

**December 20, 2023**

## **Application Note: Enhancing Hay Quality for Farmers Using An Artificial Dew System (ADS) During the Raking Process**

### **Background:**

Farmers in the hay production industry face the challenge of maintaining hay quality during the raking process. This is where multiple rows of hay are gathered into a single windrow, preparing it for baling. While essential for efficiency, this process often leads to leaf loss as the mechanical action of moving the windrow dislodges leaves from the stems. This problem is especially pronounced in dry conditions when the hay is under 35 percent moisture. The optimum moisture content for raking is 35 – 40 percent. When raking at 20 percent moisture content, 21 percent of the leaves are lost as compared to raking at 50 percent moisture when only 5 percent are lost (Rotz, 1993). Many farmers currently rely on natural dew to maintain moisture levels. This approach can be unpredictable due to the speed and location that the dew sets in or burns off at. The moisture you start raking at is generally not the same moisture you end raking at. This results in quality differences across the field as well as production inefficiencies.

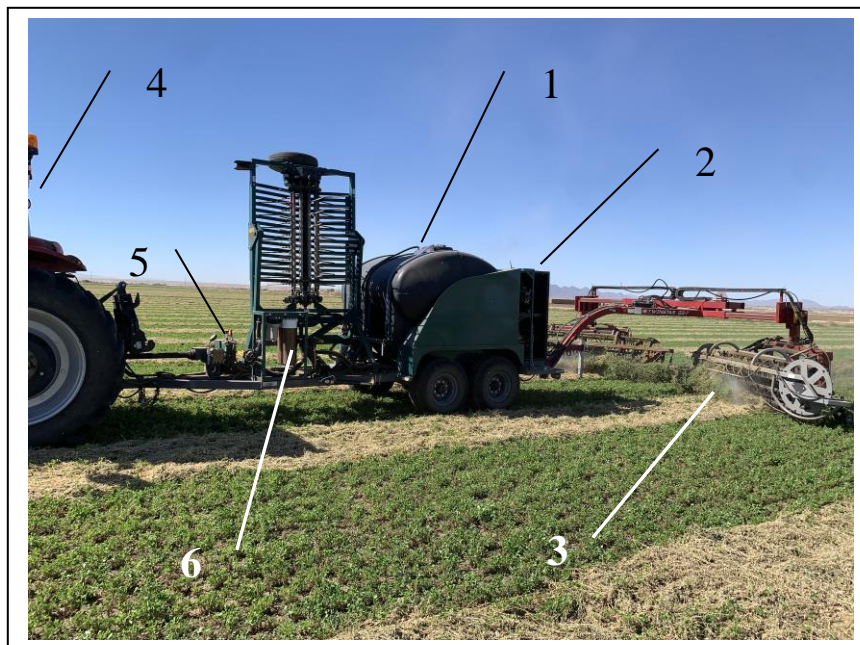
Harvest Tec's Artificial Dew System (ADS) introduces a high-temperature water mist or steam to the windrow of hay, both before and during the raking process. This innovation rapidly softens the plant material, preserving leaf attachment during the raking process. This offers farmers greater control over leaf shatter, enhancing the quality of hay, and efficiency in their operation.

### **About the Artificial Dew System (ADS)**

Harvest Tec's system is designed with the practicality of farmers in mind, aiming to seamlessly integrate into existing hay production processes. Key components of the system include:

- 1. Mobile Water Tank:** This component is positioned between the tractor and the rake to ensure easy maneuverability across the field.
- 2. Heating Equipment:** The heating equipment uses two on demand diesel fired water heaters that ensure that water is applied at the correct temperature based on flow of water needed.
- 3. Distribution Manifold Attached to the Rake:** The distribution manifold is intricately linked to the rake and efficiently administers moisture to the windrow of hay during raking. This component ensures uniform and efficient coverage, minimizing leaf detachment.

4. **Controls and Sensors:** The system incorporates cab-mounted controls and onboard sensors that monitor water temperature and water flow. These can be easily adjusted on the go for changing field conditions.
5. **PTO Driven Pump:** A 1000 RPM piston pump delivers an adjustable flow of water to the heaters ensuring that the correct amount of water is heated and applied.
6. **Filtration System:** The multistep filtration system filters out impurities to allow clean water to be applied to the crop and prevents plugging within the system.



### **Field Results of the Artificial Dew System (ADS)**

The system was tested on three farms in different haying conditions in the western United States during the 2023 season. On September 6<sup>th</sup> in Greely, CO using a Darf wheel rake. Blythe, CA on October 5<sup>th</sup> using a Twinstar bar rake, and Hope, NM on November 6<sup>th</sup> using a Darf wheel rake. Tests were done with and without artificial dew. We measured our results by evaluating the amount of leaves on the ground under the raked windrow.

Our results are displayed in the following pictures. Figure 1 is raked without artificial dew. Figure 2 is raked with artificial dew.





Figure 1 - Picture shows many leaves left on the ground under the raked windrow without artificial dew.





Figure 2 - Picture shows minimal leaves left on ground under raked windrow using artificial dew.

## **Conclusion**

We have demonstrated that the Harvest Tec's Artificial Dew System when utilized during the raking process can dramatically improve leaf retention. This simple effective system not only allows farmers to regain control over their schedules, optimize their operations, and ultimately improve their bottom line, it also gains back countless hours that have been wasted on waiting for natural dew.

## **References**

- Rotz, C.A. 1993. An evaluation of hay drying and harvesting systems. Proceedings, 23<sup>rd</sup> California Alfalfa Symposium, 39-48 December 7-8, Visalia, Ca.
- Orloff, S.B. 1988. Artificial dew to improve baling: Can you beat mother nature? Proceedings, 18<sup>th</sup> California Alfalfa Symposium, 137-43. December 7-8, Modesto, Ca.