

**International Center for Agricultural Research
in the Dry Areas
ICARDA**



**Regional Symposium on:
Integrated Crop-Livestock Systems in
the Dry Areas
of West Asia and North Africa**

6 - 8 November 1995
Amman , Jordan

Abstracts

IFAD



*International Fund for
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About ICARDA

Established in 1977, the International Center for Agricultural Research in the Dry Areas (ICARDA) is governed by an independent Board of Trustees. Based at Aleppo, Syria, it is one of 16 centers supported by the Consultative Group on International Agricultural Research (CGIAR), which is an international group of representatives of donor agencies, eminent agricultural scientists, and institutional administrators from developed and developing countries who guide and support its work.

The CGIAR seeks to enhance and sustain food production and, at the same time, improve socioeconomic conditions of people, through strengthening national research systems in developing countries.

ICARDA's mission is to meet the challenge posed by a harsh, stressful and variable environment in which the productivity of winter rainfed agricultural systems must be increased to higher sustainable levels, in which soil degradation must be arrested and possible reversed, and in which the quality of the environment needs to be assured. ICARDA meets this challenge through research, training and dissemination of information in a mature partnership with the national agricultural research and development systems.

The Center has a world responsibility for the improvement of barley, lentil, and faba bean, and a regional responsibility in West Asia and North Africa for the improvements of wheat, chickpea, forage and pasture - with emphasis on rangeland improvement and small ruminant management and nutrition - and of the farming systems associated with these crops.

The results of research are transferred through ICARDA's cooperation with national and regional research institutions, with universities and ministries of agriculture, and through the technical assistance and training that the Center provides. A range of training programs is offered extending from residential courses for groups to advanced research opportunities for individuals. These efforts are supported by seminars, publications, and specialized information services.

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Crop- Livestock Integration
Session 1 & 2

Agro-Pastoral Systems, Feed Calendars and Feed Resources in the Arab Countries of the Mediterranean Region

G. Gintzburger, T. Nordblom and A. Osman

ICARDA, Aleppo, Syria

Abstract

The pastoral societies of the Arab World have displayed a fast evolution in the recent past after centuries of stable equilibrium. They survived in spite of fluctuating feed and fodder resources hinging on seasonal rainfalls, always highly variable within and between years, and between regions. Natural feed production is highly variable and regulates the animal population on rangelands. The answer to this challenge was to keep migrating (nomadism and transhumance) from one range vegetation type to another. Little contact occurred with the neighboring cropped lands in wetter areas. Each group lived in autarchy. In arid zones, famines, raids, epidemics acted as regulating mechanisms on natural resources for feed and fuel. Stocking rates were close to four ha/sheep. Increasing demographic pressure and its devastating consequences on natural resources have altered the antiquated equilibrium. Rangeland feed availability has dwindled, forcing nomadic groups to find other means to feed their flocks. Isolated pastoralists have had to move towards another system, seeking alliance with farmers.

After reviewing and describing the worsening steppe condition and deciphering the trends of livestock and feed in Arab countries, the authors make a pledge for rangeland-cropping zone integration whereby the farmer is the breeding base while the latter is becoming the fattening ground.

A Novel Participative Approach for Management and Rehabilitation of Village Common Pastures in the Central Highlands of Turkey

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Abstract

Over the last 50 years cereal production has replaced most of the common pastures of the Central Highlands of Turkey (CHT). Moreover, mismanagement of the existing common pastures, i.e., early grazing and overstocking of animals, has resulted in severe destruction and degradation of pasture species. In the past, on-farm trials and demonstrations have been conducted on the common rangelands of the CHT. However, adoption by farmers of the research results was rather difficult. The new dimension in this study is its multidisciplinary approach, consisting of attention to socio-economic aspects, improvement of the village-based feed resources, and rational livestock feeding. Likewise, participation of extension agents and farmers is an essential component. The results of a survey village leaders (mukhtars) and a biodiversity study on the common pasture species are presented herein.

Performance of Awassi Lambs Grazing Common Vetch in On-Farm and On-Station Trials.

F. Bahhady, S. Christiansen, H. Harris and E. Thomson
ICARDA, Aleppo, Syria

Abstract

Lamb fattening trials on common vetch (*Vicia sativa*) were conducted on the ICARDA research station from 1986/87 to 1992/93. The objective of the trials was to introduce legume crop rotations into wheat- or barley-based farming systems in northwest Syria and also to study the use of vetch as a lamb fattening crop. The goal was to fatten newly-weaned lambs on vetch until they could be sold at an age of about five months, when they weighed between 30 and 35 kg. The El Bab on-farm trials lasted for seven years, a period in which annual rainfall averaged 266 mm. Grazed vetch supplied the feed needs of 33 lambs/ha for 33 days/yr, with average daily gains of 186 g, or a liveweight production of 194 kg/ha. Lambs were also given 300 g/day of barley at El Bab, but on the research station no supplement was fed. On-station, the average rainfall was 321 mm per year; 32 lambs/ha grazed vetch for an average of 46 days/yr; lambs realized an average daily gain of 205 g, or a liveweight production of 295 kg/ha. Lamb fattening as an on-farm practice provides several benefits. Vetch adds nitrogen and organic matter to the soil and gives farmer a solution to the problems of growing cereal monocultures. This solution is more profitable than a barley crop, avoids the expense and logistical difficulties of mechanically harvesting vetch and, because the vetch is grazed when green, saves some water in the profile for the subsequent cereal crop.

Justification for Integrated Farming in the Dry Areas: Application in Farmers' Fields

Bassam Mawlawi

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Abstract

Continuous barley monocropping is rapidly depleting soil fertility. Likewise, simultaneous build-up of pests and diseases indicate that barley yields in this systems are declining.

The integrated system (cereal/forage/pasture/sheep) is a solution to overcome the increasing shortage of feed. The integrated system is a means to integrate livestock, forage, pasture and cereal production in a way that improves soil fertility. Within this system, weeds and diseases are easy to control. It is a sustainable system that allows for increased livestock and crop production. In cooperation with ICARDA, many scientists have conducted research to study the possibility of applying the integrated system on farmers' fields. Yes despite the success achieved in some locations and at different levels, the application of the integrated system still faces many constraints, including:

- (1) Scattering of small holding size;
- (2) flock size;
- (3) poor grazing management (which is affected by farm and flock size and the ability of farmers to keep more than one flock);
- (4) marketing;
- (5) absence of qualified extension staff;
- (6) government policy;
- (7) traditional feeding systems.

Furthermore, the system requires at least three years to ascertain its viability.

The Importance of Forage Legume in Crop Rotation

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Abstract

Multiple-location on-farm trials were conducted over three seasons (1989-1992) to introduce forage legumes in crop-rotation with barley, to integrate crop and livestock, to replace fallow, to increase barley productivity and provide green feed to sheep in dry areas.

The results indicate barley yield increased after rotation with forage legumes by about 19-28 percent over barley/barley (B/B) or barley/fallow (B/F). This means forage legumes become an economic alternative to fallow and provides green feed to improve the livestock production (13 tons G/M, 4.5 tons D/M from *Vicia sativa*; 10 tons G/M 2.9, tons D/M from lathyrus; and 11 tons G/M, 3.25 tons D/M from *Vicia erivelii*).

This system provides high quality green forage to sheep grazing or hay to meet livestock requirements throughout winter. It also increases grain cereal yields as a result of increased fertility. This system represents a socio-economic improvement for farmers.

أهمية البقوليات العلفية في الدورة الزراعية

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مديرية البحوث العلمية الزراعية - دوما - سوريا

الملخص

أجريت خلال السنوات ١٩٨٩-١٩٩٢ مشاهدات في حقول المزارعين بهدف ادخال البقوليات العلفية في الدورة الزراعية مع الشعير لايجاد نظام زراعي متكامل للانتاج النباتي والحيواني للقضاء على البور وزيادة انتاج الشعير وتأمين الاعلاف الخضراء للأغنام أثناء ندرتها في المناطق الجافة.

اشارت النتائج الى تفوق إنتاج الشعير في تناوب مع البقوليات العلفية وبمحدود ١٩-٢٨٪ زيادة عن إنتاج الشعير بعد شعير أو بعد بور مما يجعل نظام بقوليات/ شعير بديلاً إقتصادياً مهماً عن التبنير يضمن توفير أعلاف خضراء لتنمية الثروة الحيوانية (١٣ طن مادة خضراء و ٤,٥ طن مادة جافة من البيقية العلفية و ١٠ طن مادة خضراء و ٢,٩ طن مادة جافة من الجلبان و ١١ طن مادة خضراء و ٣,٢٥ طن مادة جافة من الكرستة).

وهكذا فإن هذا النظام يضمن توفير كميات كافية من الأعلاف الخضراء لرعي الأغنام أو تحفظ كدريس لمواجهة متطلبات الثروة الحيوانية خلال فصل الشتاء، بالإضافة الى تحقيق زيادة أكيدة في إنتاج الحبوب المزروعة في أعقاب تلك البقوليات وذلك بسبب الأثر الخصوبي الذي تتركه الأعلاف الخضراء.

كما يمثل هذا النظام تطوراً إقتصادياً وإجتماعياً يتيح للمزارع استغلال الارض سنوياً بدلاً من استغلالها كل سنتين.

Effect of Planting Method and Crop Rotation on Rainfed Barley Productivity in Zone Three (Hasakeh)

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Abstract

Barley is the principal crop in semi-arid areas. It tolerates soil salinity and low moisture where other crops such as wheat would fail.

This study was conducted to determine the most productive method to grow rainfed barley. The study was initiated during 1992-93.

Crop rotations of barley/barley, fallow/barley, Bekia/barley and lathyrus/barley were studied, in combination with the following three sowing methods:

1. Harrow seed drill
2. Row seed drill (Kashashian)
3. Direct planting in dry soil

The split-plot design was used.

The results indicate that differences between rotations were significant, with fallow/barley being the most promising. No differences were detected between planting methods.

أثر طرق الزراعة والدورات الزراعية على انتاجية الشعير البعل في منطقة الاستقرار الثالثة (الحسكة)

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الملخص

يعتبر الشعير محصولاً هاماً في المناطق شبه الجافة ويتميز بانه ينمو في المناطق متدنية الامطار ويتحمل الملوحة حيث تفشل زراعة محاصيل اخرى كالقمح. اجريت دراسة تهدف لايجاد الطريقة المثلى لزراعة الشعير البعل والتي تعطي أعلى انتاج. في الفترة من ١٩٩٢ - ١٩٩٣ ولا زالت الدراسة مستمرة ونفذت الدراسة بالتعاون مع ايكاردا .

الدورات الزراعية المنفذة فهي شعير/شعير ، شعير/بور ، شعير/بيقية و شعير/جلبان

المعاملات الزراعية: ١- الزراعة بواسطة بذارة الهارو

٢- الزراعة بواسطة البذارة المحلية (كششيان) حيث تزرع في خطوط

٣- الزراعة مباشرة بالتربة بدون حراثة مسبقة (الزراعة على الجلد)

استعمل تصميم القطع المنشقة مع توزيع الدورات عشوائياً. اما الاصناف المستعملة فهي: شعير عربي اسود بيقية رعوية محلية جلبان رعوي محلي.

أظهرت الدراسة وجود فروقات معنوية على مستوى ٥٪ بين الدورات المنفذة وكانت افضل الدورات هي شعير/بور واقل فرق معنوي ١٢٦ كغم/هكتار.

أما بالنسبة للمعاملات (الاليات المستخدمة في الزراعة) فلم تظهر هناك فروقات معنوية بينها

Preliminary Economic Analysis of Medic Pasture and Other Dryland Crops in Two-Year Rotations With Wheat in Northeast Syria

**F. Shomo, S. Nasser, G. Malkei, F. Bahhady, S. Christiansen,
D. Pannell and T. Nordblom**
ICARDA, Aleppo, Syria

Abstract

This paper compares the economic role of annual medic pasture in rotation with wheat and other crop rotations with wheat (fallow, lentil, vetch, wheat) in the dryland farming environment of northeastern Syria, based on analysis of eight years of agronomic and market data. A whole-farm model captures the key complexities and interactions among crop, pasture and livestock activities, prices, labor availability, and household requirements.

Results indicate a positive but limited role for annual medic pasture in northeastern Syria. The role is one of providing an economical commodity. Prices and farm wages are shown.

Introducing the Ley-Farming System in Western Libya: An Arid Mediterranean Environment

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Abstract

Libya covers some 175 million hectares, out of which 98.7 percent is Sahara desert and rangeland with average annual rainfall largely below 150 mm. Total arable land is around 2.3 million hectares of which half is cultivated each year. Two-thirds and one third lie in the Northwestern and Eastern regions, respectively.

Since the early 70s, Libyan oil money was intensively channeled towards agriculture in an effort to reach food self-sufficiency for the whole country. Various development projects on rangelands, forestry and most important on cereal cultivation were established. More specifically, particular emphasis was placed on cereal cultivation and meat production. Although approximately 115,000 ha were irrigated (1974 season), with an average production of 0.3 tonnes wheat/ha and 0.6 tonnes barley/ha under rainfed conditions, Libyan agriculture could not satisfy national requirements. Furthermore, demand for local meat increased significantly as Libyans became more wealthy.

Within the Ministry of Agriculture and Land Reclamation, two Regional Executive Authorities, respectively in charge of agricultural development of the Jeffara and the Jebel El-Akhdar regions, decided to tackle cereal and sheep production using an integrated approach. In 1973, Libya invited Australian expertise to develop the ley-farming system in Western and Eastern Libya where rainfed cereal cultivation could reasonably be improved in association with sheep husbandry.

This new system for Libya had to be adjusted to lower rainfall zones (175-250 mm/year) than in Australia. Land development on sandy rangelands faced technical and some social problems with local agro-pastoralists.

This paper reviews the early establishment of the ley-farming system in the Jeffara plain and the attempt to integrate the small ruminant component in a new farming system for the region.

Using Medics for Nearly Three Decades of Attempts to Introduce Ley Farming in Tunisia

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Abstract

Annual medics have been used for nearly three decades of extension efforts to introduce ley farming in Tunisia.

This was expected to be used on more than 300 000 ha potentially suitable for medic/cereals rotation and 500 000 ha of marginal and rangelands improvement. However, using medics for ley farming in Tunisia did not exceed 8000 ha in most favorable conditions and years.

The main constraints which limited the extension of ley farming in Tunisia were poor performance of medic cultivars developed and imported from Australia, inappropriate tillage methods and implements, weed control and inadequate grazing management. In addition to high prices of Australian imported medic seeds and the lack of a true approach of integrated crop-livestock system to valorize the use of medics also contributed to limiting ley farming use in Tunisia.

Although ley farming is economically feasible and can be adapted to socio ecologically favorable areas in Tunisia, the lack of Tunisian farmers adoption of this system raised the question of adopted technology transfer. Modification of the system is needed to suite Tunisian farmer conditions.

Successful ley farming requires the management of the medic-cereal system as a farming system that integrates both cereals and livestock on the farm rather than attempts of using medics to replace a year of fallow.

Investigation on Forage Alternatives Following Wheat Harvest Under Rainfed Conditions of Central Anatolia

Mehmet Munzur' and Hüseyin Kabakçı'

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Abstract

A two-year wheat-fallow rotation system has been used in the Central Anatolia to overcome a water deficit in the wheat year. However, research in the past indicated that fallow could be replaced with legumes, particularly with those annual forage crops that are grown for hay production. Since forage crops have low hay yields when grown as sole crops, cereal-forage mixtures need to be tested to improve dry matter production. The present study was conducted to determine hay and crude protein yields of cereal-vetch mixtures under the rainfed conditions of Central Anatolia. Barley (*Hordeum vulgare* L.), rye (*Secale cereale* L.), Hungarian vetch (*Vicia pannonica* Crantz.) and wooly-pod vetch (*Vicia villosa* Roth.) were grown alone and in combination with each other in different seed compositions following barley harvest. Overall, higher hay yields were obtained from all treatments in the 79/80 crop season than in the 80/81 crop season. Cereals grown alone produced 20 and 46 percent and vetches 52 and 28 percent lower hay and crude protein yields than the crops grown as mixtures, respectively. Increasing the ratio of cereals in the mixtures increased hay yield but not crude protein yield. Cereal and vetch mixtures for hay production seemed to be better alternative feed sources than vetches grown alone. Higher crude protein content and hay yields from mixtures could be explained by a positive association between vetches and cereals and by readily available N forms fixed by vetches for cereal usage.

Barley and Forage legume Improvement & Management
Session 3, 4, 5 & 6

Detection of DNA Polymorphisms in a Number of Barley (*Hordeum Vulgare L.*) Varieties

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IPA Agricultural Research Center, Baghdad, Iraq

Abstract

The aim of these investigations was to detect naturally occurring polymorphisms at DNA level in six barley varieties/lines (California Mariout, Numar, IPA-2, IPA-7, IPA-99 and IPA-265).

For this purpose, first a number of DNA clones were prepared. This was achieved by the insertion of mainly single copy barley genomic DNA fragments into the Hind site of the plasmid PGEM-7Zf (-) vector. An efficient (10^5 cfu) bacterial transformation system was developed using the bacteria *E. coli* strain XLI-Blue. Recombinant clones were identified by means of two selectable markers (ampicillin resistance and colony color) encoded by the plasmid vector.

Also in this work, we adopted a non-radioactive methodology of labeling barley clones with Digoxigenine. The labelled probes were then hybridized to barley genomic DNAs transferred onto MS1 membranes after complete digestion with PstI and TaqI restriction enzymes, followed by immunological detection.

The preliminary results showed the feasibility of employing such techniques in our laboratory, and they have revealed a good degree of polymorphisms between barley varieties tested.

Further investigations are undergoing to master such techniques.

Screening Barley (*Hordeum vulgare* L.) Genotypes for Salinity Tolerance Under Naturally Salinized Fields Conditions

A. M. Al-Shamma, B. A. Al-Rawi and S. Saeed
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Abstract

An experiment was conducted at two locations; Fudalia (30 km southeast of Baghdad) and Dalmaj, Wasit Province (180 km south of Baghdad) for two consecutive growing seasons, 1984-1985 and 1985-1986. The aim was to devise a screening methodology, to test barely genotypes for salinity tolerance in naturally salinized fields. The screening test is based on planting frequent checks alternated with the cultivar under study. Six barley cultivars namely, CM-67, Numar, Prior, Clipper, Weeah and Arivat, were used in addition to the check cultivar "California Mariout." Plot size was 3.2 x 4 meters. Plots were seeded at a rate of 100 kg/ha in rows spaced at 20 cm apart. Fertilizer NPK 18:18:18 was applied at a rate of 100 kg/ha. The set up of the experiment was a randomized complete block design with three replications.

Results showed non-significant differences between the check cultivar and each of the cultivars CM-67 and Numar in terms of grain yield and other characteristics in the two locations and throughout the two seasons. On the other hand, differences between the check cultivar and the rest of the cultivars were significant with respect to all studied characteristics in most environments (seasons and locations). Reduction in yield under saline environments appears to be due mainly to the decreased number of kernels per head. Relationships among the various characteristics and their consistency under salinity were discussed.

Pathological and Entomological Problems in Barley in Syria

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Abstract

Following field surveys (89/90-94/95) for pathological and entomological infections on barley in Al-Hassaka, Raqqa, Hamah, and Daraa regions, the following conclusions were reached:

There were variances in distribution of barley diseases and insects from area to area, while the powdery mildew was common in all regions. Susceptibility of barley varieties to *Rhynchosporium* scald and *Helminthosporium* leaf blotch in the same area was different.

Ground Pearls were the most harmful barley pest, followed by Thrips in Raqqa and Al-Hassaka. As a result of continuous barley monoculture, Ground Pearls, *Rhynchosporium* scald, powdery mildew and brown leaf blotch infections are increasing. Infection ratios and severities decreased after fallow.

The *Rhynchosporium* scald and *Ascochyta* blight were reduced by application of fertilizer (2-3 times) in adequate amounts. The effect on powdery mildew was contradictory.

المشاكل المرضية والحشرية على محصول الشعير في سوريا

صلاح الشعبي

مديرية البحوث العلمية الزراعية - دوما - سوريا

الملخص

نتيجة المسح الحقلّي للإصابات المرضية والحشرية على محصول الشعير في محافظات الحسكة والرقّة وحماه ودرا خلال المواسم ٩٠/٨٩ - ٩٥/٩٤ فقد توصلنا إلى النتائج التالية: التوزيع المتباين للأمراض والحشرات في مناطق زراعة الشعير في محافظات الحسكة والرقّة وحماه، بينما ينتشر البياض الدقيقي في معظم المناطق بغض النظر عن حساسية الصنف المزروع. تباين حساسية أصناف الشعير تجاه الأمراض كالرينكوسبوروز والهلتمزوسبوروز، في المنطقة الواحدة.

يعتبر البق الدقيقي من أكثر الحشرات ضرراً بمحصول الشعير في محافظات الرقة والحسكة ويليه من حيث الأهمية التربس.

أدت زراعة الشعير عاماً بعد آخر إلى زيادة نسبة إصابته بالبق الدقيقي وسفحة الرينكوسبوروز والبياض الدقيقي والتبقع البني، في حين خفض التبورير نسب الإصابات وشددتها. إن إضافة الأسمدة كحزمة متوازنة على دفعتين أو ثلاث قد خفضت من إصابة نباتات الشعير بالأمراض كسفحة الرينكوسبوروز والاسكوكيتا، بينما كانت النتائج متضاربة تجاه مرض البياض الدقيقي في الأرض المسمدة وغير المسمدة.

The Phenomena of Empty Barley Spikes in Some Areas of Aleppo Province in Syria

Abdel Razzak Doksi

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Abstract

The phenomena of empty barley spikes was observed in 1988 in Jerablus, Al-Bab and Manbaj areas on Arabi Aswad, the local barley cultivar. The symptoms in the field started at seedling stage as yellow rows. These rows are located on the straw left by combine harvesters during the previous year's harvest. The yellow rows then developed into a black at maturity. The spike subsequently becomes fragile and empty.

It was found that a nematode of sub sp. *Anguina* infected barley grains. The nematodes also affected the leaf and stem of the plant. The source of infection is the barley grain and plant debris.

ظاهرة السنابل الفارغة على الشعير المنتشرة في بعض مناطق حلب في سوريا

عبد الرزاق دقسي

مركز البحوث الزراعية - حلب - سوريا

الملخص

بدأت هذه الظاهرة منذ عام ١٩٨٨ في مناطق جرابلس - الباب - منبج على الصنف شعير عربي أسود. وتظهر في الحقل في مرحلة البادرات على شكل خطوط صفراء وهذه الخطوط هي مكان سقوط التبن من الحصاد في الموسم السابق ثم تتطور الى خطوط سوداء أثناء الحصاد وتصبح السنابل في النباتات المصابة ضامرة ورفيعة وطويلة وتبدو وكأنها فارغة.

إن أسباب الإصابة هي نيماتودا تصيب حبوب الشعير وهي من جنس *sub Anguina* *sp* تتجمع داخل الحبة وكذلك داخل أوراق أو عقد على الساق وهي متخصصة بالشعير ولا تصيب القمح. هناك علاقة حساسية بين هذه النيماتودا وحساسية النبات لبعض الأمراض الفطرية مثل التبقع الشبكي المتسبب من فطر *Pernophora Teres*. تنتقل الإصابة عن طريق البذار الملوث وبقايا النبات في التربة.

Ground Pearl on Barley

M. Otba and M. Al-Naif

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Abstract

The ground pearl is an important insect which attacks barley grown in rainfed in Syria's in Zones 3 and 4. They are a particularly acute problem in areas under continuous monoculture. Recently damage from ground pearls has appeared on barley planted in Zone 2.

Ground pearl has one generation per year. The eggs hatched in early January and the larvae start to feed on the plant during the growing season. Adults leave the plant and put their eggs in the soil by the end of April or early May.

The estimated damage to the barley crop ranged from 50 to 80 percent, depending on rainfall.

This study found that a legume/barley rotation in Zone 2 is the most effective way to control the insect. No effective pesticide treatment has been found.

لألىء الأرض على الشعير

محمد عطبة و محمود النائف

مركز البحوث الزراعية - الرقة - سوريا

الملخص

تعتبر هذه الحشرة من الآفات الهامة التي تصيب الشعير المزروع بعلأ في سوريا حيث تنتشر في معظم محافظات القطر مثل حلب، الرقة، دير الزور، الحسكة خاصة في المناطق التي لا تتبع فيها دورة زراعية في مناطق الاستقرار الثالثة والرابعة والتي يزرع فيها الشعير بعد الشعير. وامتدت الاصابة بهذه الافة في السنوات الأخيرة الى مناطق الاستقرار الثانية التي لا يتبع فيها دورة زراعية.

للحشرة جيل واحد في السنة. تفقس البيوض في بداية كانون الثاني، تصعد الحوريات الى النبات وتلتصق به عند منطقة التاج وتبدأ بالتغذية عليه طوال مرحلة النمو وفي نهاية الموسم تغادر الحشرة الكاملة النبات الى التربة، حيث تنسج شرقة تضع فيها البيض في أحر نيسان وأوائل أيار، ثم تموت الحشرة الكاملة. تصل أضرار الاصابة الى تدهور الانتاجية بنسبة تتراوح من ٥٠ - ٨٠ ٪ حسب جفاف الموسم الزراعي

وقد تبين من خلال الدراسة ان الدورة الزراعية بور/ شعير في مناطق الاستقرار الثالثة والرابعة والدورة بقول - شعير في منطقة الاستقرار الثانية كانت جيدة في الحد من انتشار هذه الافة. كما تبين عدم الجدوى من استخدام المبيدات الكيماوية.

Breeding Barley for Hay

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Abstract

Barley is the most successful field crop in the dry and hot climates of West Asia and North Africa. It is used for a variety of purposes, namely grain (feed, food, malt), forage (fed green or as hay), or for grazing at the tillering stage, in the dual purpose farming system (grazing and grain) and continuous grazing (self-regenerating pasture barley).

Hay making becomes increasingly important as the surplus of production in the spring is easily conserved as hay for use in late summer and early winter, when there is a severe scarcity of forage and the sheep and goat are at a critical stage of their life (pregnancy and lambing periods).

A good hay variety must give high dry matter yield, be rich in protein and of high digestibility, must be palatable (to reduce losses at feeding) and it must also produce satisfactory grain yield for low cost seed supply. Very limited research work has been published on breeding barley for hay. Furthermore, the genetics of important traits of hay barley are largely unknown. However, experience gained from breeding grain barley for adaptation to dry climates can be used for breeding barley for hay. Such traits are optimum heading date, stability of tiller number per unit area, increased height, total biological yield, foliar disease resistance and long awns. Smooth-awned varieties are more palatable than rough-awned ones, and breeding in this direction is not difficult. Hooded barley, developed by replacing awns with hoods, is more palatable even than smooth-awned barley. However, the hooded gene has some negative effects on barley, namely it causes reduction in total dry matter yield and especially grain yield. Experimental evidence showed that it is possible to breed for hooded barley, thereby giving the high dry matter and grain yield of awned barley. It was also shown that it is possible to improve both dry matter and grain yield of hay barley.

Genetic Nature of the Principle Yield Components in Barley

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Abstract

A diallel set including eight genetically diverse barley varieties was used to estimate the type and magnitude of gene action involved in the inheritance of the principle yield components in barley. The results pointed out the importance of both additive and non-additive genetic effects in controlling the studied traits. The exception was the number of spikes per plant, which was controlled mainly by dominance effect. The proportion of positive and negative alleles were unequally distributed among the parental populations for the studied traits except for the number of spikes per plant and the number of kernels per spike, which were equally distributed among the studied parents.

The dominance case of inheritance with asymmetrical gene distribution in the genetic background of the parents was detected for most of the characters. The percentage of additive variance (DR.percentage) exceeded appreciably those of dominance (HR percent) for the number of spikes/plant and the number of kernels/spike, particularly in the F_2 generation. Consequently, successful selection for those two characters among early generations is feasible. Estimates of heritability in a narrow sense were moderate for all characters except for the number of spikes/plant and grain yield which showed low estimates. Over dominance and complete dominance cases of inheritance were detected. Completely recessive parents (YR) were higher than completely dominant parents (YD) for the number of spikes/plant, the number of kernels/spike, 1000 kernels weight and grain yield per plant.

Barley Improvement for Feed and Forage Use to Increase Livestock Production

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Abstract

In the continental Mediterranean environments of West/Central Asia and North Africa the predominant farming system is cereal-livestock-pastoralism. During the last 15 years the population in this region has increased from 302 to 426 million (a 41 percent increase), whereas the livestock (milk and meat animals) population has registered a very modest increase of only 4.9 percent during the corresponding period. These figures indicate further aggravation of the shortage of milk and meat in this region unless immediate steps are taken to increase livestock production. Barley cultivation plays a major role in livestock production in the farming system in the countries of this region. Therefore, emphasis is laid on barley germplasm developed at ICARDA. Several NARS have identified better feed and forage quality characteristics and high-yield potential for direct or indirect large-scale use. The availability of more and better feed will greatly help in the promotion of livestock production.

The Future of Landraces

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Abstract

The cultivated barleys in most of the semi-arid regions (SAR) of Tunisia are almost exclusively local cultivars. The productivity of these cultivars is very low, hence there is a need to select for improved agronomic types, and better yields within these populations.

A serious limitation to barley production in the SAR is the narrow genetic base of the new cultivars and their lack of adaptability to the harsh environmental conditions. The exploitation of the existing genetic variability within the landraces will allow researchers to develop stable and adapted varieties that can survive the harsh environmental conditions in the SAR.

The low productivity of the landrace cultivars can be improved by extracting individual cultivars or by crossing them with high yielding lines. Improved landrace cultivars have been tested at different locations in the SAR of Tunisia. A number of selected lines and populations out yielded the local check, Rihane, during both favorable and unfavorable crop seasons.

Introduction and Spread of Rihane 03 in Northern Iraq

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Abstract

Rihane 03 barley cultivar was introduced into Iraq in 1985 through cooperative evaluation of barley lines with the International Center for Agricultural Research in the Dry Areas (ICARDA). During the period of initial replicated yield tests, from 1986 to 1989, at Hammam Al-Alile (250-350 mm) Rihane 03 exceeded the local Aswad barley (LA) by 33, 124 and 54 percent, respectively.

Since 1991 a plan was executed to spread this cultivar in the limited and moderate rainfall regions of northern Iraq. In 1991 the cultivar was planted at seven locations (22 ha) at the farmer level. Rihane 03 exceeded the local variety by 14 percent in straw yield and 31 percent for grain yield. Total production in 1992-1993 was 129 tons.

The area was expanded in 1994 to 494 ha, with total production of 761 tons and an average yield of 1544 kg/ha (the range was 600-2597 kg/ha). During 1994-95 the area was expanded to 5000 ha with 78 farmers. Production was over 4000 tons and the range of grain yield was 528 to 2572 kg/ha. Rihane 03 exceeded the local average by 13 to 206 percent at different locations and among farmers. The targetted area is 250,000 ha by 1997. Rihane 03 was popular with farmers for its lodging resistance, high potential yield (reaching up to 4000 kg/ha under good rainfall and fertilization conditions) with good protein content (13 percent) and suitability for breadmaking by mixing with 50 percent wheat flour or even baked alone. Likewise, it is a dual purpose barley that could be grazed and gives good grain yield. Rihane 03 was officially accepted for release in 1993.

Improved and Promising Barley Cultivars and Their Role in Yield Increases of Rainfed Agriculture in Syria

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Abstract

The Syrian National Program used several breeding methods to improve the barley crop. These methods include plant introduction, hybridization, mutation and local landraces.

As a result of the continuous breeding efforts it was possible to release and identify several cultivars and lines with potential in low rainfall areas.

First: cultivars for the moderate rainfall (250-350 mm) areas

Furat 1: Six-row, released in 1987, outyielded the local variety by 9 percent.

Furat 2: Two-row, released in 1987, outyielded the local variety by 11 percent.

Improved Arabi Abyad: released 1992, outyielded the local variety by 19 percent.

It also outyielded Furat 1 by 11 percent and Furat 2 by 12 percent.

Furat 4128, a promising six-row line, is suitable for the Raqqa area. It outyielded the local variety by 28 percent. Lubnan, a two-row line suitable for the Hasakeh area, outyielded the local by 15 percent.

Second: Cultivars for low rainfall (around 250 mm) areas.

Furat 4807, a promising mutant two-row line, outyielded the local variety by 31 percent. Furat 4484, a six-row line, outyielded the local variety by 11 percent in the Hasakeh area. Promising lines 5330 and SLB-0-2-47—both two-row lines—are suitable for the Hasakeh and Aleppo areas.

اصناف الشعير المحسنة والمبشرة ودورها في رفع غلة

المناطق المطرية في سوريا

بهاء الدين جمال و محي الدين جبه

مديرية البحوث العلمية الزراعية - دوما - سوريا

الملخص

نتيجة البحوث المتواصلة تم التوصل الى شبكة من الاصناف يمكن ان تساهم في رفع غلة هذا المحصول في المنطقة قليلة الامطار (٢٥٠ مم سنوياً) ومتوسطة الامطار (٢٥٠-٣٥٠ مم)،
أولاً: أصناف المنطقة متوسطة الامطار:

فرات ١ : سداسي الصف، تم اعتماده عام ١٩٨٧ أفضل غلة من الصنف عربي أبيض بـ ٩٪.
فرات ٢ : ثنائي الصف اعتمد عام ١٩٩٠، أفضل غلة من الصنف عربي أبيض بـ ١١٪. عربي أبيض محسن: تركيب وراثي ثنائي الصف منتخب من الصنف عربي أبيض اعتمد عام ١٩٩٢ أفضل غلة من الصنف عربي أبيض بـ ١٩٪ ومن المحسن فرات ١ بـ ١٤٪. الصنف المبشر فرات ٣٧١٧ : سداسي الصف أفضل غلة من الصنف عربي أبيض ٣٨٪ و من الصنف فرات ٢ بـ ١٢٪ ومن فرات ١ بـ ١١٪. الصنف المبشر فرات ٤١٢٨ سداسي الصف، أفضل غلة من الصنف المحلي عربي أسود بـ ٢٨٪ يصلح لمحافظة الرقة. الصنف المبشر لبنان : ثنائي الصف أفضل غلة من الصنف عربي أسود بـ ١٥٪ يصلح لمحافظة الحسكة.
ثانياً اصناف المنطقة قليلة الامطار:

الصنف المبشر فرات ٤٨٠٧ : طفرة وراثية ثنائية الصف، أفضل غلة من الصنف عربي أبيض بـ ٣١٪. الصنف المبشر فرات ٤٤٨٤ : سداسي الصف، أفضل غلة من الصنف عربي أسود بـ ١١٪. يلائم محافظة الحسكة. الصنفان المبشران ٥٣٣٧ ثنائي الصف منتخب من العربي الاسود، والصنف SLB-٠٠-٢-٤٧ ثنائي الصف : الصنف فرات ٥٣٣٧ أفضل غلة من الصنف عربي أسود ٩٪ و بـ ١٤٪ للصنف SLB-٠٠-٢-٤٧ وهما ملائمان لمحافظة الحسكة وحلب.

Accurate Timing of Nitrogen Application Can Increase Barley Grain Yield

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Abstract

In Iraq, traditional top-dressing of nitrogen is based on calendar date i.e. 45 days from sowing. However, this is not the most effective way to use nitrogen because the development stage of the crop at that time is ignored. The objective of this study was to investigate the importance of timing the recommended rate of nitrogen fertilizer according to certain developmental stages of apex (spike). A two-year field study using widely grown cultivars, Arivate (*Hordeum vulgare* L.), six-rowed barley and clipper (*Hordeum distichum* L.)-two-rowed barley was conducted during the 1992/1993 and 1993/94 seasons at the experimental farm of the College of Agriculture, Abu Ghraib, Iraq. Timings of application were at double ridges, maximum spikelet number and booting stages. The results showed that, in general, splitting nitrogen twice or three times resulted in a significant increase of grain yield for both cultivars in both seasons compared with the traditional method of application. This increase in grain yield was associated with significant increases in ear number/m², 1000 grain weight (g), total biomass (g/m²) and, more interestingly, the harvest index, especially for the triple application. However, late single application at booting stage tended to reduce grain yield of both cultivars due to decreased ear number and total biomass. For cultivars, Arivate out-yielded clipper in both seasons due to higher 1000 grain weight, total biomass and harvest index.

In conclusion, this study suggests that nitrogen should be applied at certain critical development stages when the crop's demand for nitrogen is high.

أستجابة الشعير للتسميد في سوريا

طلال الخضراء و زهير زاهر

مديرية الاراضي - دوما - سوريا

الملخص

ان عملية تسميد الشعير من العوامل الزراعية الهامة التي تساعد على زيادة الغلة. وقد بدأت عملية تسميد الشعير منذ مطلع الخمسينات واستمرت جهود الباحثين في القطر منذ ذلك الوقت وما زالت متوافقة مع تطورات الاصناف الجديدة والوضع الخصوبي للتربة وذلك لمعرفة الجرعة السمادية المناسبة. ونظراً لانتشار زراعة محصول الشعير في مناطق الاستقرار الزراعي الثانية والثالثة، وتذبذب الامطار في هذه المناطق من موسم لآخر، وعدم استقرارها ضمن الموسم الواحد، فإن تسميد الشعير يعتبر عملياً أعقد من تسميد المحاصيل الأخرى. وتشير الدراسات المنفذة الى ان ١٥٪ فقط من مزارعي الشعير يستخدمون الاسمدة على الرغم من حاجة التربة الى العناصر الغذائية الأساسية، آزوت وفسفور لذلك تركزت الجهود خلال السنوات الأخيرة لتحديد الجرعة السمادية المناسبة لمحصول الشعير من خلال شبكة من التجارب نفذت في مختلف مناطق زراعة الشعير.

تستعرض هذه الدراسة القضايا الهامة التي تتصل بتسميد محصول الشعير في سوريا، حيث تستعرض نتائج التجارب والملاحظات التي نفذت بالتعاون مع ايكاردا ومع مشروع المشرق وتعرض الدراسة الى الوضع الخصوبي لمناطق زراعة الشعير وسبل تأمين الاحتياجات السمادية.

Effect of the Delay of the Second Round of Clipping on Green Forage Yield, Grain Yield, Aftermath Biomass and Tolerance to Clipping for Some Dual Purpose Barley Lines

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Abstract

Dual purpose barley genotypes usually lend themselves to two consecutive rounds of clipping in a once over operation for each round when stand reaches—on extended leaf basis—32 to 36 cm in height. However, the second round of clipping is frequently delayed, especially when sheep grazing is practiced. The effect of such a delay on green forage production, recovered grain yield, aftermath biomass and tolerance to clipping was investigated in an experimental split plot in a randomized complete block design replicated three times in 1992-1993 and 1993-1994 seasons. Five dual purpose barley lines (main treatments) and three or four levels of delayed second round of clipping were carried out after 4, 8, 12, and 16 days from the recommended height of the second round of clipping (subtreatments). Results indicated that for both seasons, a delay of four days resulted in a significant increase ($P < 0.05$) in green forage yield. Recovered grain yield after four days of delays was significantly reduced for all genotypes in both seasons except for line IPA 99 which had tolerated a delay of up to four days of delay in the 1992-1993 season.

Mean forage turn out for all genotypes in the 1992-1993 season exceeded that of the 1993-1994 season by >2 times. The average recovered grain in the 1992-1993 season was 0.47 of that of the 1993-1994 season. Such inconsistencies could be attributed to seasonal variations and to different management practices.

The aftermath biomass was significantly ($P < 0.05$) reduced when the second round of clipping was executed at 4 days from the recommended clipping date (Od treatment). Seasonal changes and different management practices played a lesser role in stand re-establishment after the second round of clipping as genotypes mean performance in the 1992-1993 season was 0.74 of that of the 1993-1994 season. It is suggested that the genetic make-up of the line plays an important role in re-establishment. Tolerance to clipping for the majority of the genotypes was lost when clipping was practiced at or after the recommended height. Such results suggest a re-evaluation of the stand height at which the second round of clipping is practiced.

Developing Cultivated Forage Legumes for Improved Yield and Quality to Feed Livestock in the Dry Areas

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Abstract

The West Asia and North Africa (WANA) region is experiencing increasing pressure on its agricultural resource base due to rapidly growing livestock and human populations (FAO 1987; Alexandratos 1988). A shortage of animal feed is imposing a heavy burden on the rangelands, which are rapidly deteriorating. Severe feed and food deficits have also triggered replacement of fallow-barley rotation with continuous barley cultivation in dry land agriculture and increased cropping on marginal lands. The result is degradation of the soil resource base (Jubert 1985, Oram 1988). Expansion of cultivation of such legumes as vetches (*Vicia* spp.) and chicklings (*Lathyrus* spp.), which are indigenous to the Mediterranean basin, can augment feed and food supply when sown either to interrupt barley monoculture or to replace fallow in fallow-barley rotation (Abd El Moneim *et. al.* 1988; 1990). These species are sown and harvested in a single year and can be used for grazing during winter, harvested for hay in spring, or carried to maturity for seed and straw. Their introduction in the rotation increases the productivity of food and feed and, therefore, the land's animal carrying capacity (Cocks 1988, Harris *et al.* 1991; Papastylianou, 1991) in a sustainable manner. This is because of better maintenance of organic matter and nitrogen status of soil (Peter White, pers. communication), improved soil physical conditions and better control of the diseases and pests as compared to continuous cereal rotations.

Improving Feed Legumes for the Central Highlands of Turkey

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Abstract

In the Central Highlands of Turkey (CHT), characterized by cold winters and dry summers with the extremes of air temperatures, forage crops are still under-exploited as a part of crop rotations. There is a shortage of good quality feed, especially during winter. Half of the vetch in Turkey is located in the CHT, and farmers still use local cultivars that have good adaptability but low yield potential. Therefore, with the aim of identifying and improving the annual forage legume species for the CHT's cold and dry environment, work was carried out under a collaborative Turkey/ICARDA project during the 1992/93, 1993/94 and 1994/95 crop seasons. Initial results show that autumn-sown forage legume species had more potential than the spring-sown ones. Hungarian vetch (*Vicia pannonica*) and wooly-pod vetch (*Vicia villosa* ssp. *dasycarpa*) were promising vetches for autumn-sowing for grazing and/or hay. Narbon vetch (*Vicia narbonensis*) also performed better in the autumn-sown over the spring-sown situation. Chicklings (*Lathyrus* spp.) were also found to be promising additional alternatives to spring-sown vetches. Accession 751 of Hungarian vetch, 694/1 of wooly-pod vetch, 793/A of narbon vetch, 1033 of bitter vetch (*Vicia ervilia*), 794 of common chickling (*L. sativus*) and 812 of dwarf chickling (*L. cicera*) were considered better than others.

Forage and Seed Production of Vetches (*Vicia spp.*) at Different Seeding Rates Under Rainfed Conditions

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Abstract

Field experiments were conducted at three different locations: the farm of the College of Agricultural and Forestry at Hammam Al-Alil for two successive seasons (92/93 and 93/94), and at Telafar and Rabiaa Agricultural Research stations in (93/94) under rainfed conditions. The purpose of the experiments was to study forage and seed production under different seeding rates (40, 80, 120, 160, and 200 kg/ha) for two vetches (*Vicia sativa* and *Vicia dasycarpa*). Results showed that *vicia sativa* produced greater forage and seed yields than *vicia dasycarpa* and had a greater harvest index.

Vicia dasycarpa produced the longest branch length. There were no significant differences in number of branches per plant between the two species. Maximum forage production was obtained at 120 kg/ha, whereas 80 kg/ha was for seed production for the three locations. The longest branch length increased with increasing seeding rates, but the number of branches per plant decreased with increasing seeding rates.

There were no clear differences in forage and seed yields between the three locations except for the 92/93 season at Hammam Al-Alil, where greater forage and seed yields were produced.

Effect of Seeding Rates and Barley Harvesting on Forage and Seed Production in Some Forage Legumes

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Abstract

The benefits of including forage legumes in the farming systems of the Mediterranean region are well known, but more research is needed on the effect of management factors on forage and seed production. Field trial was carried out during 1992/93 (614.8 mm) and 1993/94 (394 mm) to study the effect of three seeding rates (40, 80 and 120 kg/ha) and three harvesting treatments, on forage and seed production and yield components in four forage legumes (*Vicia sativa* sel. 2541, *Vicia ervilla*, *Vicia villosa* supsp. *dasycarpa* and *Lathyrus sativus* sel. 311). The species were sown in November in both years. The crops were harvested first in March, with the regrowth left for seed production. The second harvest took place at pod formation, and a third time at maturity. The results indicated that average dry-matter and seed yields were increased by increasing seeding rates in both seasons. *Lathyrus sativus* was the lowest yielding species at early harvest, while *Vicia sativa* was the highest yielding in late harvest. Harvesting legume species early in March and then leaving them for seed production caused a considerable reduction in seed yield. This reduction was most marked with *Vicia ervilla*. Other seed components were affected slightly by seeding rate. The relationship between their adaptation to the prevailing environmental conditions and their possible uses are discussed.

Sheep Improvement, Nutrition and Management
Session 7, 8, 9 & 10

Environmental and Genetic Factors Influencing Milk and Growth Traits of Awassi Sheep in Cyprus

I. Estimates of Genetic Parameters

A. P. Mavrogenis

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Abstract

Data on 1213 ewes and 1382 lambs of both sexes born between 1978 and 1991 at the Orites livestock unit were utilized in a study of environmental factors affecting ewe productivity and lamb growth of the Awassi breed. Genetic and phenotypic parameters were estimated for some production and reproductive traits of the ewe and for growth traits of the lamb. Year and season of lambing significantly affected all production and reproductive traits of the ewe and the growth traits of lambs. Lamb birth weight was not affected by season of lambing. Parity (lactation number) had a significant quadratic effect on all ewe and lamb traits, with the exception of the post-weaning lamb growth rate, which is probably free of maternal effects. Type of birth and sex were the most important sources of variation for lamb growth, with the exception of post-weaning daily gain, which was not influenced by type of birth.

Estimated heritabilities for ewe production and reproductive characters were modest, but generally high enough to justify selection procedures for their improvement. In particular, the estimates for prolificacy (0.30 - 0.08) and partial (0.58 - 0.12) or total-lactation milk yield (0.56 - 0.11) indicated that both traits can be improved, particularly prolificacy, which is one of the weaknesses of the breed. Response to selection for postweaning growth rate is probably the best criterion of selection to improve lamb performance. The absence of genetic antagonisms among ewe or lamb traits indicated that correlated responses in other traits from selection on milk production or postweaning growth would not be negative.

Environmental and Genetic Factors Influencing Milk and Growth Traits of Awassi Sheep in Cyprus

II. Heterosis and Maternal Effects

A. P. Mavrogenis

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Abstract

Data on 5234 purebred and crossbred ewes and 6457 purebred and crossbred lambs of both sexes, born between 1978 and 1986 at two government farms (Athalassa and Orites) were utilized to study some environmental factors that affect ewe productivity, milk production and lamb growth. Breed and heterosis effects (individual and maternal) were also estimated. Most of the environmental factors examined were significant sources of variation for the reproductive and production traits of the ewes and the growth traits of the lambs. Chios ewes were significantly more prolific than Awassi and crossbred ewes. They also produced heavier litters at birth and at weaning than Awassi ewes. In groups Awassi lambs were heavier at birth, at weaning and at 105 days of age and had a faster growth rate than Chios lambs. Crossbred lambs were mostly heavier and faster growing both before and after weaning than either purebred group. All estimates of individual heterosis for ewe reproductive and production traits were negative except for total lamb weight at weaning. On the other hand, estimates for maternal heterosis were positive, although those for milk production were close to zero. All lamb traits exhibited positive heterosis effects of crossbreeding. In addition, individual heterosis was more important than maternal heterosis.

Genetic Analysis of Crossing Local Awassi with Assaf and Turkish Awassi

A. A. Al-Rawi

IPA Agriculture Research Center, Baghdad, Iraq

Abstract

A total of 4701 lambs were studied to assess complementarity of different mating systems using Assaf (A), Turkish (T) and Awassi (L) as straightbreds. Heterosis, relative weight gain, additive values of the breed combination and the non-additive contribution of the crossbreeds were estimated. Linear and quadratic regression analysis were carried out to evaluate the effectiveness of Assaf or Turkish Awassi genes substitution to the local Awassi genes.

Results indicated that no heterosis was observed in birth weight. Heterosis for weight at six months ranged from -2.1 to 9.3 for 3/4A and 1/4T, respectively. An increased proportion of Assaf or Turkish genes caused an increase in the weight at weaning, 6, 9 and 12 months of age. Weight at 12 months increased by 76.2 and 6.5 g in Assaf or Turkish Awassi genes, respectively, for each 1 percent increase. Maximum relative body gain (22.7 percent) was attained at six months by 3/4 Assaf. The additive effect of breed combination was the major component of live body weight relative to the nonadditive contribution of the crossbreeds. This result indicates the high heritable portion of the breed combination (additive effect) in the crossbreeds and will allow for selection and mating programs within each genetic groups.

Genetic Parameters of Some Economic Traits in Sheep

M. H. Al-Salman, A. A. Al-Rawi and H. A. Al-Haditheh

IPA Agricultural Research Center , Baghdad, Iraq.

Abstract

The fat-tailed Awassi is indigenous to West Asia. In 1990 a large breeding project was initiated by the IPA Agricultural Research Center in cooperation with Mashreq Project at Al-Radwanieh, 20 kilometers west of Baghdad. The objective of the project was to develop genetic groups that could fit various production systems in West Asia (dry land, extensive, and semi-intensive system). A performance recording scheme was implemented at the station. At-birth lambs were identified and their sires and dams were recorded. Lambs were weighed at birth (BWT), weaning (WWT), 6 months (WT6), 9 months (WT9) and 12 months (WT12) of age. Purebreds (Assaf, Turkish Awassi and local Awassi) and their crosses were evaluated for BWT, WWT, WT6, WT9 and WT12 using general least squares and maximum likelihood techniques.

A mixed model was used to determine the influence of some non-genetic factors (fixed effects) and to estimate variance-covariance components of a random variable. Heritability estimates for BWT, WWT, WT6, WT9 and WT12 were 0.56, 0.33, 0.33, 0.26 and 0.32, respectively. Genetic correlations among various body weights ranged from 0.0005 for BWT and WWT to 0.914 for WT6 and WT9, whereas phenotypic correlations ranged from 0.0052 for BWT and WT6 to 0.978 for WT9 and WT12. These results revealed the existence of additive genetic variability and furthermore confirmed that selection for heavy body weight could be effective, especially at six months of age.

Relationship Between Body Weight and Dimension Traits in Awassi Sheep

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Abstract

This study was conducted on 584 lambs born in the 1991 and 1992 seasons to investigate some environmental factors affecting weights at birth, weaning, six and nine months of age, weight gain and different body dimensions (body length, heart girth, height and width at withers and hips, chest depth, barrel and fat tail dimension, including length, width and circumference).

Year of birth, lamb breed group, sex and type of birth were generally affected traits studied. Dimensions of the crossbred lambs were higher than those of purebred lambs at weaning, 6 and 9 months of age. Meanwhile, fat length and width of the crossbred lambs were smaller than that of Turkish and Local Awassi lambs at weaning. However, fat tail length and width showed the superiority of crossbred lambs over the local Awassi at 6 and 9 months of age. The adjusted data were used to estimate the correlations among weights and weight gains with different body dimensions. Different predicted equations were formulated to estimate the live body weight at weaning, 6 and 9 months of age from their respective body measurements. The best predicted equation according to the R value (coefficient of determination) was selected to predict the weight from dimensions.

علاقة نموذج الولادة مع رقم الموسم في الماعز الشامي

أيمن دبا

مديرية البحوث العلمية الزراعية - دوما - سوريا

الملخص

الحصول على ولادة توأمية من حيوانات المزرعة هدف اقتصادي لدى مربّي الحيوان. ويعتبر الماعز الشامي أحد عروق الماعز ذو المعدلات التوأمية العالية وهذا ما أكدته هذه الدراسة حيث يبلغ متوسط حجم الولادة للعنزة الشامية بشكل عام ١,٦٧ مولود.

أجريت الدراسة على قطيع محطة بحوث قرحتا لتحسين الماعز الشامي/ محافظة ريف دمشق/ وذلك على (١٢٣٧) حالة ولادة موزعة على اثنتا عشر سنة وضمن عشر مواسم انتاجية (سجلات) وتبين ان: قمة الولادات التوأمية في الماعز الشامي تقع بين الموسم الثالث والسادس حيث أن أعلى معدل للولادة التوأمية الثنائية في الموسم الثالث ٦٦,٤٦٪ وأعلى معدل للولادة الثلاثية في الموسم السادس ١٨,١٨٪ وأعلى معدل للولادة الرباعية في الموسم السادس كذلك ٦,٠٦٪.

كما ان أعلى حجم ولادة في الموسم السادس ١٩٩,٩٨ مولود من ١٠٠ ولادة وأعلى معدل توائم في الماعز الشامي هو في الموسم الثالث ٧٨,٠٥٪. والولادات التوأمية الثلاثية هي صفة أساسية في الماعز الشامي، تبدأ من الموسم الأول وتنعدم في الموسم التاسع التي تضعف فيه الولادات التوأمية الثنائية أيضاً. أما الولادات التوأمية الرباعية فهي صفة نوعية حيث توجد في بعض العنزات دون أخرى وتبدأ من الموسم الثاني وتنعدم في الموسم الثامن وما بعده أي توجد في الفترة الانتاجية العالية للعنزة فقط.

Reproductive Performance of Awassi Ewes With Artificial Insemination Using Fresh Semen

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Abstract

Oestrus distribution, gestation length, lambing distribution, and lambing rates of cervical insemination (os cervix) using 0.2 ml of fresh semen were studied using 1786 Awassi female yearlings (18 months), 367 ewes and 17 Ceylanpınar and 4 Israeli Awassi rams. In another study four different fresh semen doses were tested under the extensive conditions of the Ceylanpınar State Farm. The results indicated that over 70 percent of the yearlings and 85 percent of the ewes were inseminated within 20 days of the mating season. Similarly, a majority of the lambing was distributed over a span of three weeks. Lambing rates due to the first cervical insemination of the yearlings and the ewes were 61.0 and 70.3 percent, respectively. Lambing rates of the two inseminations were 71.2 and 82.8 percent, respectively. These results are fairly high compared to the results reported in previous studies.

The results of the semen dose study showed that under field conditions, where semen quality is assessed subjectively, 0.3 ml of fresh semen via cervical insemination may improve lambing rates (88 percent) significantly. Lambing rates using 0.2, 0.4 and 0.5 ml were found to be 68, 64 and 66 percent, respectively.

Effect of Vitamin A on the Reproductive Performance of Awassi Sheep

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Abstract

Reproductive performance in both rams and ewes could be affected during the long and dry mating season in rainfed areas in Iraq. One of the reasons for this may be the shortage in green roughage, an important source of Vitamin A. Three experiments were conducted to determine the effect of Vitamin A treatment during mating season on the reproductive performance of ewes and rams. In Experiment 1, groups of five ram lambs were either monthly treated for 16 weeks with 50000 IU (T1), 100000 IU of Vitamin A (T2) or left as a control (C, 4 lambs) to assess the effect of Vitamin A on spermatogenesis. In Experiment 2, 12 rams were evenly divided to be monthly treated for 20 weeks with either 100000 (T1), 200000 IU of Vitamin A (T2) or left as control (C) to study semen quality. Experiment 3 used 300 ewes in three flocks which were divided into two sub-groups each, one treated with a double dose of 150000 IU of Vitamin A during mating season and the other left as a control group to evaluate the treatment's effect on some reproductive traits. Spermatogenic cell's relative weight (Exp. 1) was greater after Vitamin A treatment by 72 percent (T1) and 141 percent (T2) compared to C group. In rams (Exp. 2), there was a drop in ejaculate volume, sperm concentration, total sperms/ejaculate and an increase ($P < 0.05$) in dead and abnormal sperms in C group with advancing time. Farm trial (Exp. 3) showed that Vitamin A treatment improved the lambing rate by 8 percent and the twinning rate by 1.6 percent.

In conclusion, using Vitamin A during sheep mating season in dryland areas improves reproductive performance in sheep. This treatment could be more effective during mid and late mating season.

Is It Worth While Selecting for High Cereal Straw Quality in the WANA Region?

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Abstract

For animal production and in the farm economy, the nutritive quality of cereal straw can, in wet years, be more important than its quantity. In most WANA countries the surplus of straw produced in wet years is stored for feeding in less plentiful years, or is not fed at all. This paper discusses the opportunities for improving straw quality by breeding and weighs the benefits, which include a more saleable commodity or a stored fodder which needs less supplementation with other feeds. Breeding for straw quality can improve the nutritive value of the straw in a manner that costs virtually nothing in contrast with chemical treatment. It also helps to increase the adoption of cereal varieties.

Utilization of Barley Stubble By Awassi Sheep

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Abstract

Three experiments examined the effects of stocking rate and supplementation on patterns of removal of head, leaf and stem and on intakes of metabolizable energy (ME) and crude protein of sheep during 28-day periods grazing stubble. Removal of the stubble fractions was estimated by cutting samples to ground-level on days 0, 2, 4, 6, 8, 13, 23 and 28 using a quadrat (4.25 x 0.47 m). Before grazing there was approximately 1.1 tonnes of dry matter/ha (5% heads, 50% leaf and 45% stem). Head was always selected in the first days on a new area and total intakes decreased rapidly through the period. In experiment 1 stocking rates of 20, 40 and 60 wethers/ha resulted in mean ME intakes of 10.3, 7.8 and 5.6 MJ/day and live weight changes in 30 days of +0.3, -2.1 and -3.2 kg. Experiment 2 compared supplements of 0 and 200 g/day of barley or of cotton seed and experiment 3 compared supplements of 0, 150 or 300 g/day of barley or 160 or 320 g/day of a 65:35 mixture of barley and cotton seed at stocking rates of 20 and 40 ewes/ha. Supplements of barley depressed intake of stubble, especially in the first week on a new area. Supplements, particularly of cotton seed and barley and cotton seed mixture, increased weight gains, especially at the lower stocking rate.

Browse Foliage and Annual Legume Pods as Supplements to Low Quality Roughages for Sheep in Semi-Arid Morocco

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Abstract

Cereal stubble and straw are widely used as animal feeds for sheep in arid areas of Morocco. Their low protein concentration limit their intake and therefore their potential of production. A 15-wk feeding trial was conducted to investigate the effect of supplementation with browse foliage or medic (*Medicago sp.*) pods on wheat (*Triticum aestivum L.*) straw intake and ewe lamb live weight. Diets were wheat straw (WS), WS plus alfalfa (*Medicago sativa L.*) hay (AH), WS plus oldman saltbush (*Atriplex nummularia Lindl.*) foliage (AN), WS plus blue wattle (*Acacia cyanophylla Lindl.*) foliage (AC), and WS plus medic pods (MP). Alfalfa and urea feeding levels were set to provide a crude protein (CP) concentration of 90 g kg⁻¹ D=M in the diet. Shrub foliage and medic pods were offered ad libitum. Atriplex and Acacia foliage supplementation resulted in the highest and lowest straw intake increase, respectively. These findings would contribute to explain why animals receiving Atriplex foliage in addition to wheat straw were the only ones to maintain weight over a 15-wk period. Medic pod supplementation resulted in an insignificant weight loss.

These results showed that foliage from palatable shrubs and medic pods can be effective protein supplements for livestock consuming wheat straw. Implementing such strategies would require that farmers plant oldman saltbush (*Atriplex nummularia Lindl.*) shrubs on their private land and manage medic pasture to produce enough pods to be grazed in summer.

Guideline for the Management of the Nutrition of Flocks in West Asia During the Dry and Mating Periods: What Information Do We Have and What We Need?

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Abstract

Lambing percentages of less than 80% are common in Awassi flocks in West Asia. Although the Awassi breed is inherently seasonal in its oestrous activity, surveys show great seasonality of lambing, with a peak in winter which appears to relate to the increase in oestrous activity which occurs when nutrition improves in summer and autumn when stubbles and residues of irrigated crops are grazed. This offers the prospect that improved management of nutrition could lead to increased lambing percentages. Increasing fertility, without any change in ewe fecundity, from 80% to 95%, would result in a 19% increase in potential flock performance. This paper reviews recent work on effects of body condition and nutrition at mating on ovulation rate, on stocking rate and supplementation on the performance of ewes grazing stubble and mineral and vitamin deficiencies, which offer tentative guide-lines for managing Awassi ewes in the dry and mating periods.

Improvement of Small Ruminant Production and Management

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Abstract

The shortage of feed is considered a principal constraint to small ruminant production in the dry areas of West Asia and North Africa. This is largely due to the low productivity of the rangelands. Production of other roughages is also low and varies considerably from year to year. The indigenous breeds of the region are hardy and well adapted to the harsh environment, but they are characterized by low productivity because of their low genetic potential, poor nutrition and reproduction and the high incidence of disease and mortality.

Further efforts are needed to increase small ruminant production. This could be achieved by improving feed resources, improving nutrition and management and implementing appropriate health control and preventative measures. Given that the rangelands are already overgrazed, there is little scope for increasing the numbers of small ruminants to meet demand for animal products. Increases in small ruminant production must therefore come from intensification, the integration of crop and rangeland production and higher production per animal. Small ruminant production may be increased by reducing the age of ewe lambing, early weaning and fattening of lambs and kids on balanced diets, by improving nutrition and better management before and during mating and by implementing prevention and control health measures such as vaccinations, and drenching and dipping against endo- and ecto-parasites.

Bioeconomics of Small Ruminant Production in Lebanon

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Abstract

A 1993 survey of small ruminants in the Bekaa Valley of Lebanon revealed three basic management systems: system 1 is composed of sedentary village flocks, system 2 is composed of migratory semi-nomadic flocks, and system 3 is composed of semi-sedentary flocks. A follow-up in-depth survey was conducted in 1994-95 on 16 representative farmers from these systems to monitor the bioeconomics of their flocks, including the impact of a preventive health intervention. Results indicated a low productivity in all three systems, coupled with high mortality and abortion rates. Feeding and health management were found to be major limitations to improved productivity.

Preventative health intervention improved birth and 90 days weight in both sheep and goats among systems. However, it did not effect milk production except in goats of migratory flocks. Body score of goats was not influenced by system, health intervention or season. However, treated sheep had higher body scores than control ones, namely in fall and winter.

The survey determined cost, revenues, and profit per unit mix of sheep and goats. Farmers who had more sheep than goats had more profitable gain. Moderate size flocks were more profitable than those small and large flocks.

Feed Resources and Feed Balance in Jordan

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Abstract

Given the current high prices for livestock and livestock products in Jordan, forage legumes are an increasingly attractive crop for farmers. Therefore the need to increase forage production to meet the growing livestock population in Jordan necessitates the evaluation of forage legume species within the traditional farming system cereal/fallow to maximize herbage yield and to improve land profitability.

In 1980 the Ministry of Agriculture, University of Jordan, the Jordanian Cooperative Organization and the Jordanian/Australian Dry Land Farming System Project started to study different forage legume species such as vicia, lathyrus and medicago for their adaptability and production under various rainfed conditions in Jordan. This work continued through the Mashreq Project.

This paper will discuss the main feed resources in Jordan, which include: range and marginal land vegetation; field crop residues, agriculture and industrial by-products, cultivated forages and sources of concentrates. The paper will discuss on-going research in forage production, which is expected to have a future impact on feed availability in Jordan.

The Role of Crop Residues and Agro-Industrial By-Products in Filling the Deficit of Animal Feedstuffs in the Middle East

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Abstract

Livestock productivity in the Middle East is low because of the shortage of feeds and forages. Many countries rely on imported cereal grains for livestock feed. However, optimal animal production should be sought through greater use of local resources, and efforts are now being exerted to establish permanent research and development programs aimed at increasing animal productivity based on local resources. Crop residues, agro-industrial by-products and animal wastes that are not widely utilized can fill at least part of the gap between supply and demand for conventional feed resources. This paper provides information on by-products available in the region, methodology for estimating quantities available. This paper also reviews the experience gained within and outside the region on the use of non-conventional feedstuffs, methods employed for upgrading their nutritional, storage and handling qualities and how urea-blocks made of by-products may be used to fill the deficit for animal feedstuffs in the Middle East region.

Effect of Using Two Types of Covers of Urea-Treated Straw on Nutritive and Economical Values

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Abstract

Chopped wheat straw was treated with a solution of 45 urea using two types of covers (plastic and mud). Samples of treated straw were analyzed chemically and it was found that the C.P. (8.78 percent) content in straw covered with plastic was more than with straw covered with mud (6.6 percent).

Four groups of Awassi lambs were fed on this straw with supplement (pelleted concentrate and barley).

1- T.S.P.C	2- T.S.P.B
3- T.S.M.C	4- T.S.M.B

Group 2 (treated straw, mud cover with barley) had a higher growth rate (130 g/head/day), while Group 1 (treated straw, plastic cover with pelleted concentrates) consumed more feed (934 g/head/day) on a D.M. base, also consumed more C.P. (155 g/head/day).

The use of urea in the feed had no effect on physical characters of carcass. Labor was the most limiting factor in the economy of using different covers.

أثر تغذية الأغنام العواسي التي ترعى على بقايا المحاصيل بالمكعبات العلفية

على الزيادة الوزنية

محمد جليل أمين

مديرية البحوث العلمية الزراعية - دوما - سوريا

الملخص

يعتبر تصنيع وتقديم المكعبات العلفية للأغنام ذات فائدة كبيرة خاصة لتلك التي ترعى على المخلفات الزراعية.

والمكعبات العلفية هي عبارة عن خلطات من بعض المخلفات الزراعية، وبعض المواد المضافة، ك: زرق الطيور المجفف - تفل الشوندر - عرجون الزيتون - نخالة القمح - المولاس، بالإضافة الى ملح الطعام - اليوريا - خلطة المعادن والفيتامينات - أوكسيد الكلسيوم - الجبصين - الاسمنت - كبريتات الصوديوم، وغيرها، بالإضافة الى الماء.

وقد تمت تجربتها بنجاح على عدد من القطعان، ففي السويداء ولدى أحد المربين تمت تجربتها على مجموعتين من الأغنام، مجموعة تجربة مكونة من ٦٤ رأس قدمت لها المكعبات ومجموعة شاهد من ٧١ رأس لم يقدم لها المكعبات. واستمرت التجربة لمدة ثلاثون يوماً. حققت اغنام التجربة (التي قدمت لها المكعبات) زيادة وزنية يومية للرأس الواحد ٨٧ غرام/يوم/ساعة، والثانية مجموعة الشاهد (التي لم يقدم لها المكعبات) زيادة وزنية للرأس الواحد ٣١ غرام/يوم، ولم يتجاوز المأكول من المكعبات الـ ٦٠ غرام/يوم لمجموعة التجربة.

Using Urea Feed Blocks in Fattening Awassi Lambs

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Abstract

The potential utility of urea feed blocks as a nitrogen supplement for fattening Awassi lambs was investigated in on-station and on-farm experiments. This adaptive research was conducted to demonstrate the possibility of improving the performance of fattening lambs fed a whole barley grain diet, which is traditionally used by farmers in Iraq. Feed blocks were manufactured from urea and locally available agro-industrial by-products.

In on-station experiments, 24 Awassi lambs, aged 6 months (30 kg live weight), were divided into three groups according to their live weights. Group 1 (T1) was fed the farm diet, which included whole barley grain only ad libitum. Group 2 (T2) was fed whole barley grain plus urea feed blocks ad libitum. Group 3 (T3) was fed a concentrate mixture ad libitum.

The on-farm experiments were conducted at two locations in the Mosul area. Eighty (Exp. 2) and 90 (Exp. 3) Awassi lambs aged 6-7 months were conducted in these locations. Lambs at both location were divided into two groups according to live weight. Group 1, fed the farm diet, was measured daily and lamb weights were recorded at the beginning and at the end of each experiment.

The results of Experiment 1 show that mean live weight gains were 174, 195 and 221 g/day for Groups 1, 2 and 3, respectively. Mean feed conversion ratios were 6.54, 6.15 and 5.83 kg dm/kg live weight gain for Groups 1, 2 and 3, respectively. These results indicated that urea feed blocks improved the performance of fattening lambs.

The results of on-farm experiments (Exp. 2 and Exp. 3) showed similar trends to those observed in Experiment 1. The results give should help convince farmers that using urea feed blocks will improve the performance of fattening lambs.

أثر استبدال ٣٣٪ من الاعلاف المركزة المستخدمة في

تسمين جدايا الماعز الشامي

بعد الفطام ومدة ثلاثة أشهر بزرق الدواجن المجفف

أيمن كركوتلي

مديرية البحوث العلمية الزراعية - دمشق - سوريا

الملخص

في هذه الدراسة تم اختبار أثر استخدام ٣٣٪ من زرق الدواجن المجفف من إجمالي الاعلاف المركزة المقدمة لجدايا الماعز الشامي. استخدم في التجربة (٤٠) أربعون رأساً من جدايا الماعز الشامي منها عشرون للتجربة وعشرون كشاهد، كان متوسط وزن جدايا التجربة في بداية التجربة (١٧،٢٦) كغم ومتوسط أعمارها (١٠٤) يوم، أما جدايا الشاهد في بداية التجربة فكان متوسط وزنها (١٧،٥٧) كغم ومتوسط أعمارها (١٠٣) يوم. غذيت جدايا التجربة على عليقة مركزة مكونة من: ٢٥٪ شعير، ٣٢،٥٪ علف مركز جاهز حلوب، ٨٪ نخالة، ٣٣٪ زرق دواجن مجفف، ١٪ حجر كلسي و ٠،٥٪ ملح طعام. كما غذيت جدايا الشاهد على عليقة مركزة مكونة من ٣٥،٥٪ شعير، ٤٨،٥٪ علف مركز جاهز حلوب، ١٤،٣٪ نخالة قمح، ١٪ حجر كلسي، ٠،٥٪ ملح طعام. إضافة الى تغذية المجموعتين على دريس الشعير، ولمدة تسعين يوماً.

بلغ متوسط كمية العلف المستهلك باليوم للرأس الواحد من جدايا التجربة (٧٦٢) غرام مادة جافة. وكان معدل التحويل الغذائي (١٣،١٥٧) كغم مادة جافة لكل كغم وزن حي. بلغ متوسط كمية العلف المستهلك باليوم للرأس الواحد من جدايا الشاهد (٩٩٤) غرام مادة جافة، وكان معدل التحويل الغذائي (٧،١٧٢) كغم مادة جافة لكل كغم وزن حي.

**Rangeland and Marginal Land Improvement
Session 11**

Rehabilitation of Marginal Land Using Phosphate and Grazing Management

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Abstract

An experiment began in 1984/85 at Tel Hadya, in northern Syria, to test the hypothesis that the application of superphosphate to non-arable lands (also called marginal lands, because grazing is the only possible use) containing annual legumes would stimulate leguminous growth and reduce nitrogen deficiency, leading to increased herbage production. Phosphate fertilizer was applied in three levels: 0, 11 and 26 kg/ha P every year during a seven-year period (1984-1990). The direct effect of phosphate application in the above study has been observed in imported legume and total herbage yields, and in improved productivity in sheep grazing the pasture. Results also showed that the annual applications of 11 and 26 kg/ha of P raised the Olsen-P values in the soil from approximately seven mg/kg to about 20 to 40 mg/kg, respectively, by the end of the seventh season (July 1991). Since then no more fertilizer has been applied, and the effects of residual phosphate on pasture and animals have been monitored. Significant effects of phosphate have been recorded in the study long after the initial application of fertilizer.

Effects of Phosphorous Fertilization on Range Improvement in Jordan

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Abstract

In Jordan, rangelands (areas receiving less than 200 mm average annual rainfall) comprise about 91 percent (8.1 million hectares) of the total area of the country. These rangelands are characterized by low productivity and suffer from degradation of their natural vegetation cover.

Previous studies elsewhere have shown it is possible to increase range production and enhance legume plants through application of phosphorus fertilizer to the rangeland and thus increase livestock production.

This study was implemented in Jordan as part of the Mashreq Project to study the effect of phosphorus fertilization on rangeland production.

The results of four seasons (1991/1992-1994/1995) of this study show that application of phosphorus fertilizer to rangelands in Jordan has a positive effect on increasing vegetation production, and on enhancing legume plants and increasing their numbers.

Utilization of Fourwing Saltbush for the Arid Rangelands of Highland Balochistan

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Abstract

Balochistan is the largest province of Pakistan, with vast areas of degraded rangelands, often at altitudes above 1000 m. The climate is continental Mediterranean. Fourwing saltbush (*Atriplex canescens*) has shown considerable potential as a forage shrub to supplement the diet of the large population of small ruminants. A number of studies have been conducted on the nutritive value of the shrub fed alone or with supplements to penned and grazing sheep. The paper presents the highlights of the research.

تقييم انتاجية المراعي وتقدير الحمولة الرعوية في البادية السورية

عبد الآله العتر

وزارة الزراعة - تدمر - سوريا

الملخص

نظراً لما للبادية من أهمية في تأمين جزء من حاجة الاغنام للغذاء ، ونظراً لما وصلت اليه من حالات التهور، لذا نفذ هذا العمل المشترك الذي بدأ عام ١٩٨٩ - ١٩٩٠ بين وزارة الزراعة في الجمهورية العربية السورية / مديرية البادية / والمركز العربي للاراضى القاحلة (اكساد) والمركز الدولي للبحوث الزراعية في المناطق الجافة (ايكاردا).

يهدف هذا المشروع الى التوصل الى نتائج واضحة في مجال تحسين المراعي مقارنة مع المراعي الطبيعية اضافة الى محاولة تحديد حمولة رعوية مثلى تناسب حالة المراعي الطبيعية والمحسنه. كما ان هذه الدراسة تثبت لمربي الاغنام أهمية تحسين المراعي والمردود المادي الذي تؤمنه نتيجة زيادة الانتاج مما يرفع دخل الفرد. حيث نلاحظ من النتائج ان انتاج الاغنام من الحليب في المرعى المحسن قد زاد بشكل واضح عن انتاجها تحت ظروف المرعى الطبيعي. كذلك تم تحديد الحمولة المناسبة التي تعطي أفضل النتائج.

كما أن لدراسة حاجة الاغنام من الماء أهمية كبيرة وذلك للاستدلال بها عند تأمين مصدر مائي ليكون هذا المصدر كافي وخاصة في فترات الحر الشديد، وفي المناطق المحسنة والمدخل اليها نباتات جديدة.

The Utilization of Fodder Shrubs (*Atriplex* spp., *Salsolavermiculata*) by Agro-Pastoralists in the Northern Syrian Steppe

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Abstract

In 1972, the Syrian government started an experimental project in the 180-120 mm rainfall zone, looking at the growth and survival rates of shrubs such as *Atriplex* spp. and *Salsola vermiculata*. Simultaneously, a number of pilot private shrub plantations were established with the cooperation of agro-pastoralists. In 1983, a law was passed restricting cultivation of cereals and especially barley in the steppe to 45 ha per family, with the requirement that 30 percent of this land be planted with fodder shrubs as fodder reserves. To implement this, the government provided seedlings to farmers with cereal cultivation licences, and in some cases supervised the planting of the shrub seedlings undertaken by the agro-pastoralists.

In spite of the apparent advantages of fodder shrub reserves in the integration of crop-livestock systems, and individual plantations, few private plantations still exist in northern Syria. Socio-economic studies contributed little to the diets of sheep flocks in areas where many plantations were established during the 1980s.

It is important to understand the reasons for both success and failure in order to reduce natural resource degradation and improve the sustainability of rangeland systems in Syria, and in the Middle East in general. This study presents the results of a 1993 survey in an attempt to answer the following questions: why have most fodder shrubs plantations not survived? How do land users in northern Syria view shrubs, and what management strategies do they use with plantations which still exist?

April 1995 survey of Bedouin Groups With Contracts to Graze the Government Rangeland Plantation at Maragha, Aleppo Province, Syria

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Abstract

This paper presents a summary of the observations, opinions and perceptions of the ten bedouin group heads who signed the first contracts for one-month grazing rights for 12,000 sheep on the Maragha Rangeland Station of the Steppe and Range Directorate of the Syrian Ministry of Agriculture and Agrarian Reform (SMAAR). Maragha is located near the dry southeastern corner of Aleppo province. As this represents the first legal private use of government saltbush plantations in recent years, it is a significant development in Syrian rangeland management.

Answers to a list of open-ended questions were taken in informal interviews with each of the ten contract holders representing groups of bedouin families whose flocks were grazing the Maragha station. This allowed an understanding of the contribution of rangeland to the annual feeding/grazing calendar of each group. Problems and positive ideas for future grazing contracts are summarized.

The renting of government shrub plantations began simultaneously in other Syrian provinces as well in April 1995. New grazing, including other sites, in future collaborative research between ICARDA and SMAAR is explored.

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نقل وتقييم التكنولوجيا

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وزارة الزراعة والاصلاح الزراعي - دمشق - سوريا

الملخص

تهدف عملية نقل التكنولوجيا الى تغيير المكون المعلوماتي لافراد المجموعة المستهدفة سواء في ادارة المزرعة او في سلوك الاسرة الزراعية. ويختلف تقبل التقنيات ودرجات تبنيها حسب عدة خصائص منها: المنفعة النسبية من حيث المردود الاقتصادي والمركز الاجتماعي والشعور بالرضا، وحسب توافق هذه التقنيات مع القيم الثقافية والاجتماعية والمعتقدات والخبرات السابقة والافكار المدخلة سابقاً. وتعلق ايضاً ببساطة هذه التقنيات ودرجة ادراكها، فكلما زاد تعقيد التقنية زاد بطء تبنيها، وكلما كانت قابلة للتحديث على مستوى محدود تكون أسرع تقبلاً من التي لا يمكن تجزئتها والمبنية على اساس (الكل او لا شي). وتعلق انتشار التقنية بقابليتها للملاحظة والاطلاع على استخدام هذه التقنية ومعاينة نتائجها، حيث اتضح بانه كلما زادت الملاحظة ومعاينة النتائج كان الانتشار اسرع، وكلما كانت التقنية تابعة من حاجة الجمهور المستهدف كلما كانت ذات انتشار ومعدل تبني عالي. ولضمان نجاح نقل التكنولوجيا لا بد من تضافر جهود البحث والارشاد والفلاح. ولا بد من وضع خطة بحث تتلاءم مع حاجات الجمهور المستهدف التي يجب على الارشاد ان يمدّها من خلال حاجات الجمهور ومن ثم ايجاد هذه التقنيات والعمل بالتعاون مع الفلاح والمرشد من خلال التجارب التطبيقية لتعريف المجتمع بمحتوى التقنية ونتائجها.

إما عملية التقييم فهي عبارة عن قياس للتغيرات السلوكية لجمهور الارشاد المترتبة على تنفيذ برنامج ارشادي معين، ومدى تحقيق هذه التغيرات للاهداف الموضوعية مع تقدير فاعلية الطرق والمعينات الارشادية المستخدمة للوصول الى هذه التغيرات. كذلك قياس الاثار الاقتصادية والاجتماعية المترتبة على التغيرات السلوكية لجمهور الارشاد.

البحوث في حقول المزارعين

عبد الله خباز

وزارة الزراعة والإصلاح الزراعي - دمشق - سوريا

الملخص

تتلخص اهم الاهداف العامة للبحوث الزراعية في العمل على تحسين معيشة ورفاهية المجتمع عن طريق زيادة الانتاج الزراعي والتقليل من تقلباته. ويتم ذلك من خلال التحسينات والتقنية الاقتصادية لعملية الانتاج الزراعي وتحقيق التغيرات والتحسينات التقنية اما بنقلها (نقل التكنولوجيا) من الدول الاكثر تطوراً وتقدماً او من الدول النامية ذات الظروف المشابهة، على أن يتم اختبارها وتحسينها بما يتناسب والظروف المحلية. او باستنباطها وتطويرها محلياً ويتم هذا من خلال برامج البحوث الزراعية المتنوعة بالتعاون مع الاجهزة الارشادية وصانعي السياسات الزراعية.

هذا وقد تطورت عملية البحث الزراعي بشكل ملحوظ وخاصة خلال الربع الاخير من هذا القرن. حيث أصبح التفكير في المشاكل الزراعية والتعامل معها يتطلق من منظور النظم الزراعية بشموليته وتكامله بدلاً من النظرة الاحادية الضيقة التي اتصفت بها البحوث الزراعية التقليدية. وبعد ان كان الباحث الزراعي يعمل وحيداً داخل محطته بمعزل عن زملائه الباحثين ذوي الاختصاصات الاخرى ومعزل عن الواقع الزراعي (الفلاح) اصبح البحث الزراعي بتبنيه منهج بحوث النظم الزراعية يعتمد على فرق عمل بحثية متعددة الاختصاصات.

في نظام البحوث الزراعية التقليدية كانت الحلول المستنبطة للمشاكل الزراعية تبقى أسيرة الأدراج والخزائن داخل المحطة، حيث كان الباحث يعدم وسيلة نقلها الى الفلاح، أما في بحوث النظم الزراعية فان فريق البحث هو المسؤول عن اختبارها في حقول المزارعين وتعديلها إذا تطلب الأمر بما يتوافق والتغيرات البيئية والاقتصادية والاجتماعية السائدة في المناطق التي استهدفتها عملية البحث، حيث يعمل فريق البحث مع الارشاد الزراعي في نشر التوصيات وتبنيها وقياس مدى قبول المزارعين للتقنيات الحديثة وتطبيقهم لها.

Approaches to Transfer of Technology in Arid and Semi-Arid Environments: the Moroccan Experience

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Abstract

In arid and semi-arid areas, agriculture is predominantly based on rainfed farming and livestock production. Farmers face continuously scarce and highly erratic rainfall, which induces high fluctuations in crop and livestock production. Average yields obtained by farmers are low compared to yields achieved in research stations or by pioneering farmers. This situation indicates the important role of agricultural research in increasing farmer productivity and wealth. To do so, an integrated approach to technology transfer was developed and implemented at the Aridoculture Centre through the Dryland Applied Research Project and the IFAD/ICARDA/AFESD Project. This approach integrated researcher, farmer and extension. This study highlights the need for institutionalization of an integrated approach to technology development, evaluation and the adoption process in Morocco.

The Mechanism of Feed-Block Technology Transfer to Manufacturers and Sheep Owners

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Abstract

This study aimed at developing a model for the methodology of technology transfer adopted by the IPA Agricultural Research Center in Iraq. The methodology was based upon that utilized by the Mashreq Project. The model is presented by way of discussion of the application of feed-block technologies through Mashreq Project activities in northern Iraq from 1992 to 1995.

The methodology consists of the seven following stages: (1) Research, development and improvement of alternative feed ingredients; (2) Testing research findings at various research and production stations; (3) Verification of research findings on sheep owners' fields under the direction of the research team; (4) Production of the feed-blocks at the production unit on a large scale; (5) Demonstration of the new technology on sheep owners' fields under the supervision of the agricultural extension team; (6) Expansion of production through contracting with private firms and agricultural companies; and (7) Large-scale adoption and dissemination of the new technologies through provision of inputs and technical support. The study concludes with a discussion of the coordination between IPA and the Ministry of Agriculture to expand feed-block production by private firms and its use by sheep owners throughout the country.

Adoption of Barley Production Technologies in Iraq: A Farm Level Analysis

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Abstract

This paper analyzes the main components of the adoption of barley production technologies using cross-sectional data of farmers under rainfed conditions. A total of 250 farmers were interviewed. The farmers are classified according to type of participation: participants in demonstrations (58 farmers); neighbors and/or participants in field days (95 farmers), and non-participants (97 farmers).

Among the sample farmers, 52.4 percent of them adopted improved cultivar and/or fertilizers. All farmers participating in project demonstrations have adopted the introduced technologies, while 37 percent of neighbors and non-participant farmers adopted only fertilizers. Both Probit and Logit models were used to estimate the relationship between adoption rate and the degree of adoption. The intensity of adoption was analyzed using multiple linear regression model. Results show that farm size and profitability are the most significant factors affecting the three indicators of adoption. The predicted probabilities of adoption at the mean values of explanatory variables are 0.252 and 0.533 for Probit and Logit models, respectively.

Adoption of Improved Barley Production Technologies in Syria

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Abstract

This paper reviews the progress made in transferring improved barley production technologies to Syrian farmers. The review is based upon the results of a survey conducted with 138 barley farmers following the 1994 harvest. The sample was stratified according to degree of participation in the project and included farmers hosting demonstrations of improved technology during the project period, their neighbors and participants in field days, as well as farmers who did not participate in any Mashreq Project activities.

The results show that the project was successful in meeting its objectives: use of improved technologies greatly increased among participating farmers, and the rate of increased adoption was much greater among participating farmers than among non-participation farmers during the project period. Although most farmers expressed a willingness to adopt new technologies, their actual adoption of individual components of the full package varied. They found some components easier to adopt than others, and the results indicate the constraints remaining to adoption of the full package.

The impact of the project was greatest in terms of increased use of improved cultivars and lowered seed rates. Impact in use of fertilizer and seed drills was less, because there were reasonably high rates of use of these two technologies before the project began and because increased use is primarily constrained by cost considerations. In contrast, factors constraining increased use of improved cultivars include lack of farmer knowledge about them, seed availability, and some preference considerations regarding grain color. Cost is not an issue. Lower seed rate is similar in that most farmers have little experience with the recommended lower rates, but those experimenting with lower rates tended to adopt them. Reduced rates are encouraged by the immediate economic benefit of saving seeds.

Full discussion of the factors influencing technology adoption, responses to individual components, and farmer perceptions leads to a number of recommendations to enhance the efficiency and effectiveness of future technology transfer activities.

Impact of Technology Transfer on Cereal Production in Tunisia

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Abstract

Technology transfer involves a great deal more than simply the production of new technology or technological packages. The new technology that is implemented ought to contribute to the increase of sustainable food production in such a way that both the nutritional level and the general economic well-being of low income farmers are improved. Concerns for efficiency, equity and the environment are explicit. Another important aspect is research on resource management aimed at attaining balanced production systems at moderately high levels of productivity.

In Tunisia, the implementation of new technology has resulted in significant production increases. Varietal improvement has contributed significantly to this increase in production. A large number of new wheat varieties have been grown in Tunisia during the last 25 years. Twelve bread wheat varieties have been commercially grown for different periods; some lasted for two crop seasons (Tobari), while others are still being cultivated (Ariana, Dougga). The same applies to durum wheat. Nine varieties were commercially grown all over the country; Badri lasted two crop seasons, whereas INRAT 69 is still being cultivated. Barley varietal development has not been well supported in Tunisia. Cultivars Feiz, Tej, and Roho, all released in 1982, were grown for only for a short period of time and since 1986 have been replaced by Rihane. With the new wheat varieties there has been a steady increase in yield per hectare. The current average yield for wheat is greater than 1500 kg/ha, compared with approximately 500 kg/ha during the 1960s.

The improved varieties quite often lose their advantage of yield potential if appropriate management techniques are not implemented. The combination of improved crop management techniques and better adapted varieties has produced an increase in production levels, particularly in semi-arid regions. A net increase in durum wheat yield was observed in association with nitrogen and weed control applications.

Important technological developments that contributed to increased crop production include the use of fertilizers, weed control, high yielding varieties and improved cultural practices. In addition, the availability of research funds and the training of scientists have both played a major role.

Constraints to the Adoption of New Barley Varieties in the Province of Khouribga, Morocco

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Abstract

Barley is a major crop in the province of Khouribga. Studies on the province's cropping systems indicate a limited adoption of new barley varieties. The objectives of this study were to (1) determine the extent of adoption of new barley varieties in the province; (2) to identify the major constraints to the adoption of such varieties, and (3) to assess farmer opinion regarding new barley varieties. The sample of the study consisted of 88 farmers. The results revealed that the level of adoption of new barley varieties in the province is quantitatively and qualitatively higher than what has been indicated in previous studies. Seventy-six percent of surveyed farmers cultivated new barley varieties and 36 percent of their total barley area were sown to such varieties. High grain yield, early maturity, resistance to lodging, and high quality grain for human consumption were the most appreciated characteristics of new barley varieties. According to the farmers, the disadvantages of new barley varieties centered around their low straw yield, poor grain quality for animal feeding, and unsuitability for green-grazing compared to local barley varieties. The major constraints identified by farmers were the lack of local seed and high prices of certified seeds.

Technological Change Bias of Barley Production Technology in Jordan

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Abstract

The bias of technological change is caused by differential rates of change in the marginal productivities of factor inputs. The importance of measuring the technological bias stems from the fact that it measures which factor of production produces relatively more through technological change. Cross-sectional data were used to investigate the nature of barley production technology in Jordan. The study analyzes the primary farm level data which was collected in Jordan for cropping season 1989/1990. A random sample of 311 barley farmers was used in the rainfed areas to examine the sources and directions of technological change biases of new production technology. A primal measure of technological change bias was estimated by using a translog production function with constant returns to scale specification.

Results for the nature of technological bias for all technologies show that new varieties are land-saving and fertilizer-using. It is known that the new varieties require other new inputs like chemical fertilizers. New varieties and early planting seem to be capital-neutral, whereas machinery is land-saving and capital-using. However, the application of herbicides, as expected, is capital-saving. The machinery is family and hired labour neutral. In general, the technological package introduced into the Jordanian barley farming system is fertilizer-using, land-saving and family labour-saving.

3Sequential Adoption of Divisible Technologies in in Barley Production in Jordan

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Abstract

New agricultural technologies are usually promoted as a mechanical-biological-chemical-agronomic package of practices. Nevertheless, many farmers adopt components of these packages rather than the entire package. Farm-level data collected from a sample of 311 barley farmers in the rainfed farming areas were used to investigate the effects on output of sequential adoption of new technologies. The translog models with non-homothetic and non-neutral technological change specification were developed to quantify the effects of the introduction of the new production technology. Different functional hypotheses were tested. The restriction of homotheticity and homogeneity, and linear homogeneity cannot be rejected, Hick's neutral technological change and Cobb-Douglas' specification cannot characterize the production technology. Therefore, the most restricted and acceptable model is linear homogeneity specification. This model was used to characterize the rainfed barley production technology in Jordan.

The adoption of drill machinery without adopting other components increases production by 5.7 percent, whereas the adoption of new varieties increases production by 3.2 percent. Adopting new varieties with machinery increases production by 7.9 percent. If the farmer decides to adopt the entire package, an increase in total output of 24.2 percent is expected in Zone I. The effect of the adopted components vary from one agro-climatic zone to another. Barley production increased by 31 percent and 74 percent for farms located in Zone II and Zone III, respectively, compared to Zone I.

The Impact of Government Subsidy Policy on Barley Production in Jordan (PAM Approach)

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Abstract

Barley is a strategic crop in Jordan because of its relative importance in the feed rations of livestock and poultry. Barley yields are low and the area planted with barley is limited.

The main objective of this study is to highlight the impact of Government subsidy policy on barley production in Jordan. Primary and secondary data were used in this study, and a policy analysis matrix (PAM) was used. Enterprise budgets, market and international prices were needed in the analysis. Also, economic protection measures were used in the analysis.

The study's results indicate that the subsidy of the locally produced barley amounted to 40 JD\1 ton of barley. Also, the results indicate a comparative advantage for both traditional barley production and barley production using new technology. The Irbid Governorate has a comparative advantage in producing rainfed barley using traditional production practices and new technologies. There is no comparative advantage in producing irrigated barley in the Jordan Valley and in the southeast of the kingdom (Diesah and Mudawwarrah).

The results of the study indicate a cost of 1.40 JD\1 ton of barley for all kinds of fertilizer, except DAP, which is produced locally. DAP is subsidized at 1.70 JD\1 ton of barley. Chemicals are also subsidized for 0.66 JD\1 ton of barley.

The results show no impact on the price policy on manual and machinery labor and on seeds. However, water for barley in the Jordan Valley is subsidized at 11.30 JD\1 ton of barley. In Diesah and Mudawwarrah the subsidy for water amounted to 38 JD\ ton of barley or about 65 fils\1 m³ of water.

The Contribution of Women to Labour and the Decision-Making Processes in Bedouin Farming Systems in Northern Syria

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Abstract

Labour constraints, missing financial incentives and income control lead to different evaluations of innovations and technologies by women and men, influencing their interest and adoption. The present study identifies the roles of male and female family members in labour and decision making processes at the family household and farm levels. The identification of their roles and contributions to small ruminant production and management of three defined bedouin farming systems can help extension and research institutions to address the appropriate household members involved in decision making and carrying out activities, and to define their work within the context of gender issues.

The three described farming systems differ in population, cultivated area, off-farm income and degree of sedentarization. The absence of male family members in off-farm activities increases the workload and responsibilities of female family members. It also increases women's contact with the market and thereby allows them some control over household expenditures. In all three farming systems, women are responsible for fodder mixing and supplementary feeding of the flock. Their expertise should be considered in efforts by research and extension personnel to improve the feeding management of flocks. The milk marketing system could be improved to ease women's workload during milking season. Women of the transitional and pastoral systems spend significant time uprooting shrubs for firewood and cooking. This would indicate both poor living conditions and a negative environmental impact on the rangelands, in addition to those of overgrazing and barley cultivation.

Sheep Nutrition on Atriplex Based Ranges

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Abstract

Seasonality of forage availability is an inherited problem of the arid and semi-arid areas where feed resources in the dry season are extremely low. Many Arab Countries in North Africa, East-Mediterranean and the Gulf carried out projects for Atriplex spp. plantations to create feed reserves for the dry season. Summer growth of Atriplex with their high content of nitrogen and minerals gave reasonable advantages for these shrubs. The nutritive value and palatability of Atriplex spp. is estimated between moderate to low. The poor performance of sheep on pure Atriplex ranges indicated that Atriplex spp. cannot be used as a sole diet for sheep.

A five year project carried out by ACSAD showed that low feed intake and digestibility, low content of readily available carbohydrates and mineral imbalance are the main problems related to sheep nutrition on Atriplex spp. Therefore, the annual vegetation cover, under story, in Atriplex ranges alleviates some of these nutritional problems. Quantity and quality of feed supplementation to Atriplex ranges were determined. Barley grains and wheat bran, 200 and 100 g/head/day, improved considerably the nutritive value of Atriplex and realized a high performance for lamb growth as well as pregnancy and milk production for ewes.

Economic evaluation of Atriplex plantations showed that the internal rate of return (IRR) was high being 25 and 19 percent for Atriplex ranches with or without feed supplementation, respectively. Moreover, the respective benefit-cost ratio was 3.9 and 1.3. It was suggested that establishing Atriplex ranches in the arid zone is advantageous where the owner gets back his investments within the first five years of the project.

