draw water from the well.
- An efficient low friction “ISI” mark foot-valve, though costlier, pays back fast the extra cost by saving a lot of diesel.

Fig-2

Fig-3

2. Which type of pipeline helps save diesel ?

The rigid PVC pipeline, with a larger diameter, shown in Fig-2. More diesel is required to pump water through small diameter pipes because it offers higher friction. If the pipe is larger than the pump flange size, a reducer must be used.

(please check the following: is there are question and an answer or just the continuation of the above—in that case question no would have to be inserted and subsequent numbers changed)

How does a 20 mm decrease in diameter increases the friction three times: ,if, in place of 100 mm (four inch) pipe, an 80 mm (three inche) pipe is used, the loss due to friction for drawing the same quantity of water will be three times more, which will cause higher fuel consumption. Also pipes made of rigid PVC cause lower frictional loss as compared to pipes made of conventional galvanized iron. Such pipes thus help save fuel.

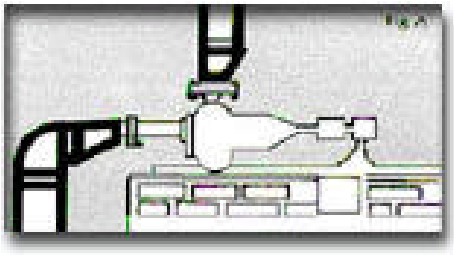

Fig-4

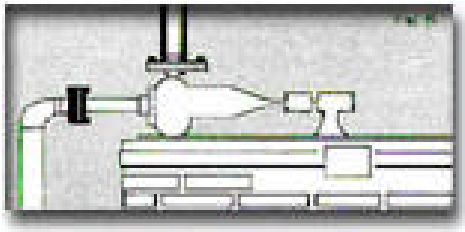

Fig-5

3. Which type of pipeline arrangement helps save diesel?

The one shown in Fig-4.

The pipeline arrangement shown in the figure in question has many bends and unnecessary fittings, which causes higher diesel consumption. Each bend in an 80 mm (three inch) diameter pipeline leads to as much friction loss as an additional pipe length of three meters.

Therefore, the fewer the number of bends and fittings in a pipe, the more the diesel saving.

Fig-6

Fig-7

4 Which type of bend should be used in a pipeline?

The type of bend shown in Fig-6. Sharp bends and L-joints in the pipe lead to 70 per cent more frictional loss than standard bends.

Fig-8

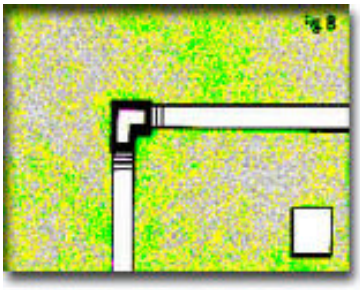

Fig-9

5. Which type of installation is better?

The one shown in Fig-8.

The pump works most efficiently when it is not more than 10 feet above the water level. If the well is deep, the pump should be installed on a platform at the right height.

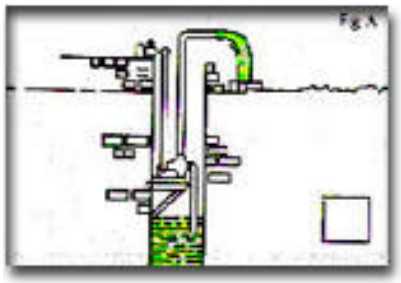

Fig-10

Fig-11

6. Which length of pipe helps save diesel?

The pipe of short length shown in Fig-10. The pipe shown in Fig-11 is unnecessarily high and would require more fuel for pumping water. A farmer can save 15 litres of diesel every month simply by reducing the pipe height by 2 metres.

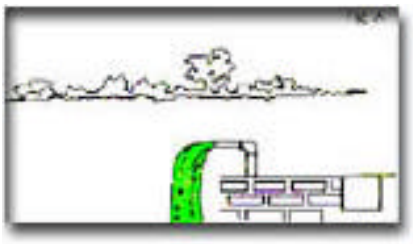

Fig-12

Fig-13

7. Which transmission is better?

The transmission shown in Fig-12. The belt in Fig-13 is old and worn out. It could slip or snap anytime, causing loss in the transmission of power and hence increase fuel consumption.

Fig-14

Fig-15

Check points for efficient transmission.

- Reduce the number of joints in the belt.
- Check and adjust belt tension frequently.
- Check alignment of the pump with the engine.

HOW TO SELECT THE RIGHT TYPE OF PUMP SET?

The various pumps sets available in the market require different quantities of diesel for pumping water. Therefore, it is important to choose an “ISI” mark pump.

The pump selected should be suitable for the well and the water requirements. It is not necessary that the pump that is good for the neighbouring farm is good for yours. If the following information is given to an expert, he would be able to help to choose the right pump:

1) The depth of your well.
2) The area of your field.

It is also necessary to select the right engine, which makes the pump run at the right seed. For this, consult an expert. The engine used should have sufficient horsepower (HP) to operate the pump. The expert can calculate the amount of power needed for the particular engine. It is always better and beneficial to select a well-known and good quality engine. Look for the “ISI” mark of quality on the engine.

To ensure a high level of operational efficiency of the diesel powered engine, ensure the following:

- Engine should not emit too much smoke.
- Use the correct grade of lubricant recommended by the manufacturer.
- Engine should be fitted with an oil filter.
- Engine should have an air filter, which should be cleaned regularly.
- Engine jacket cooling water should be warm.