



EM4823

Asparagus Irrigation Management in a Water-Short Year

Harvest Period

Soil water levels in the root zone at or near field capacity before the beginning of harvest will minimize drought effects. Evaluate the soil water status in your fields in late March or early April to a depth of at least 4 feet if possible. Irrigate to fill the root zone if the soil profile is not at field capacity. There is some concern that early irrigation may delay harvest and reduce production; however, the advantages of maintaining early, soil water storage far outweigh the perceived disadvantages.

A full root zone soil profile before harvest begins should delay irrigation needs until after harvest on soils with moderate to high water holding capacity (fine sandy loams, loams, and finer-textured soils) and greater than 3 feet deep. Shallower and coarser-textured soils may require one or two irrigations during this period. Carefully monitor all soils.

If available soil water in the top 3 feet of soil falls below 50% of the total available, apply irrigation. Studies under rill, wheel-line, and solid set sprinkler in the Yakima Valley and south Columbia Basin on deep (>4 ft) fine sandy loam and silt loam soils show cumulative asparagus water use averaged 5.2 inches during April, May, and June.

Water supply during the harvest period should be sufficient to meet these crop needs. However, water availability towards the end of the harvest period may become quite limited. The overall result may be an earlier harvest cutoff date than normal. Light, frequent irrigations often applied in an attempt to cool the asparagus growing

environment and extend the season may not be possible or even recommended. Most of the water applied in this situation evaporates and generally does not increase soil water storage.

Good weed control during harvest will be an extremely useful measure to minimize soil water losses.

Fern Growth Period

Asparagus is often thought of as being fairly drought-tolerant. Where soil conditions allow, this crop can have rooting depths of 6 feet and more. However, under irrigated conditions, studies have shown asparagus extracts most of its water from the top 3 to 4 feet of soil. It is important to irrigate and perform other cultural practices to maximize fern top growth and sustain it for as long as possible into the fall. This will result in better yields the following spring.

If at all possible, apply large irrigation applications (4 to 6 inches) at least once every 3 to 4 weeks during the fern growth period to maintain fern vigor. Where soils are shallower and coarser-textured, apply 2 to 3 inches every 10 days to 2 weeks.

The rill, wheel-line and solid set sprinkler studies mentioned show asparagus water use averaged 6.8 inches in July, 7.6 inches in August, and 4.6 inches in September. Irrigations were infrequent and applied large amounts of water. Soil water levels in these studies dropped to more than 75% depletion of available soil water in the top 4 feet during the fern season. There was not excessive

irrigation during the peak use periods. At this time the fully developed ferns used water at a rate between 80% and 90% of alfalfa reference evapotranspiration (70% and 80% of pan evaporation).

Weed control in a short water year becomes extremely important. Besides competing for water, nutrients, and light, in rill irrigation weeds can create significant problems with water distribution, and in wheel-line and hand-line sprinkler irrigation interfere with moving the system. Use recommended weed control practices at the end of harvest. If at all possible, use chemical control measures and avoid tillage. Do not irrigate prior to weed control, especially if cultivation is used, as evaporation from the soil will waste water. Try to avoid irrigating after layby until the asparagus is up and fairly well ferned out. This may help delay weed seed germination until the asparagus ferns shade weeds and crowd them for light. If weeds do grow in the irrigated furrows, seek some means of control, as this greatly retards water movement in the furrows and causes low water application efficiency and uniformity.

Continue all other cultural practices at normal levels. The impact of drought during the fern growth period will show up during harvest the following spring. Everything that can be done to grow good, healthy ferns will help production in the following year.

Going into the fall and winter with dry soil conditions is a major concern at the end of the growing season. Hard winter freezes can cause crown damage under these conditions. If any water is available, a late season irrigation will help to insulate the root zone and minimize potential winter freeze damage. This is true for all perennial crops.

Stretching Water

Evaluate and improve irrigation systems to obtain high application efficiencies and uniformities. Large acreages of asparagus are rill-irrigated. Construct facilities to catch and re-use all tailwater runoff on rill systems. Irrigate in only one rill per plant row, preferably the same rill, for the entire season.

Test solid set, hand-line, and wheel-line sprinkler systems to ensure equal water distribution throughout. This means having the same size nozzle on all sprinklers. If there are large elevation changes on your system, consider using pressure compensating nozzles or pressure regulators to even out the sprinkler flow rates. Avoid using sprinklers in the heat of the day and during windy periods if at all possible.

Obtain information from your local National Resources Conservation Service or Washington State University Cooperative Extension office about the soils in your fields. Soil depth, water-holding capacity, and infiltration rate are key factors in good water management. Knowledge of these factors will help you to devise an irrigation management program that will not waste water.

Information on soil moisture monitoring and crop evapotranspiration from Washington's Public Agricultural Weather Stations (PAWS) and Washington Irrigation Scheduling Expert (WISE) are available on the Scientific Irrigation Scheduling (SIS): web page <http://sis.prosser.wsu.edu>

Drought advisories and other Washington State University Cooperative Extension Bulletins are available online at <http://pubs.wsu.edu>
Type "drought" in the search box for downloadable files.

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