

STUDY ON THE ESTABLISHMENT AND EVALUATION OF CACTUS VARIETY IN CONDITIONS OF OKARA AT LIVESTOCK PRODUCTION RESEARCH INSTITUTE BAHADURNAGAR

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ABSTRACT: A field study was carried out to investigate the establishment of cactus variety and its evaluation as fodder for livestock under climatic conditions of Okara at Livestock Production Research Institute Bahadurnagar (Okara) during 2015-16. Under this study the pads of cactus variety was grown during February 2015. During April 2015, its survival percentage was counted i.e. 85%. On an average bases Pad yield per plant was measured which was 0.25 tons/plant. Plant samples (Pads) were collected during April 2015 & January 2016 for quality analyses i.e. Dry matter %, Crude Protein, Crude Fiber, Ash and ether Extract%. It was found that the cactus variety yield 90% moisture contents, 10% dry matter, 22% total minerals, 8% crude protein and 4% ether Extract.

Key words: Survival %, Pad yield, proximate composition.

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INTRODUCTION

Opuntias species are known as cactus pear, which includes numerous species of the opuntia genus, all of them from the Americas. Cactus opuntias (cactus pear) are terrestrial cacti, showing multiple segmented stems with cylindrical, globose or flattened stem segments and spiniferous areoles, which are not restricted to ribs, but regularly arranged on the whole stem surface, partly on low tubercles and which bear spines and glochids Switzerland (2001). The family cactaceae are an exciting and challenging group of plants because of their varied morphology and succulence, their showy flowers, their adaptations to the environment, and their reproductive strategies. The subfamily opuntioideae is native to North and South America from Southern Canada to Patagonia. Various species are introduced in many other regions of the world such as Australia, South Africa, and Madagascar. A number of plantations were established in the middle eighties and are increasing in number Wessels *et al.* (1997). Commercial plantations of spine-less cactus pear are well established and in South Africa, Limpopo Province contains the largest cactus pear plantations for fruit production. Cactus pear fruits are appreciated for their characteristics taste and aroma as well as their dietetic properties. Fruits of different shapes, colours and flavours can be produced from each Cultivar. The juicy pulp contributes 60 – 70% of the total fruit weight and contains hard coated seeds with the pulp weight of 5 – 10% Cantwell (1991). It was also monitored the Survival and development of cactus transplants in urban, disturbed areas of the desert near La Paz, Baja California Sur, Mexico. Young plants of three

species of pachycereid cacti (*Pachycereuspringlei*, *Stenocereusthurberi*, and *Lophocereusschottii*) inoculated with the plant growth promoting bacterium *Azospirillumbrasilense* in an eroded area (a dirt road) had a high survival rate and developed more rapidly compared with uninoculated control plants during a 3.5-year period after transplantation Boshan *et al* (1999). Although South Africa hosts one of the largest germplasm collections of cactus pear in the world limited research into emerging crop has been published Chapman *et al.*, (2002). Several species of desert plants, mainly cacti, grow without soil on rocky cliffs, large rocks, and ancient lava flows in hot desert areas of the Baja California Peninsula of Mexico where weathering is not apparent Boshan *et al.* (2002b, 2006). Therefore, the aim of present study was to establish and evaluate the cactus variety in conditions of Okara at Livestock Production Research Institute Bahadurnagar.

MATERIALS AND METHODS

The pads of cactus were planted at RXR and PXP distance of 1 meter. The crop was sown in Fodder crops Division of Livestock Production Research Institute Bahadurnagar Okara during February 2015. Irrigation was given after two days of planting. The growth position was observed during 1st week of April 2015. During April 2015 and January 2016 the sprouting % was calculated. During April 2015 & January 2016 the Plant samples (Pads) were collected and sent to Livestock Production Support Laboratory Bahadurnagar Okara for quality analyses i.e. Dry matter %, Crude Protein, Crude Fiber, Ash and ether Extract%.

RESULTS AND DISCUSSION

During the 1st week of January 2016, it was observed that all the pads of cactus were surviving. During April, 2015 & January 2016 the sprouting % was observed and it was seen all the pads (100%) had sprouted. Similar results were obtained by the Bashan *et al* (1999) monitored the Survival and development of cactus transplants in urban, disturbed areas of the desert near La Paz, Baja California Sur, Mexico. Young plants of three species of pachycereid cacti (*Pachycereuspringlei*, *Stenocereusthurberi*, and *Lophocereusschottii*) inoculated with the plant growth promoting bacterium *Azospirillumbrasilense* in an eroded area (a dirt road) had a high survival rate and developed more rapidly compared with uninoculated control plants during a 3.5-year period after transplantation.

During the month of April, 2015 & January, 2016, the pad yield was calculated and it was found that each plant produced 0.25 tons of pads per annum. The quality of pads was determined in the laboratory i.e. table -1.

Table 1. Quality of Pads of Cactus

Sr. No.	Parameters	Quantity (%)
1	Dry Matter	10
2	Total minerals	22
3	Moisture	90
4	Crude protein	8
5	Ether extract	4

Prickly pear is still an important emergency feed resource for ranchers in South Texas for both beef cows and stockers. However, the nutrient content of prickly pear is often less than that required by any animal other than a dry or early bred beef cow. Griffiths (1905) review of management practices utilizing prickly pear in South Texas at the turn of the century is interesting but given today's levels of beef, dairy, swine, and horse production in the United States, it is doubtful that prickly pear has a significant place in modern feed rations. However, there is still a need for nutritional and feeding information which could be very useful in areas or countries with less intensive methods of livestock production. Prickly pear is very high in moisture content (but consequently low in dry matter). As a result, it often takes very large amounts of prickly pear (100—200 lbs per A.U. daily) to satisfy minimal nutrient requirements. This high level of water in the diet increases the rate of passage through the digestive system and leads to the scouring often seen in cattle fed singed prickly pear. This increased rate of passage also reduces nutrient absorption. It is always advisable to feed some hay or have a dry pasture that the cattle can utilize to increase the level of dry matter intake.

This will reduce the incidence of pear fiber balls in the rumen caused by high levels of crude fiber. Cattle may appear to bloat on prickly pear but a more likely cause is the distension of the rumen from the large amounts consumed. Crude and digestible protein levels are generally low in prickly pear, especially when fed on the plant "as is" or after singeing. Prickly pear is generally too low in crude protein to adequately maintain a dry pregnant cow except during early spring growth. As a result, it is always recommended that a good protein supplement be added to the diet of cattle fed prickly pear. Additional supplemental protein also reduces the incidence of pear or fiber balls in the rumen by increasing fiber digestibility. A non- protein nitrogen source might be utilized in a prickly pear ration. Further studies are needed in this area as well. Fortunately, prickly pear is moderately high in energy. Energy levels vary, depending again on source of material. Since energy is often the first limiting nutrient on rangeland, is needed in the greatest amount, and has a significant effect on reproduction, prickly pear should be considered as a "good feed", albeit a slightly unbalanced one. Prickly pear is generally very high in fiber and ash, both of which are responsible for digestive upsets. As stated, the large amount of indigestible fiber often causes "fiber" or "pear balls". The high ash content most likely aggravates the scours as a laxative effect. This appears to be as a result of the high levels of magnesium, potassium, and sodium salts in prickly pear. The problem of scours can be reduced by increasing dry matter intake with lower quality feedstuffs such as cottonseed hulls, hay, and brush pasture.

The species planted was thorn less and was found that the animals could graze to some extent. The results are in line of the findings of Wayne and Paschal (1991) who reported that many wildlife species, particularly in South Texas, depend upon prickly pear for food, water, and cover. Studies have shown that up to 21% of the annual diet of white-tailed deer is prickly pear cactus. Prickly pear pads also comprise the bulk of the diet of the javelina. Prickly pear is also rated as an important food and cover plant in South Texas for Northern bobwhite quail. The seeds are high in nutrition, productivity, and palatability as a quail food. However, the plant doesn't provide much shade and has only moderate value as a headquarters cover. Prickly pear patches are excellent for travel and escape cover from predators. Many other species of birds and mammals also use the prickly pear as food or cover. Prickly pears are also food-producing cacti for humans. The tunas are large, sweet fruits that are eaten raw, prepared as jelly, or candied. The young, tender pads, called "nopalitos", are eaten in salads and omelets, or as a garnish. Domestic production, at the present, is relatively small and large amounts of nopalitos and tunas are imported into the U.S. annually. Livestock throughout South Texas, Mexico, and Central and South America are often fed prickly pear either as a primary

sustenance food or an emergency feedstuff. Feeding prickly pear, however, has several disadvantages. "Pear eaters" may result from feeding livestock singed pear, as the livestock may continue to eat prickly pear with spines after "burning" has stopped. This can result in external

and internal injuries causing the animals to remain in poor condition throughout the year. Death losses were high from these injuries during screwworm outbreaks. Livestock may also tear off pads and scatter them over the pasture, spreading the plant.



Picture:-1 & 2 :- Grazing of Cactus by teddy goats at LPRI, Bahadurnagar (Okara)

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