

Contents

	Page
1. Introduction	1
2. Review of literature	4
3. Materials and Methods.....	49
4. Results and Discussion.....	60
Vegetative Growth	60
1- Effect of gamma radiation and foliar application of ATP on	60
A- Fresh weight of plant shoot.....	60
D – Dry weight of plant shoot	62
2- Effect of gamma radiation and foliar application of kinetin on	66
A- Fresh weight of plant shoot.....	66
D – Dry weight of plant shoot.....	67
3- Effect of gamma radiation and foliar application of tryptophan on.....	69
A- Fresh weight of plant shoot	69
D – Dry weight of plant shoot.....	70
Volatile oil production.....	73
A- volatile oil percentage.....	73
1- Effect of gamma radiation and foliar application of ATP	73
2- Effect of gamma radiation and foliar application of kinetin	75

3- Effect of gamma radiation and foliar application of tryptophan	76
B- Volatile oil content.....	77
1- Effect of gamma radiation and foliar application of ATP	77
2- Effect of gamma radiation and foliar application of kinetin	79
3- Effect of gamma radiation and foliar application of tryptophan	81
C- volatile oil yield (Kg/fed).....	82
1- Effect of gamma radiation and foliar application of ATP	82
2- Effect of gamma radiation and foliar application of kinetin	84
3- Effect of gamma radiation and foliar application of tryptophan	86
GLC of fennel and caraway volatile oils.....	87
1- fennel oil.....	87
2- caraway oil.....	92
Fruit yield (g/plant).....	98
1- Effect of gamma radiation and foliar application of ATP	98
2- Effect of gamma radiation and foliar application of kinetin	100
3- Effect of gamma radiation and foliar application of tryptophan	102

Fruit yield (Kg/fed).....	103
1- Effect of gamma radiation and foliar application of ATP	103
2- Effect of gamma radiation and foliar application of kinetin	105
3- Effect of gamma radiation and foliar application of tryptophan	107
Chemical composition.....	108
Chlorophyll content.....	108
A- Chlorophyll (a)	109
1- Effect of gamma radiation and foliar application of ATP	109
2- Effect of gamma radiation and foliar application of kinetin	111
3- Effect of gamma radiation and foliar application of tryptophan	112
B-Chlorophyll (b).....	113
1- Effect of gamma radiation and foliar application of ATP.....	113
2- Effect of gamma radiation and foliar application of kinetin	115
3- Effect of gamma radiation and foliar application of tryptophan	116
C- Total chlorophyll content.....	118
1- Effect of gamma radiation and foliar application of ATP.	118

2- Effect of gamma radiation and foliar application of kinetin	120
3- Effect of gamma radiation and foliar application of tryptophan	122
Nutrient content.....	124
A- Nitrogen %.....	124
1- Effect of gamma radiation and foliar application of ATP	124
2- Effect of gamma radiation and foliar application of kinetin	126
3- Effect of gamma radiation and foliar application of tryptophan	127
D- Total protein content.....	129
1- Effect of gamma radiation and foliar application of ATP	129
2- Effect of gamma radiation and foliar application of kinetin	132
3- Effect of gamma radiation and foliar application of tryptophan	133
B- Phosphorus content.....	134
1- Effect of gamma radiation and foliar application of ATP	134
2- Effect of gamma radiation and foliar application of kinetin	137
3- Effect of gamma radiation and foliar application of tryptophan	138

C- Potassium content.....	140
1- Effect of gamma radiation and foliar application of ATP	140
2- Effect of gamma radiation and foliar application of kinetin	142
3- Effect of gamma radiation and foliar application of tryptophan	144
Non-reducing sugars.....	145
1- Effect of gamma radiation and foliar application of ATP	145
2- Effect of gamma radiation and foliar application of kinetin	148
3- Effect of gamma radiation and foliar application of tryptophan	149
Reducing sugars content	150
1- Effect of gamma radiation and foliar application of ATP	150
2- Effect of gamma radiation and foliar application of kinetin	152
3- Effect of gamma radiation and foliar application of tryptophan	153
Total sugars content.....	155
1- Effect of gamma radiation and foliar application of ATP	155
2- Effect of gamma radiation and foliar application of kinetin	157

3- Effect of gamma radiation and foliar application of tryptophan	158
Total carbohydrates content.....	160
1- Effect of gamma radiation and foliar application of ATP	160
2- Effect of gamma radiation and foliar application of kinetin	162
3- Effect of gamma radiation and foliar application of tryptophan	164
Effect of fennel and caraway plants volatile oils obtained from gamma radiation and / or foliar application of ATP, kinetin and tryptophan on sunflower oil oxidative rancidity	166
5. Summary.....	171
6. References.....	182
- Arabic Summary.....	-