AGRI-FACTS
Practical Information for Alberta's Agriculture Industry

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Choosing a Water Pump

Water pump characteristics			
Type of pump	**Advantages**	**Disadvantages**	**Applications**
Shallow well jet	• Can be offset from the well • Can be adapted to wells of various yields • Requires little maintenance • Inexpensive	• Efficiency decreases as total suction lift increases • Easily damaged by sand • Gas locks easily	• Total suction lift less than 6 m (20 ft.) • Commonly used on dugouts*
Deep well jet	• Can be offset from the well • Can be adapted to wells of various depths and yields • Requires little maintenance • Inexpensive	• Efficiency decreases as total suction lift increases • Easily damaged by sand • Gas locks easily	• Practical for less than 25 m (80 ft.) total suction lift • Used in dugouts in combination with dugout-side well
Submersible	• Very efficient • High capacity • Capable of pumping water from great depth • Requires little maintenance • Inexpensive	• Easily damaged by sand • Gas locks occasionally • Minimum well diameter 100 mm (4 in.)	• Depth not normally a limiting factor • Used in dugouts in combination with dugout-side well
Piston (shallow and deep well)	• Deep well pumps are more tolerant of sand than other pumps • Can pump water containing dissolved gases • Constant rate discharge • Suitable for small diameter wells	• Pump service can be costly • Low discharge • Expensive • Deep well pumps cannot be offset from the well	• Shallow well; total suction lift less than 6m (20 ft.); commonly used on dugouts • Deep well: depth not normally a limiting factor

Alberta
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Factors to consider when sizing a water pump

Daily water requirements

Human	225 - 450 L	50 - 100 gal
Beef cattle	25 - 75 L	5 - 17 gal
Hog	10 - 20 L	2 - 5 gal
100 turkeys	40 - 60 L	9 - 13 gal
Dairy cow	35 - 110 L	8 - 24 gal
Horse	30 - 45 L	7 - 10 gal
Sheep	5 - 20 L	1 - 4 gal
100 chickens	20 - 30 L	5 - 7 gal

Optimum pumping rate (L/min) or (gal/min)

$$= \frac{\text{water volume required per day}}{\text{minutes of pump time per day}}$$

e.g. $\frac{960 \text{ gal/day}}{240 \text{ min/day}} = 4 \text{ gal/min}$

Well yield

When the farm well is unable ot yield sufficient water to meet the optimum pumping rate, the pump should be chosen to match the well yield. Peak water demand is met by providing one or two large pressure tanks for water storage. Very low well yields (less that 10 L/min. or 2 gal/min.) usually require a cistern for intermediate storage and a second pump.

Well diameter

Wells larger that 100mm (4 in.) in diameter can accommodate most farm water pumps. Wells less that 100 mm (4 in.) in diameter limit the type of pump that can be installed. Normally, deep well piston pumps or specifically designed jet systems are used.

Depths and distances

Other factors to consider are:

- depth to pumping water level
- distance between pump and well (for shallow well pumps and deep well jet pumps)
- distance between pump and final outlet point
- Height difference between well and outlets

Available power

Most farm water pumps are available with either 115 volt or 230 volt single phase motors. Normally, a pump will operate more efficiently and consume less power with a 230 volt motor. Larger pumps require three phase motors.

For more information contact an Agricultural Water Specialist with Alberta Agriculture, Food and Rural Development at the following locations and phone numbers:

Lethbridge	(403) 381-5846
Red Deer	(403) 340-5324
Grande Prairie	(780) 538-5606
Edmonton	(780) 422-5000

UR12/04/500

Information required for sizing a water pump

Complete this table if you are purchasing a new water pump. The pump supplier can use this information to provide the correct pump for your situation.

Name _____

Address _____ Phone _____

Water pump required for: Well _____

Dugout _____

Cistern _____

Other _____

Intended application House _____

Barn _____

Feedlot _____

Irrigation _____

Other _____

Optimum pumping rate _____ L/min or _____ gal/min

Well depth _____

Pumping water level _____

Well diameter _____

Well yield _____ L/min or _____ gal/min

Dugout: Length _____ Width _____ Depth _____ m or ft.

Distance between pump and well or pump and dugout _____ m or _____ ft.
(shallow well pumps and deep well jet pumps only)

Distance between pump location and final outlet point _____ m or _____ ft.

Height difference between well or dugout and outlets _____ m or _____ ft.