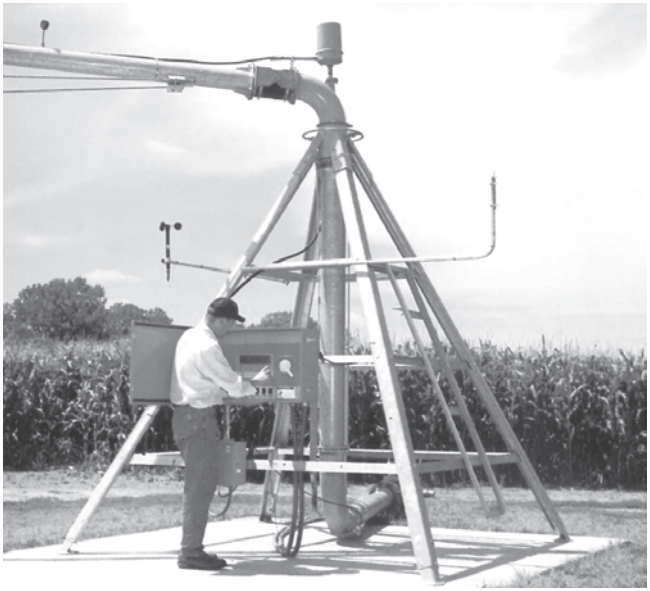
FIGURE 10.4 - The Central tower and the control panel.



Driving

The CP irrigation system is fully mechanized automated. The drive system features small electric motors (standard HP 0.75) mounted one on each two-wheel tower. Whereas electric power is not available a generator is attached to the system. An automatic alignment system keeps always the lateral in a straight line. The distance that is covered by each tower varies, as the distance around the circle is greater at the far end of the pipeline and smaller near the center. The towers (Figure 10.5) do not move continuously, but in a series of starts and stops controlled by the movement frequency of the outer guide tower. The percent time set the fraction of time that the guide tower motor operates during each movement cycle, thereby setting the rate of revolution and the application rate. Micro-switches in the alignment mechanism operate the motors of interior towers to keep the system properly aligned.

FIGURE 10.5 - The Support towers.

The generator

In most cases and especially in areas without electricity facilities a small generator set attached to the central tower, diesel driven with fuel tank, provides the electric power for the system operation.

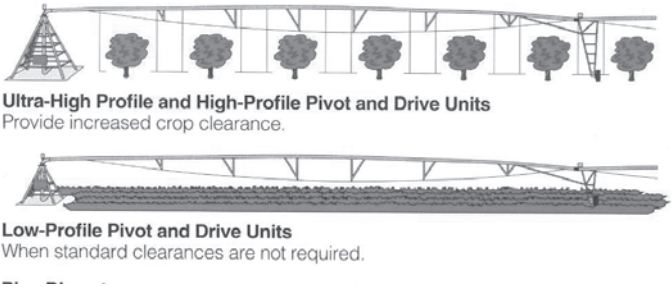
COST

The cost of each system unit is relatively high and varies from US$ 2 500–US$750 per ha depending on the size of the area. It is best suited to large irrigated farms. A relatively small to moderate unit with four spans pipeline of approximate 220 m radius for a 15 ha area per position costs around US$35 000.

ADVANTAGES

- High irrigation application efficiency 75–85 percent resulting into water savings, with the absolute control of the irrigation water from the source to the plants (Figure 10.6).
- Higher application uniformities as compared with other sprinkling or spraying systems because of continuously emitters.
- With the completion of one irrigation the system is at the starting point.
- Savings in labour and fuel
- Reduced tillage and associate costs
- Salinity control. Essential leaching of the root-zone at the end of the season is highly efficient with CP
- Supplementary irrigation in rain fed grains in drought periods.

FIGURE 10.6 - High and Low-profile structures.



DISADVANTAGES

- High initial purchase cost.
- Not practical for small holdings

DESIGN CRITERIA AND CONSIDERATIONS

Design and erection

The manufacturers/suppliers are responsible for the design of the mechanical structures and the drive mechanisms for CP systems, since a specific knowledge of all the system components and features is required. They are also responsible for the erection of the machine (Figure 10.7). A turnkey system is provided to the end user. They also provide operator's