

IRAQ-ICARDA-ACIAR
Project (CIM/2004/024)

Better crop germplasm and management for improved production of wheat , barley, pulse and forage legumes in Iraq.

By
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Objectives of legume introduction:

- **1: to increase the productivity of wheat and barley by introducing legumes in crop rotation.**
- **2: to introduce forage legumes to increase forage production.**

Introduction

- The crop rotation in the area of limited rainfall area(200-350mm.) is cereal (barley)/fallow.
- Fallow means leave half of the land idle exposed to soil erosion by rain and wind .
- In addition ,the economic losses by leaving half of the land without cultivation .
- The area of this region is about 1 million hectare . in order to overcome the fallow system , introducing forage legumes may be the solution to solve the fallow problem .

Introduction

- Hoping to increase cereal productivity mainly barley and availability of forage recourses of sheep grazing.
- Under moderate rainfall area (350-450mm.). The different crop rotation is practiced.
- Cereal (wheat)/ food legumes, as lentil and chickpeas. The area of this region is about 0.5m.hectar . In recent years some attention has given to develop this area through introducing forage legumes as common vetch (*Vicia sativa* L.) or lathyrus (*Lathyrus sativus*) aiming for seed production which is the main source of protein 24% contributing about 10% percent in sheep diet or hay making(mixture of 75% vetch with 25% barley)

Materials and Methods

- Forage legumes activities were carried out under limited rainfall area(200-350mm.)as Hatra , Tel-Abta and Mahalabia locations. These activities represent a mixture of two-rowed black local barley with common vetch (*Vice sativa* L.cv.IPA2001) at a ratio of 3:1(75 %common vetch with 25%barley).It means 100kg/ha for common vetch and 20kg/ha for barley. An area of 1 hectare was allocated for each activity for each location . the land was ploughed and cultivated by local machines (drill disk). Date of sowing was 20,20,25th.Dec.2006 for Mahalabia, Hatra, and Tel-Abta locations respectively .

Materials and Methods

- But under moderate rainfall area (350-450mm.) different activities were conducted as Telkief, Hamdanyia , and Bashiqa locations .These activities included cultivation of 1 hectar of each common vetch (*Vicia sativa* L.cv.IPA 2001) and woollpod vetch (*Vicia dasycarpa*.cv. kouhak 96) at Telkief , Hamdanyia, and Bashiqa locations ,in addition to that,0.5 ha was cultivated with *Lathyrus sativus* cv.Ali –Bar at Telkief and Hamdanyia locations Seeding rate of common vetch and woollypod was 100kg/ha .

Materials and Methods

- Mixture of 75% common vetch cv. IPA 2001 with 25% two rowed black barley was conducted at Hamdanyia . The land was ploughed by chisel and was seeded by local machines. Seeding rate was 120kg/ha for *Lathyrus*. Date of sowing was 18,20,19 th.Jan.2006 for Telkief , Hamdanyia and Bashiqa respectively. Dry matter yield was estimated at flowering time by quadrat(1X1m.) repeated 10 times for each activity at each location then dried in the oven at 75 C° for 48 hrs.

Table(1): The amount of rainfall (mm.) and its monthly distribution for the growing season 2006/2007 at different locations:

| months | Limited rainfall area | | | Moderate rainfall area | | | |
|----------|-----------------------|--------------|-------|------------------------|-----------|---------|-----------------|
| | Mahalabia | Tel- Abta | Hatra | Telkief | Hamdanyia | Bashiqa | Mosul centre |
| October | 102 | 38 | 33 | 43 | 63 | 19 | 27 |
| November | 3 | 27 | - | 40 | 23 | 15 | 10 |
| December | 30 | 17 | 11 | 53 | 30 | 34 | 45 |
| January | 29 | 22 | 23.5 | 32.5 | 37 | 26 | 23 |
| February | 66 | 61 | 35 | 68.5 | 142 | 44 | 81 |
| March | 14 | 13 | 4.5 | 34 | 40 | 23 | 31 |
| April | 29 | 9 | 7 | 35.5 | 40 | 37 | 34 |
| May | - | - | - | - | 46 | - | 7 |
| | 273 | 187 | 114 | 306.5 | 381 | 198 | 258 |

Source: Ninavah Agriculture Directorate

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Results and Discussion

- Data presented in table (2) showed some differences in dry matter yield between the three locations, Tel-Abta, Hatra and Mahalabia, where dry matter yield was increased at Mahalabia location by 74% and 98% over Hatra and Tel-Abta, respectively. These differences were due mainly to the amount of rainfall (Table1)

Table(2): Mean of dry matter yield of mixture (kg/ha) , height of plant (cm.) of common vetch and its utilization at three locations for the growing season 2006/2007

| Characters | Locations | | |
|---------------------|------------------------|----------------|-------------------|
| | Tell- abta (187mm.) | Hatra (114mm.) | Mahalabia(267mm.) |
| Dry matter Yield | 201 | 176 | 350 |
| Height of plant | 8 | 8 | 12 |
| Utilization | Sheep grazing | Sheep grazing | Sheep grazing |

Results and Discussion

- Cultivation of common vetch under limited rainfall area is risky because of the fluctuation of the amount of rainfall between years .There is common sense between the farmers or growers working under this area that cultivation is considered as somebody playing cards . As the farmer is used to get yield once per four years even for cereal crops as barley .
- According to the previous results , conclusion should be made here ,that there is no chance to continue with the cultivation of common vetch under limited rainfall area(200-350) because it is economically unworthy.

Results and Discussion

- 2: Under moderate rainfall area:
- Results in Tables (3,4) showed trend to some difference in dry matter, biological and seed yields between *Vicia sativa* L. and *V.dasycarpa* Ten. within the two locations and between the two locations Telkief and Bashiqa . The values of *V.sativa* L. and *V.dasycarpa* Ten. tended to be higher at Telkief location than at Bashiqa location . Also ,there was activity of *Lathyuas sativus* cv. Ali –Bar. Results are presented in Table (3) .

Results and Discussion

Table (3): Mean of dry matter, biological and seed yields(kg/ha) and height of plant (cm) of vetches and lathyrus at Telkief location for the growing season 2006/2007

| Species | Dry matter yield | Biological yield | Seed yield | Height of plant |
|----------------------|-------------------------|-------------------------|-------------------|------------------------|
| Vicia sativa L. | 891 | 2905 | 780 | 30 |
| Vicia dasycarpa Ten. | 658 | 2611 | 591 | 34 |
| Lathyrus sativus | 838 | 3372 | 856 | 32 |

Results and Discussion

- Also ,Tables(3,4) showed values of height of plant for the species under study at Telkief and Bashiqa locations. These differences between vetch species and lathyrus were due mainly to the differences in the amount of rainfall and its monthly distribution (Table1).
- Results of Hamdanyia location is omitted because of the spread of weeds extensively especially broad leaves . it was difficult to control it.

Research Report

Comparison between 16 lines of common Vetch(*Vicia sativa* L.) at AL-Rashidiya research station for the growing season 2006/2007 .

| Lines | DFLR days | DMAT days | PTHT(cm.) | YLD(2.1m2) | BYLD(2.1m2) | Wt100 seed(gms.) |
|-------|-----------|-----------|-----------|------------|-------------|------------------|
| 1 | 124 | 159 | 49 | 329 | 671 | 5.95 |
| 2 | 130 | 162 | 16 | 67 | 221 | 2.95 |
| 3 | 133 | 168 | 58 | 297 | 814 | 4.10 |
| 4 | 122 | 160 | 42 | 284 | 643 | 5.75 |
| 5 | 135 | 170 | 49 | 176 | 345 | 5.20 |
| 6 | 133 | 167 | 40 | 216 | 695 | 4.30 |
| 7 | 127 | 160 | 46 | 344 | 801 | 5.10 |
| 8 | 134 | 170 | 41 | 184 | 307 | 4.40 |
| 9 | 124 | 160 | 39 | 226 | 493 | 5.15 |
| 10 | 134 | 169 | 46 | 232 | 380 | 4.85 |
| 11 | 133 | 169 | 41 | 207 | 446 | 5.10 |
| 12 | 132 | 161 | 46 | 193 | 398 | 6.05 |
| 13 | 135 | 169 | 41 | 196 | 404 | 5.25 |
| 14 | 131 | 167 | 39 | 208 | 463 | 5.71 |
| 15 | 126 | 163 | 42 | 212 | 316 | 6.75 |
| 16 | 121 | 153 | 30 | 284 | 471 | 5.60 |

| Selected lines | DFLR (days) | DMAT(days) | PTHT(cm.) | YLD(2.1 m²,gms) | BYLD(2.1 m²,gms) | Wt100 seed (gms) |
|-----------------------|--------------------|-------------------|------------------|-----------------------------------|------------------------------------|-------------------------|
| 1 | 124 | 159 | 49 | 329 | 671 | 5.95 |
| 4 | 122 | 160 | 42 | 284 | 643 | 5.75 |
| 7 | 127 | 160 | 46 | 344 | 801 | 5.10 |
| 9 | 124 | 160 | 39 | 226 | 493 | 5.15 |
| 12 | 132 | 161 | 46 | 193 | 398 | 6.05 |
| 14 | 131 | 167 | 39 | 208 | 463 | 5.71 |
| 15 | 126 | 163 | 42 | 212 | 316 | 6.75 |
| 16 | 121 | 153 | 30 | 284 | 471 | 5.60 |

DFLR: days from sowing to 50% flowering

DMAT: days from sowing to maturity

PTHT: height of plant (cm.)

YLD: seed yield (2.1m²,gms)

BYLD: biological yield (2.1m², gms)