Effect of planting date and concentrations of Basegran herbicide on growth and yield of Faba Bean and the accompanying weeds.

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ABSTRACT.

The experiment was carried out during Agricultural season 2019-2020, Field crops Department research station / University of Mosul, planting date (7 November , 7 December , and 7 January) and four doses of Basgran herbicide (control , 187.5 , 375 , 750 ml.h^{-1}).The experiment was applied according factorial experiments (split plots) using the Randomize complete Block Design (planting date at the main plot and the herbicide doses at the sub plots .Using the Spanish variety , the herbicide was sprayed in the last week of February , Weeds samples were taken at mid of April , while the crop sample taken at the first week of May . The data was analyzed according factorial experiment (split plot) using Randomize Complete Block Design , Duncan test was using to compared among the treatments .Planting dates significantly affected the number of narrow weeds, the number of narrow weeds decreased at the second and third dates compared with first date by 28.1 and 30.65% respectively. Planting dates are different at their effect on Number of broad- leaves weeds, planting date 7 January superior in decrease number of broad-leaves weeds compared with second and third planting date by (74 , 92.44). Third planting date are superior significantly compared with the first planting date at decrease the dry weight of broad leaves weeds by 10.19 %, while non-significant different compare with second planting date. non-significant difference among the planting dates at effect on dry weight of broad leave weeds. The first planting date superior at most the traits of growth and yield of crop, high plant (85.8167 cm) , number of pods (7.80), number of seeds .pod^{-1} (5.31 seed . pod^{-1}), weight of 100 seed (130.43 gram). and (410.58) g.m^{-2}. All herbicide doses effect in decrease the narrow and broad leaves weeds, dose 750 ml.h^{-1} superior at decrease the narrow leave weeds and their dry weight (17.89) and (53.42) g.m^{-2}, the dose (375 and 750 ml.h$^{-1)}$ superior on the dose 187.5 ml.h^{-1} significantly at decrease the number of broad leaves weed (4.44 , 4.30 plant. m^{-2}). All traits of growth and yield of ***Vicia faba* L**. are significant superior at the treated with doses 375 ml.h^{-1} of Basegran herbicide except plant high which was high value at control treatment , (8.91) pot.m^{-2} of number of pots, (7.13 seed .pot^{-1}) of number of seed .pot, (146.80) g. m^{-2} of weight of 100 seed,(490.42 gram. m^{-2}) of seeds yield. Interaction between planting date and herbicide doses taken significant results at weed control whether broad leaves weeds and the dry weight, the doses of herbicide (375 and 750 ml.h^{-1} with third planting date (7 January) superior at decrease the traits of weeds , while the dose 375 ml. h^{-1} with the date 7/11 and 7 /12 of most traits of growth and yield.

Key word: Basagran herbicide ,Fabaceae, , Weed control.

البحث مستل من رسالة ماجستير للباحث الاول. تأثير مواعيد الزراعة ومبيد البازكران في نمو وحاصل الباقلاء *Vicia faba* L.والادغال المرافقة

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الخلاصة

نفذت تجربة حقلية خلال الموسم الزراعي 2019-2020 في محطة ابحاث قسم المحاصيل الحقلية/ كلية الزراعة والغابات/ جامعة الموصل, تضمنت التجربة عاملين العامل الاول مواعيد الزراعة (7 تشرين الثاني ,7 كانون الاول و7 كانون الثاني), والعامل الثاني تضمن ثلاثة تراكيز من مبيد البازكران بالإضافة الى معاملة المقارنة (بدون مبيد, نصف التركيز الموصى به 187.5مل.هـ$^{-1}$, التركيز الموصى به 375 مل.هـ$^{-1}$ و ضعف التركيز الموصى به 750 مل.هـ$^{-1}$), طبقت التجربة وفق نظام الالواح المنشقة بتصميم القطاعات العشوائية الكاملة اذ اشتملت الالواح الرئيسية مواعيد الزراعة, والالواح الثانوية تراكيز المبيد. تم رش

المبيد في نهاية شهر شباط واخذت عينات الأدغال في بداية شهر نيسان, بينما اخذت عينات الحاصل في بداية شهر ايار, تم تحليل البيانات احصائياً وفق نظام التجارب العاملية (الالواح المنشقة) وبتصميم القطاعات العشوائية الكاملة R.C.B.D وباستخدام اختبار دنكن المتعدد المدى للمقارنة بين المتوسطات . يمكن تلخيص النتائج التي تم الحصول عليها كالآتي, اظهرت مواعيد الزراعة تأثير معنوي في صفة عدد الادغال الرفيعة الاوراق إذ انخفض عدد الادغال الرفيعة الاوراق في موعدي الزراعة الثاني والثالث (12/7 و 1/7) مقارنة مع موعد الزراعة الاول (11/7) وبنسبة (28.1 و 30.65٪) على التوالي , تباينت مواعيد الزراعة في تأثيرها في عدد الادغال العريضة الاوراق, إذ تفوق الموعد الثالث (1/7) في خفض عدد الادغال العريضة الاوراق مقارنة مع الموعد الاول والثاني (11/7 و 12/7) وبنسبة (74 , 92.44 ٪). لم يكن لمواعيد الزراعة تأثير معنوي في صفة الوزن الجاف للأدغال الرفيعة, تفوق الموعد الثالث للزراعة (1/7) معنويا على الموعد الاول (11/7) في خفض الوزن الجاف للأدغال العريضة الاوراق وبنسبة (10.19 ٪) ولم يختلف معنويا مع الموعد الثاني (12/7). اثرت مواعيد الزراعة معنويا في صفات نمو وحاصل الباقلاء, إذ تفوق الموعد الاول للزراعة (11/7) في تسجيل اعلى القيم لمتوسطات صفة ارتفاع النبات (85.8167 سم), عدد القرنات (7.80 قرنة/نبات), عدد البذور بالقرنة (5.31 بذرة.قرنة$^{-1}$), وزن 100 بذرة (130.43 و 131.77 غم), تفوق الموعد الاول للزراعة (11/7) في حاصل للبذور وبشكل معنوي والذي بلغ (410.58 غم.م$^{-2}$) مقارنة مع الموعدين الاخرين, اثرت جميع تراكيز مبيد البازكران بشكل إيجابي في خفض صفات الادغال إذ تفوق ضعف التركيز (750مل.هـ$^{-1}$) في خفض عدد الادغال رفيعة الاوراق ووزنها الجاف, لتصل الى اقل قيمة معنوية مقارنة مع باقي التراكيز ومعاملة المقارنة والتي بلغت (17,89نبات.م$^{-2}$) و (53.42 غم.م$^{-2}$), و عدد الادغال عريضة الاوراق/ موقع الموصل (4.44 و 4.30 نبات. م$^{-2}$), تفوقت جميع صفات النمو وحاصل نبات الباقلاء وبصورة معنوية عند المعاملة بالتركيز (375 مل.هـ$^{-1}$) من مبيد البازكران باستثناء صفة ارتفاع النبات التي كانت اعلى قيمة عند معاملة المقارنة عدد القرنات (8.91 قرنة.م$^{-2}$) , عدد البذور بالقرنة (7.13 بذرة.بقرنة$^{-1}$), وزن 100 بذرة (146.80 غم.م$^{-2}$), حاصل الحبوب (490.42 غم.م$^{-2}$). حقق التداخل بين مواعيد الزراعة وتراكيز مبيد البازكران نتائج ايجابية في مكافحة الادغال الرفيعة والعريضة الاوراق واوزانها الجافة وزيادة قيم صفات النمو والحاصل ومكوناته, تفوق التركيز (375 و 750 مل.هـ$^{-1}$) مع الموعد الثالث للزراعة (1/7) في خفض معظم صفات الادغال, بينما تفوق التركيز (375 مل.هـ$^{-1}$) مع موعدي الزراعة الاول والثاني (11/7 و 12/7) لأغلب صفات النمو والحاصل.

الكلمات المفتاحية: مبيد البازكران, العائلة البقولية, مكافحة الادغال.

Introduction

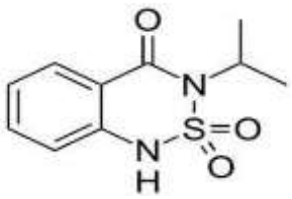
The legume crop Faba bean (*Vicia faba* L.) is one of the important winter crops of the Fabaceae, because it is one of the crops rich in protein by (25 - 48%) and also millions of people feed on it, especially poor Asian countries as well as East and North Africa, Karkanis et al. (1) . The Faba bean crop is also the fourth most widespread type of legumes after Faba bean, chickpeas and lentils, FAOSTAT (2), as its seeds contain essential amino acids such as lysine, leucine and arginine, as well as their high content of carbohydrates and minerals needed to build bones and important vitamins that humans need, Yacop and Yousif (3). The total production in the world in 2019 was about 4.5 million tons, out of 2.5 million hectares , FAOSTAT(2). As for Iraq, the cultivation of pollinators is spread in the governorates of Nineveh, Al-Tamim, Babel and Baghdad, as the cultivated area reached about 5,000 hectares, with a production rate of approximately 2.8 tons.ha^{-1}, Ministry Of Agriculture (4). The weeds is considered one of the main problems facing the agricultural sector in terms of quantity and quality in the world, as the percentage of crop losses caused by the weed ranges approximately from (40-60%) of the economic outcome according to the type of crop grown as well as environmental conditions through competition for light, moisture, nutrients and the place where She lives in it, Antar and Mahdi5))and Sultan and Jasim (6). The use of chemical herbicides in weed control is one of the methods used to increase the productivity of agricultural crops because they are highly efficient in eliminating weeds and also have a specialized nature in combating weed species without causing any harm to the crop compared to other methods of control (mechanical and biological) as well as The ease of use of herbicides and their low costs, which makes them the best control method , Deressa and Girma (7). Sowing dates are closely related to the yield and its components, as there was a loss in the yield amounting to 50-62% when sowing at late dates, Thapa et al. (8). Therefore, planting the crop at the ideal time is necessary to achieve the highest outcome because the planting date depends on environmental conditions and is considered an important agricultural management factor that farmers must control depending on the prevailing environmental conditions, Tahir et

al. (9). Early planting dates produce weak plants with a weak root system because the temperature is higher than the optimal limit leads to irregular germination due to the death of the embryo after germination. As for late planting dates, the growth of plants is slow due to lower temperatures than the optimal limit, either when choosing the date The ideal for cultivation gives better growth and thus the fullness of the grains is better, and this is reflected positively on the final yield, Moosavi (10).This study was carried out using planting dates and concentrations of the Basagran herbicide with the aim of: Comparison between planting dates and choosing the appropriate date that increases the productivity of the harvest of legumes, Determining the best concentration of herbicide basegran in limiting the growth and spread of the weeds associated with the crop of beans.

Materials and Methods

The field experiment was carried out during the winter season 2019-2020 at the Research Station of the Field Crops Department / College of Agriculture and Forestry / University of Mosul. With the aim of finding the best planting date and the best concentration of Basagran in controlling the growing weeds in the fields of Faba Bean crops and the effect of different concentrations of the herbicide on growth and yield. The experiment was applied according to the split Plot experiments system, by Randomized Complete Block Designing with three replications. Experiment factors, the first factor, three planting dates for the crop of legumes and Four concentrations of Basagran. The experiment was carried out during the winter season 2018-2019, after the rains fell, the soil was plowed, then smoothed, and divided into lines, and the distance between one line and another was 30-35 cm, and then divided into three main pieces for appointments, then the experiment land was divided into blocks. Each block was divided into four transactions. For herbicide concentrations, the area of one treatment was 14 m². The seeds of Faba bean (Spanish variety) were sown for the first date and for the two signatories on (7/11/2019) and for the second date (7/12/2019) and for the third date (7/1/2020) in hole, where the distance between one hole and another was 25-30 cm. Put two seeds in one hole. The Basagran herbicide was sprayed on 2/27/2020 at 3-4 leaf stage for weed plants according to the above mentioned concentrations (0, 187.5, 375, 750) ml.ha^{-1}. The treatments were sprayed when the height of the plant was approximately 35 cm, as well as keeping the spray from reaching the neighboring treatments by creating barriers between the treatments. I took data weeds In the beginning of the month of April, using the wooden square, the area of which is (0.5 x 0.5) m ^{2}, they were dried under sunlight until the dry weight was stable, and the data on the yield were taken after the crop had ripened at the beginning of May. The studied qualities. The following characteristics were studied and that is by taking five random plants from each experimental unit and according to the rate, they have the following characteristics: Number of narrow-leaves weeds, Dry weight of narrow-leaves weeds (g), Number of broad-leaved weeds, Dry weight of broad-leaves weeds (g), Plant height(cm), Number of pods / plant: Number of seeds / pod, Weight of 100 seeds (g), Seed yield (g / m2). The data was analyzed statistically after collecting, arranging and classifying the data for all the studied characteristics according to the global experiments system (split plots) and by the Randomized Complete Block Designing RCBD , Al-Rawi and Khalaf allah (11), with the help of computer programs SAS (Statistical Analysis System) and Microsoft Office Excel, as the dates of cultivation were occupied. The main plots and the concentrations of the herbicide are the secondary plots and have three repetitions. A multi-range Duncan test was used to compare averages as different parameters were marked with different alphabets.

الصيغ الجزيئية للبازكران: $C_{10}H_{12}N_2O_3S$ ، التركيب الكيميائي:



The most important weeds widespread in the experiment site

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Leaf shape	Scientific name	English name	Local name
Broad-leaves	*Beta vulgaris* L.	Wild beets	سليجة
Broad-leaves	*Melilotus indicus* L.	Sweet clover	حندقوق
Broad-leaves	*Malva rotundifolia* L.	Buttom weed	خباز
Narrow-leaves	*Avena fatua* L.	Wild oats	شوفان بري
Narrow-leaves	*Lolium rigidum* Gaud.	Rigid ray grass	حنيطة
Broad-leaves	*Silybum marianum* L.	Milk thistle	كلغان
Narrow-leaves	*Lolium temulentum* L.	Annual darnel	رويطة
Broad-leaves	*Ammi majus* L.	Common Bishop's weed	زند العروس
Broad-leaves	*Convlvlus arvensis* L.	Field bind weed	مديد
Broad-leaves	*Medicago hispida* L.	Bur clover	كرط

Result and Desiccation

Characteristics weeds:

1- The results of the table(1) indicate that there are significant differences between planting dates in their effect on the characteristic of the number of narrow-leaves weeds associated with the harvest of weeds, as the second and third dates (7/12 and 7/1) surpassed the first date (7/11) in reducing the number of narrow-leaves weeds. The percentage of decrease was (28.1 and 30.65%) respectively, and the reason may be due to the favorable environmental conditions in the early dates, especially the temperature that encourages the germination of the largest number of weeds seeds compared to the late dates when the temperatures are low and which limit the germination of weed seeds. This is consistent with what has been reported by Mekky et al. (12) and El-Metwally et al. (13). The results in the table(2) indicate that there was a significant effect of all the herbicide concentrations used in the experiment on the decrease in the number of narrow-leaves weeds compared to the comparison treatment, but when using the double concentration (750 ml.ha^{-1}), the highest percentage decrease in the number of weeds was given compared to the comparison treatment, as the decrease was 171.45%), followed by the recommended concentration (375 ml / ha) (107.16%), then half the concentration (187.5 ml / ha) at (16.53%), the reason for this may be due to the nature of the mode of action of the basegran herbicide in the control of narrow-leaves grassland weeds, as it is one of the herbicide s that kill the vegetative parts above the soil surface as a result of the rapid absorption of the herbicide by the weeds, and this result is consistent with what was found , Khajehpour (14) and Mukhtar and Elamin (15) indicated that the numbers of narrow-leaves weeds decreased as the concentration of the herbicide increased. Interaction between planting dates and herbicide concentrations had a significant effect on the number of the narrow-leaves weeds, as all treatments outperformed the comparison treatment in reducing the number of narrow-leaves weeds, except that, The highest decrease in the number of weeds was on the second date (7/12) and with the two concentrations (375 and 750 ml.ha^{-1}), which amounted to (15.33 and 14.33 plants. m^{-2}) respectively, noting that they did not differ significantly with the third date (1/7) for the same concentrations. While the first date (7/11) for planting was recorded at half concentration (187.5 ml / ha), the lowest decrease in the number of narrow-leaves weeds in the field, which amounted to (48.67 plants.m^{-2}), which did not differ significantly with the comparison treatment.

2- The table (1) indicates that there were no significant differences between the three planting dates in their effect on the dry weight of the narrow-leaves weeds. The difference in herbicide concentrations had a significant effect on the dry weight of the narrow-leaves weeds, All spraying treatments outperformed the comparison treatment, which recorded the highest dry weight of narrow-leaves weeds. However, the highest reduction in dry weight of narrow leaves was at the rate of spraying twice the concentration (750 ml / ha) compared with the comparison treatment, as the percentage of decrease was (391.27%) Then, the spray treatment with concentration (375 ml / ha) decreased the dry weight

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compared to the comparison treatment by (263.57%), then followed by the half concentration treatment (187.5 ml / ha) by (107.63%). This indicates the effect of the basegran herbicide used in reducing the number of weeds and reducing their size, which was reflected in the decrease in their dry weights and with all the rates of spraying, as the herbicide killed the living tissues involved in the process of photosynthesis and this leads to the superiority of the demolition process over the building process inside plant tissues Consequently, the dry matter accumulation decreased and this was reflected in the dry weight of the weeds, and this is consistent with what was mentioned by , Mekonnen et al. (16) and Kebede et al. (17) who found that the dry weight of the vegetative parts of the weed plants decreased with the increase of the concentration of pesticides. Interaction between planting dates and the concentration of the herbicide had a significant effect on the dry weight of the narrow-leaves weeds, as shown in table(3) the lowest dry weight of narrow-leaves weeds when planting on the second date (7/12) was 45.80 g / m² compared to the comparison treatment, in which the dry weight of the weeds was 266.19 g / m².

3- Table data indicate(1) the presence of significant differences between planting dates in their effect on the number of broad-leaved weeds, as the third date (1/7) outperformed the first and second dates (7/11 and 7/12), as it recorded the highest percentage decrease in the number of broad-leaved weeds. Which amounted to (74 and 92.44%) for appointees respectively, this may be due to the coincidence of weed seed germination with the decrease in temperature, which led to a decrease in the number of growing weed plants compared to the first and second dates. The results of table (2) indicate the presence of significant differences between the concentrations of the herbicide spraying in its effect in reducing the number of broad-leaved weeds growing in the field of pests. All spraying rates of the herbicide outperformed the comparison treatment in reducing the number of broad-leaved weeds, but it exceeded the spraying rates by concentration (375 and 750 ml. ha^{-1}) on the half concentration treatment (187.5 ml. ha^{-1}), while the percentage decrease in the numbers of weeds for the three concentrations compared with the comparison treatment (145.27, 151.5 and 30.73%), respectively, the reason for this decrease may be due to the fact that the use of herbicides at an early age of the growth of the bush contributed to its killing more due to the increase in its vitality and the activity of its metabolic processes and the softness of its tissues and this leads to an increase in the penetration of the herbicide and its accumulation within the tissues of the plant as well as the high effectiveness of the herbicide that hinders the growth of the weed And then her death, and this corresponds to the findings of , Rahmatizadeh et al. (18) and Zand and Baghestani. (19). Interaction between planting dates and the concentration of the herbicide had a significant effect on the number of broad-leaved weeds table(3), as they all outperformed the comparison treatment, as the highest reduction rate was in the number of broad-leaf weeds when planting on the third date 7/1, and the spray rate was twice the concentration of 750 ml. ha^{-1}, which recorded (2.67 plant. m^{-2}), while the comparison treatment recorded on the first date 7/11 the highest number of weeds per square meter, which amounted to (13 plants.m^{-2}).

4- It is evident from Table (1) that there is a significant effect of planting dates in reducing the dry weight of broad-leaved weed, the largest significant decrease was obtained when planting on the third date 1/7 compared to the first date, which reached (10.19%), knowing that it did not differ significantly, with the second date 7/12, and this may be attributed to the short life span of the weed at the third date of planting until the time of harvest, which caused a decrease in the accumulation of dry matter in the weed plants, as agriculture is affected by environmental conditions, which are considered one of the most important factors that affect the physiological processes that take place Inside the plant, as high temperatures and a long period of lighting affect the acceleration of physiological processes inside the plant, While the short period of its growth means that the photosynthetic products become insufficient to meet the requirements of the plant to complete

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the growth stages, which negatively affects the accumulation of dry matter in the plant and this is completely identical to what was indicated by both, Khazaei (20). Table (2) shows a significant effect on all the concentrations used of the pesticide of the basegran herbicide in reducing the dry weight of broad-leaves weed compared with the comparison treatment, but the largest reduction was when using the double concentration (750 ml.ha^{-1}) when compared with the comparison treatment, as it reached (659.97% Then the concentration was 375 ml.ha^{-1} and the decrease was (327.15%), then the half concentration was 187.5 ml. ha^{-1}, where the percentage of decrease was (102.97%). The reason for this is due to the specialization of the basegran herbicide in controlling broad-leaved weeds, limiting their growth and reducing their dry weights, and this is in line with findings, Hussan et al. (21) and Hussein (22) that the reason for reducing the numbers of broad-leaved weeds is due to the effectiveness of the herbicides and their positive effects in reducing the density of weeds. Table (3) indicates the presence of significant interaction between planting dates and pesticide concentrations, as the lowest dry weight value for broad-leaved weeds was when planting on the first date (7/11) and the use of twice the concentration (750 ml. ha^{-1}), which amounted to (7.10 g.m^{-2}). Whereas, the highest dry weight of broad-leaved weeds was when planting on the third date and when adding half the concentration (187.5 ml. ha^{-1}), which was (36.60 g.m^{-2}).

Characteristics Yield:

5- Table (1) indicates that there were significant differences between planting dates of *Vicia faba* L. plants in their effect on plant height, As the first date 7/11 outperformed the second date 7/12 morally by (1.54%), While the second date outperformed the third one 7/1 by (15.197%). The reason for this may be due to the long period of time between planting and ripening that allowed plants to grow better at early dates compared to late dates, and this is consistent with what they found , AL-Saidan (23) and Chauhan et al. (24), as they confirmed that the height of the plants decreased gradually due to the delay in the planting date, and they interpreted this because the late planting exposes the plants to the negative effect of high temperatures during the elongation stages, which leads to the acceleration of plants in stopping the vegetative growth and the trend towards flowering, and this leads to a reduction in the elongation period, thus reducing the plant height. The table (2) also indicates that there are significant differences between the herbicide concentrations of basegran in the height of the *Vicia faba* L. plants, as the concentrations of the three herbicides decreased the height of the plants compared to the comparison treatment , It was also found that the lowest height of the *Vicia faba* L. plants was at concentration (750 ml.ha^{-1}), which decreased the height of the plants by (105.25%). It is noted from the table that the higher the concentration of the herbicide the lower the plant height, and the reason for this may be due to the negative effects of the herbicide on the vital processes of the plant, which was reflected in its height, although the herbicide is specialized to control the weed of pests, but there must be negative effects, even slight, on the crop plants. Interaction between the dates of planting *Vicia faba* L. and the concentration of the basegran herbicide has a significant effect on the height of the *Vicia faba* L. plants table (3), as the table indicates a decrease in the height of the *Vicia faba* L. plants for the treatments planted on the third date, which were sprayed with weak concentration (750 ml. ha^{-1}) by (41.933 cm). It is also noticed from interaction that the best plant height was in the comparison treatment, especially those planted in the first and second dates. We conclude from this that the greater the time period for growth, the more it gave an opportunity for the *Vicia faba* L. plants to grow and reach their natural limit, while the short period of time works on a decrease in the length of the plant. We also conclude that the herbicide basegran, although it is specialized to combat the weed of pests, has negative effects on the biological processes that are reflected in the height of the plant.

6- The results of Table (1) showed that there were significant differences between planting dates in their effect on the quality of the number of pods / plant, as the decrease was gradual and significant whenever the date of

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planting was delayed, as the first planting date exceeded 11/7 significantly over the second and third dates (7/12 and 7 / 1). As the first date gave the highest percentage increase in the number of pods/plant, which amounted to (24,601%), Then the second date 7/12 outperformed the third 7/1. The percentage increase in the number of pods for the second date compared to the third was (68.73%). The reason for the first date 7/11 exceeding the second and third dates (7/12 and 7/1) in the number of pods / plant may be attributed to the availability of optimum environmental conditions for plants, such as temperature and humidity, as well as a decrease in the percentage of flowering at this date, especially that the temperatures The high in the late dates coinciding with the blooming of flowers leads to the killing of pollen grains and damage to much of them, and thus a decrease in the pollination process and fertilization, which causes a decrease in the number of pods per plant and this is consistent with what was stated by, Murir et al. (25) who indicated that early cultivation leads to an increase in the number of pods. plant^{-1} due to appropriate environmental conditions. The results of Table (2) also indicated that there were significant differences between the concentrations of the herbicide of basegran in their effect on the characteristic of the number of pods . plant^{-1}, as the spray treatment with a concentration of (375 ml. ha^{-1}) outperformed the spray treatment by twice and half the concentration (187.5 and 750 ml.ha^{-1}) and the comparison treatment, an increase in the number of pods. plant^{-1} amounted to (46.86, 102.5 and 105.77%) respectively, The reason for this may be attributed to the high effectiveness of the pesticide in reducing and scaling the role of the weed, and this in turn leads to the lack of competition for the crop, which gives it the opportunity to optimize the use of growth elements, which increases the efficiency of photosynthesis and pushes the leguminous plant to produce the largest number of pods per plant and this is consistent with what Find it , Ciba- Gigy (26). The interaction between planting dates and pesticide concentrations had a significant effect on the number of pods per plant, as the treatment of the first planting date (11/7) and the rate of spraying with the concentration (375 ml. ha^{-1}) outperformed the rest of the treatments as it gave the highest significant value to the number of pods / plant (11.46 pod. plant^{-1}), While the lowest significant values for this trait were recorded At the third planting date (1/7), with a spray rate of half and twice the concentration (187.5 and 750 ml. ha^{-1}) and the comparison treatment, which amounted to (3.66, 2.53 and 3.20 pods.plant^{-1}) respectively, the reason for the decrease may be attributed to the excessive concentration that led to the weakening of the selective characteristic of the herbicide, which led to the negative impact on the *Vicia faba* L. plants, and also the delay of the planting date, which may lead to coincidence of the flowering period with high temperatures, which leads to flower damage, pollen death and no formation of pods.

7- The results obtained in Table (1) indicate that there is a significant effect of planting dates of *Vicia faba* L. in their effect on the number of seeds per pod, As the first date (7/11) and the second (7/12) outperformed the third date (1/7) in giving the highest percentage increase in the number of seeds in the per pod, which amounted to (58.51 and 32.05%), respectively. The reason for this increase may be due to the growth of the plant at the appropriate time through the availability of appropriate climatic conditions for its growth and the length of the vegetative growth period, which leads to the strength of germination and to give strong and more efficient seedlings in the exploitation of the elements of growth and this gives the plant the ability to resist the decrease in temperatures during the winter as well as protection from high temperatures that hinder the pollination and fertilization process, as the flowers bloom and pollinate when the temperatures are ideal for this, and this results in an increase in the number and length of the pods. As for the concentrations of pesticide spraying, the results of table (2) showed that there are significant differences between the concentrations of spraying the herbicide and the comparison treatment, the rate of spraying with a concentration (375 ml. ha^{-1}) surpassed the other spraying rates by half and twice the concentration (187.5 and 750 ml. ha^{-1}) and the comparison treatment, as the percentage increase in the number of seeds per pod was

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(73.47, 122.81 and 93.75%), respectively. The reason for this may be due to the fact that the use of herbicides in controlling the weeds associated with the crop of *Vicia faba* L. and reducing its density contributed to increasing the length of the pod in the plant and thus increasing the number of seeds / pod, and this is consistent with what he mentioned , Behdaruandi and Modhaj (27) as he indicated that the appropriate concentrations of herbicides It gives positive results for the yield components without affecting the plants of the crop itself. The results in Table (3) show that there is significant interaction between planting dates and spraying the herbicide the treatment planted on the first date (7/11) and the rate of spraying with concentration (357 ml. ha^{-1}) achieved the highest number of seeds / pod compared with the rest of the treatments and the comparison treatment, which amounted to (8.26 seeds .pod^{-1}).

8- It is evident from Table (1) that there is a significant effect of planting dates on the weight of 100 seeds, as it is noticed that this characteristic decreases whenever the date of planting is delayed, the first planting date exceeds (7/11) in giving the largest significant value for this characteristic and the percentage of increase in weight compared to the two dates The second (7/12) and the third (7/1) are (4.35 and 25.4%), respectively, the reason for this may be due to the prolonged growth period of the cultivated plants at the early dates, which reflected positively on the strength of plant growth, which increased the values of all growth characteristics and the yield of the pollutants, which resulted in an increase in the formation of dry matter and its storage in the seeds. The late dates are due to the inadequate environmental conditions for each stage of plant growth, where the high temperatures lead to a negative effect on the plants, as the speed of the physiological processes inside the plant increases and the formation and transmission of photosynthesis products in the vegetative parts of the plant stops, and this reduces the supply and accumulation of dry matter in the estuaries (seeds) due to the shortening of the filling periods of the seeds, which leads to their atrophy due to the rapid loss of moisture and the reduction of their storage capacity and thus a decrease in their weight. Table (2) also shows the presence of a significant effect of the concentrations of the herbicide on the weight of 100 seeds, as the highest significant value for this characteristic was obtained when using the concentration of 375 ml. ha^{-1} compared to the comparison treatment and twice and half the concentration (187.5 and 750 ml. ha^{-1}). Where the increase was estimated as a percentage (40.01, 20.53 and 38.76%) respectively. It is likely that the reason for this is due to the effective effect of the herbicide at a concentration of 375 ml. ha^{-1} in eliminating the weeds by reducing their numbers and dry weights, and this in turn led to a reduction in their competition for the crop of *Vicia faba* L., which increased the photosynthesis products and transported them to the estuaries, and this had a positive effect. The increase in the number of weeds and pods and the increase in the number of seeds per pod per plant, which in turn led to an increase in the weight of the seeds due to the increased accumulation of dry matter, and when the concentration increased beyond the recommended limits, the herbicides lost the optional character and this leads to damage to the crop plants and reduce their productivity. The results in Table (3) show that there is significant interaction between the planting dates and the concentrations of the herbicide of basegran in the weight of 100 seeds of *Vicia faba* L. plants, as the herbicide concentration exceeded (375 ml. ha^{-1}) and in the two dates (11/7 and 7/12) in recording the highest value for the weight of 100 seeds, which reached at the first date of the two sites (159.57 and 166.97 grams) and the second (156.10 and 160.94 grams) respectively, while the comparison treatment was recorded on the third date 7/1 the lowest value, which amounted to (80.27 grams).

9- The results in Table (1) indicate that there are significant differences between planting dates in their effect on the bean yield, as the first date (7/11) achieved a significant increase in the yield of seeds over the second and third dates (12/7 and 1/7) with a percentage increase. It reached (9.77 and 190.9%), respectively, and the second date also recorded a significant increase over the third date (1/7), which amounted to (165.01%).The reason may

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be due to better environmental conditions at the first date for the crop plants, such as temperature, lighting and humidity during the growth and flowering stages, and the accumulation and deposition of dry matter, which provided plants with a better opportunity to increase the values of the growth characteristics and the components of the seeds of remnants compared to the rest of the dates, this is consistent with his findings(Al-saidan, 2019(23) and Bhateshwar et al. (28)), where they stated that the characteristics of the seed yield and its components decrease when the planting date is delayed due to the inadequate climatic conditions for the growth stages. The table (2) indicates the presence of a significant effect of the pesticide concentrations on the seed yield of the bean crop, as the spraying time exceeded the concentration (375 ml. ha^{-1}).

On the comparison treatment, half and twice the concentration (187.5 and 750 ml.ha^{-1}), the percentage increase in seed yield was (85.21, 167.11 and 65.94%), respectively. The reason for this may be that the control of the weed using herbicides led to a reduction in the density of the weed, which in turn led to a decrease in the competition between the crop and the weed on the requirements for growth, which was reflected positively on the increase in the yield of seeds and its components, the lowest significant value of the seed yield was observed when treating with weak concentration (750 ml. ha^{-1}), which was (183.60 $g.m^{-2}$), respectively, due to the negative effect of increasing the chemical concentration of the herbicide, which led to a decrease in the amount of seed yield due to weak crop plants in general. It is evident from the data obtained from Table (3) that there is a significant interaction between planting dates and herbicide concentrations in their effect on the remainder yield, as the highest seed yield was obtained significantly when planting with the first dates (7/11) and the second (7/12) with Spraying with concentration (375 ml. ha^{-1}), which reached (624.71 and 601.58g. m^{-2}), respectively, while the lowest seed yield for the bean crop was when planting on the third date (1/7) and using twice and half the concentration (187.5 and 750 ml. ha^{-1}) and the comparison treatment, where the values were (93.59, 114.76 and 111.51 g. m^{-2}), respectively.

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Table (1)The effect of planting dates on the growth and yield characteristics of *Vicia faba* L. and associated weeds.

Sowing date	No. of narrow leaves weeds	Dry weight of narrow leaves weeds	No. of broad leaves weeds	Dry weight of broad leaves weeds	Height plant	No. of pods	No. of seeds / pods	Weight of 100 seeds	Seeds yield
1	29.67 b	131.55 a	4.50 b	29.51 a	85.82 a	7.80 a	5.33 a	130.43 a	410.58 a
2	30.25 b	121.26 a	8.67 a	28.19 ab	84.52 b	6.27 b	4.93 a	124.98 b	374.04 b
3	38.75 a	133.04 a	7.83 a	26.78 b	73.37 c	3.73 c	3.35 b	104.01 c	141.14 c

Values followed by similar letters do not differ significantly from each other at 5%.

Table (2) The effect of basegran herbicide on the growth and yield of *Vicia faba* L. and the associated weeds.

Herbicide doses	No.of narrow leaves weeds	Dry weight of narrow leaves weeds	N0. of broad leaves weeds	Dry weight of broad leaves weeds	Height plant	No. of pods	No. of seeds / pods	Weight of 100 seeds	Seeds yield
Control	48. 56 a	262.44 a	10.89 a	60.57 a	99.84 a	4.33 c	3.69 b	104.85 c	264.79 c
187.5 ml.ha^{-1}	41.67 b	126.40 b	8.33 b	29.93 b	96.067 b	6.067 b	4.11 b	105.79 c	295.53 b
375 ml.ha^{-1}	23.44 c	72.184 c	4.44 c	14.176 c	80.38 c	8.91 a	7.13 a	146.80 a	490.42 a
750 ml.ha^{-1}	17. 89 d	53.42 d	4.33 c	7.97 d	48.64 d	4.40 c	3.20 c	121.80 b	183.60 d

Values followed by similar letters do not differ significantly from each other at 5%.

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Table (3) The effect of planting dates and basegran herbicide on the growth and yield characteristics of *Vicia faba* L. and the associated weeds.

Sowing date	Herbicide doses	No. of narrow leaves weeds	Dry weight of narrow leaves weeds	No. of broad leaves weeds	Height plant	Dry weight of broad leaves weeds	No. of pods	No. of seeds / pods	Weight of 100 seeds	Seeds yield
1	Control	49 a	266.19 a	13 a	103.73 a	60.90 a	4.73 fgh	4.33 de	117.55 b	368.21 c
	187.5 ml.ha^{-1}	48.67 a	120.67 b	9.67 d	100.13 b	31.83 c	8.26 c	4.60 d	119.91 b	420.19 b
	375 ml.ha^{-1}	36.66 cd	84.30 c	4.33 cde	86.13 e	18.21 e	11.46 a	6.26 a	159.57 a	624.71 a
	750 ml.ha^{-1}	20.66 e	55.03 de	4.33 cde	53.27 g	7.10 g	6.73 d	4.06 de	124.70 b	229.23 e
2	Control	49.33 a	255.52 a	12.66 a	103.33 a	65.03 a	5.46 efg	3.93 de	116.74 b	314.66 d
	187.5 ml.ha^{-1}	42 bc	128.92 b	10.66 ab	99.4 b	26.96 d	6.26 de	4.73 d	105.96 c	351.65 cd
	375 ml.ha^{-1}	15.33 f	54.79 de	5.33 cde	84.6 e	12.56 f	9.80 b	7.40 b	156.10 a	601.85 a
	750 ml.ha^{-1}	14.33 f	45.80 e	6 cd	50.73 h	8.22 fg	3.93 ghi	3.66 ef	121.19 b	227.99 e
3	Control	47.33 ab	256.62 a	7 c	92.47 c	55.79 b	3.20 ij	2.80 g	80.27 e	111.51 f
	187.5 ml.ha^{-1}	34.33 d	129.62 b	4.67 cde	88.67 d	30.99 cd	3.66 hij	3 fg	91.52 d	114.76 f
	375 ml.ha^{-1}	18.33 ef	77.46 cd	3.66 de	70.4 f	11.75 fg	5.46 def	5.73 c	124.74 b	244.71 e
	750 ml.ha^{-1}	18.66 ef	49.55 de	2.67 e	41.93 i	8.59 fg	2.53 j	1.86 h	119.51 b	93.59 f

Values followed by similar letters do not differ significantly from each other at 5%.

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