Equipment for selective application of herbicides to control waxy leaf nightshade (Solanum glaucophyllum)o

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Other participants: EEST N°1 Delfor Del Valle school, Municipality of Dolores and Sociedad Rural de Dolores.

Statement of problem:

In the Salado River Basin, the accidental consumption of fallen Solanum glaucophyllum leaves is the cause of enzootic calcinosis, a serious disease in bovine cattle. It causes impairments in vitamin D absorption, producing calcium depositions in muscle tissues and joints. Enzootic calcinosis constitutes a problem for livestock breeding in an area spanning approximately 1,920,000 hectares in the Salado River Basin, but cases have been reported in other regions of the country.

High – The application technology has been validated in pasturelands in the Salado River Basin by multiple field assays, with very good outcomes. However, the equipment employed originally is limited for this use, since it requires a tractor, has low operating capacity and is difficult to set up and move, which make it costly to acquire and renders the tractor unavailable for other uses.

Presently, we are working on a new enhanced prototype that does not require a tractor. It is easy to set up and use. Additionally, it features a novel system that triggers the roller wetting function. It is actuated when it meets weeds and delivers the product only in the area where weeds are present. This is an electronic, battery and solar cell-operated mechanism. This new prototype has been completed and is undergoing testing and improvements. No difficulties have been detected regarding its use and adjustment, and breakage and maintenance requirements are remarkably few. **Technology Readiness Level:** Machinery with land impact

Technology proposal:

Relying on validated equipment for selective herbicide application that enables to manage lots affected by waxy leaf nightshade issues, thus reducing the incidence of enzootic calcinosis. Improving the use of natural pasturelands.

A selective application device has been developed. It is a padded roller featuring four meters working width, mounted on the front of the tractor and rotating in the opposite direction of travel powered by a motor. A boom continuously sprays the herbicide mix on the roller and applies it when the roller meets weeds. Thus, the mix is directly delivered on the waxy leaf nightshade, without affecting the pasture. This application method offers substantial advantages: it is economical because it uses a small amount of product; it is environmentally sustainable because it only meets the target weeds, with very little spillover; and from the operating standpoint, it is not hindered by wind conditions.

Development requirements (testing, scale-up production, investment, etc.):

In order to fulfill this new development we require field tests, dose adjustments, material strength tests, assays under different weather conditions, herbicide usage tests and general adjustments. Subsequently, investment will be required for scaling and marketing purposes.