

## **Agricultural Operations at Minnesota Airports**

Many communities lease airport land for agricultural use as a means to offset the costs of operating the airport. While this practice is attractive for the financial benefits, care must be taken to ensure that it does not interfere with aircraft operations.

There are a number of protective surfaces surrounding the runway. First is the primary surface which overlays the runway at the elevation of the nearest point of the runway centerline. The primary surface runs the length of the runway for turf runways and extends 200 feet off each end for paved runways. The minimum width of the primary surface is 250 feet centered on the runway. If either end of the runway has an instrument approach the primary surface is 500 feet wide. For runways with instrument approaches with visibility minimums of  $\frac{3}{4}$  of a mile or less and for runways with precision approaches such as an ILS the primary surface is 1,000 feet wide.

It is our position that there should never be any farming within 125 feet of the runway centerline. This area should be kept in grass and maintained by the airport. This area is reserved for aircraft that depart the runway to minimize damage and to allow emergency vehicles to quickly access that aircraft. Only, airport vehicles should be allowed to operate in this area and drivers should be trained on the usual aircraft patterns and procedures and taught to give way to aircraft landing at the airport.

For runways with wider primary surfaces, some low crops may be allowed beyond 125 feet from the runway centerline. Low crops are considered those with a height of less than 4 feet when mature that require minimal attention to harvest. Runways with ILS approaches must not have any farming within 250 feet of centerline because of the possibility for interference with the localizer signal. Vehicles and equipment used in planting, watering, fertilizing, weeding and harvesting are obstructions and should be kept to a minimum. When these vehicles are operating in the primary surface a NOTAM should be issued to make pilots aware of their presence. The vehicle operators should be trained to never leave the equipment in the primary surface and to never cross the runway with a vehicle. These vehicles should not be allowed in the primary surface on bad weather days as they may obstruct the navigation signal to the aircraft causing the aircraft to have to abandon an approach.

Soy beans, alfalfa, peas, wheat, barley and oats would all be considered low crops and suitable for planting in the outer areas of the primary surface. Hay is a suitable crop for these locations, but when the hay is baled the bales must be removed immediately.

Each airport will have unique concerns based on the airport layout and differences in the elevation of the terrain. Sightlines are important on airports. Care must be taken to ensure that crops do not obscure sightlines between intersecting taxiways and runways. At non-towered airports pilots should be able to see the entire length of the runway from behind the hold short lines. For airports with multiple runways, sightlines to all runway ends should be kept clear to the maximum extent possible.

Runway safety areas also overlay the runway and extend beyond the runway ends. The runway safety areas provide an area around the runway that can support airport vehicles for maintenance including snow removal and aircraft rescue and firefighting equipment. This area should also support the occasional passage of aircraft without causing structural damage. Though we do not require that airports maintain runway safety areas, farming in these areas is not recommended. For specific dimensions for the runway safety area please contact your regional engineer.

The approach surfaces extend outward and upward from the ends of the runway. The approach surface starts at the end of the primary surface, at the width and elevation of that end of the primary surface and rises at a slope determined by the types of approaches to the runway. The approach surface also expands at the sides to create a trapezoid.

The most restrictive approach is the precision approach such as an ILS. For runways with precision approaches the crops should be kept back 700 feet from the end of the runway.

If there is an instrument approach to a runway end and that runway is meant to serve large aircraft or jet aircraft, then the approach surface goes up one foot for every 34 feet from the end of the primary surface. No crops should be grown within 600 feet of the end of the runway. Adjustments should be made for changes in the elevation of the terrain. If adjusting inward never allow crops closer than the distances for runways with visual approaches as described below.

For runways that have only visual approaches or for runways with non-precision instrument approaches that are designed only for small aircraft the approach surface rises one foot for every 20 feet from the end of the primary surface. This means crops should be kept back 200 feet from turf runway ends and 400 feet from paved runway ends. These distances may have to be adjusted outward for rising terrain since the slope is in relation to the elevation of the runway end. These distances should never be adjusted inward even where the terrain slopes downward.

The approach surfaces also expand as they go out. The precision approach surface expands 30 feet from centerline on each side for every 200 feet out from the primary surface. This makes the approach surface 150 feet wider 700 feet from the end of the runway than it is at the runway end. Though some runway approaches do not expand that fast, since there are many variables, the safest approach is to keep the crops back an additional 30 feet from centerline for every 200 feet from the end of the primary surface.

Another concern for agricultural leases are on-airport navigational aids like ILS antennas, VORs and NDBs. In addition to the restriction to keep crops back more than 250 feet from the runway centerline, the glide slope antenna for the ILS has an area that requires protection. This area extends from 50 feet behind the glide slope antenna to 800 feet in front of the antenna and from the runway to 100 feet beyond the antenna. Crops must be kept back 100 feet from a VOR and 50 feet from a NDB. In addition, there should be no deep tilling within 500 feet of the NDB to protect the ground plane that is installed around the NDB. Crops must also be kept back 100 feet from automated weather stations.

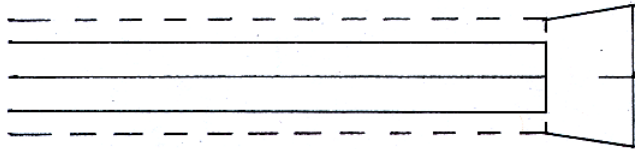
In addition to the issues addressed above, airports also need to be concerned with how the farming will affect drainage at the airport. The operator should also ensure that the types of crops do not bring additional wildlife to the airports, especially geese and deer.

Even well written leases need to be monitored. Farmers have a tendency to try to get one more row every time they plant. A wise administrator will leave a buffer zone between the protected airport surfaces and the beginning of the property being leased. In cases where the owner has shown that they are unable to protect these minimum surfaces the State may require a larger area as a condition of licensing.

# Typical Prohibited Areas for Agricultural Operations at Minnesota Airports

## Turf Runway with Visual Approaches

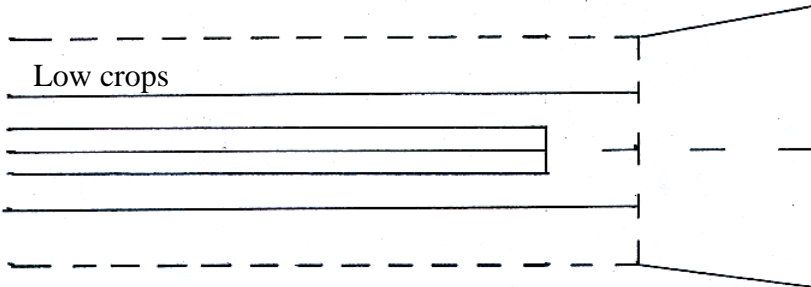
**Primary Surface** 250' wide



**Approach Surface**  
250 to 310 feet wide  
0 to 200 feet from runway end

## Paved Runway with a Non-precision Approach

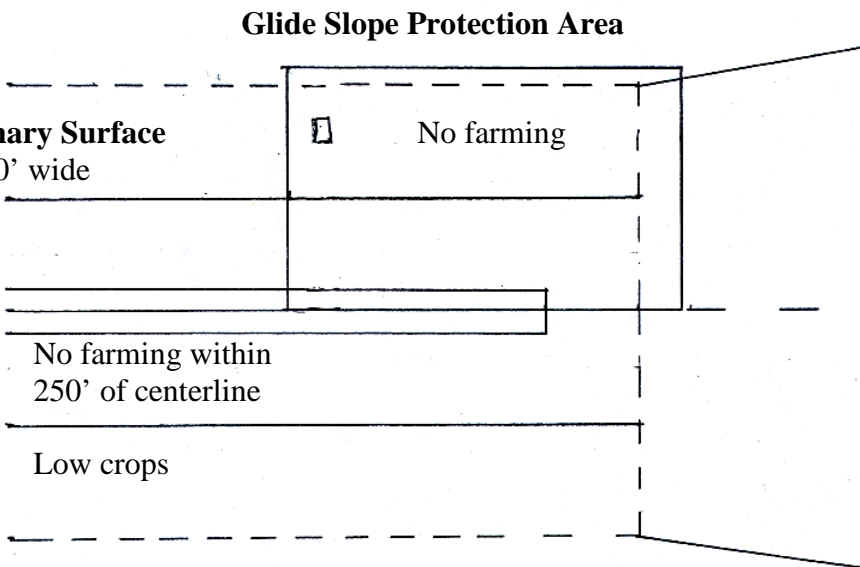
**Primary Surface**  
500' wide, no farming within 125' of centerline



**Approach Surface**  
500 to 620 feet wide  
200 to 600 feet from runway

## Paved Runway with a Precision Approach

**Primary Surface**  
1,000' wide



**Approach Surface**  
1,000' to 1,150' wide  
200' to 700' from end