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OSU Current Report

Cooperative Extension Service • Division of Agricultural Sciences and Natural Resources
Oklahoma State University

1992 Government Wheat Program Worksheet

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This worksheet is to be used to evaluate participation choices in the 1992 government wheat program. The alternatives include non-participation in the 1992 government wheat program, participation in the regular program, and participation at a specified level in the 0/92 option of the regular program.

Values used to calculate net returns are written on specified lines. **Each line is given a name and a number.** For example, in the required data section, the first required number is the Target Price. $4 was placed on the specified line and given the name **TP** and the number 1.

On the second page under PROGRAM PARTICIPATION, the equation for Expected Regular Deficiency Payment/Bushel is TP(1) - LARGEST OF(RL(2) OR (5P(10)). TP(1) means to use the value on the line designated TP(1). The (1) implies that TP is the first value.

The second value in this equation is RL(2). The value RL is the second value listed. 5P(10) is the expected five-month average price of wheat, and is the tenth value listed.

Each value listed in the REQUIRED DATA section or calculated using the REQUIRED DATA is given both a name and a number. The answer for the Expected Regular Deficiency Payment/Bushel is given the name RDP and the number 21.

Calculations within parentheses must be completed before calculations outside parentheses. For example, Non-Harvested Acre Costs = (BA(6) - HA(24)) x CHN(13). The value for BA is 100, HA is 80, and CHN is $40. Since BA and HA are enclosed within parentheses, 80 is subtracted from 100 and the answer, 20, is multiplied by $40.

Required Information

Government program provisions that have been announced are listed as part of the worksheet. These provisions (numbers) may change. Thus, it is important that the provision values be verified at the County ASCS office.

The target price is $4 per bushel. The regular loan is $2.58. The emergency loan is $2.21, and the guaranteed deficiency payment is $1 per bushel. The remaining information must be provided by the user.

To explain the worksheet, a set of acres, prices, and yields were assumed. These values are listed as REQUIRED DATA. Note that each value has a short name and number. Both the name and number may be used to determine which value should be used to determine costs and returns.

Target Price TP(1) is the price set by the USDA which is used to calculate the deficiency payments. The 1990 Farm Bill set the wheat target price at $4 for crop years 1990 through 1995.

Regular Loan RL(2) is set each year based on the past years' average price and the expected average annual price for the crop year being calculated. The difference between the Regular Loan and the Target Price is the maximum regular deficiency payment. This deficiency payment is limited to $50,000.

Emergency Loan EL(3) is set each year based on the past year's average price and the expected average annual price for the crop year being calculated. The difference between the Regular Loan and the Emergency Loan is the maximum emergency deficiency payment. The emergency deficiency payment does not count toward the $50,000 payment limit.

Guaranteed Deficiency GD(4) is the deficiency payment that is guaranteed for non-harvested acres for pay in the 0/92 program. The participant receives the higher figure of either the calculated deficiency payment or the guaranteed deficiency payment. Only non-harvested acres for pay are eligible for the guaranteed deficiency payment.

Acres Planted To Wheat (Acres) PA(5) are the number of crop acres on the farm that were or may be planted to wheat. This example uses 100 acres.

Base Acres (Acres) BA(6) are the number of wheat base acres on record at the County ASCS office. This example uses 100 acres which is the same as Acres Planted to Wheat.

Base Yield (Bushels) BY(7) is the established yield for the field or farm that has been established and is on record at the County ASCS office. The example assumes a base or program yield of 30 bushels per acre.

Expected Yield (Bushels) EY(8) is the expected production in bushels per acre for the field or farm. This yield may be a historical average or the best guess of how many bushels per acre will be harvested. More than likely, this number will not be the same as the ASCS base or program yield. The example assumes an expected yield of 30 bushels which is the same as the ASCS program yield.

Expected Price Received EP(9) is the expected price per bushel that will be received for the wheat. If the wheat is going to be stored, storage and interest costs should be subtracted from the expected price. The net price (expected price minus storage and interest) should be used rather than the actual price received. This example assumes a net price of $3 per bushel.

5-Month Average Price 5P(10) is the expected five-month average price for the period June 1992 through October 1992. In this example, we assume this price to be $3.10. It is expected to be 10 cents per bushel higher than the net price of $3. This price is used to calculate deficiency payments.

12-Month Average Price 12P(11) is the expected 12-month average price for the period June 1992 through May 1992. In this example, we assume this price to be $3.20. It is expected to be 20 cents higher than the net price received for the wheat and 10 cents higher than the five-month average price. This price is used to calculate the emergency deficiency payment.

Cost Per Harvested Acre CH(12) is the cost to produce wheat. This cost may include only variable costs (seed, fertilizer, chemical, machinery, rent, etc.), or it may include total costs (variable costs plus land ownership costs, machinery depreciation, etc.).

Cost Per Non-Harvested Acre CNH(13) is the costs that are applied to wheat base acres that are not harvested. These costs may include only variable costs (seed, fertilizer, chemical, machinery, rent, etc.) or may include total costs (variable costs plus land ownership costs, machinery depreciation, etc.). If only variable costs are used for cost per harvested acre, then only variable costs should be used for cost per non-harvested acre. If variable plus fixed costs are used in cost per harvested acre, then variable plus fixed costs should be used here also.

Percentage Set-Aside %SA(14) is declared by the USDA and, for the 1992 wheat program, is set at 5%.

Percent Flex Acres %FA(15) have been set by USDA at 15%; thus, the minimum number inserted is 15. Producers may opt for up to 25% of the base to be designated as Flex Acres. Deficiency is not paid on flex acres.

Flex Acres-Harvested FAH(16) are the declared normal flex acres that will be harvested. This value will be from zero to 15% of the wheat base. The example assumes that none of the flex acres will be harvested.

0/92 - Acres Harvested 92HA(17) are the number of base acres that will be harvested. The maximum number of acres that may be harvested is 92% of the base acres minus set-aside minus a minimum of 15% normal flex acres minus an additional zero to 10% optional flex acres. This example assumes that the base acres are 100, the set-aside is 5%, normal flex acres are 15%, and the optional flex acres are zero. Thus the maximum number of acres that may be harvested is (100 - 5 - 15 = 80 acres; 80 x .92 = 73.6) 73.6 acres. It is assumed that only 65 acres will be harvested.

Calculating Expected Returns

The values from the required data section are used to calculate expected returns from not participating in the wheat program, participating in the regular program, and using the regular program plus the 0/92 option. The choice whether or not to harvest the normal flex acres may be evaluated by setting FAH(16) at 15% of the base acreage and then recalculating at 0% of the base.

Non-Participation

Crop Returns = PA(5) x EY(8) x EP(9) are the planted acres multiplied by the expected yield and the expected price. In the example, the planted acres are 100, the expected yield is 30 bushels per acre, and the expected price is $3 per bushel. The crop return is $9,000. This value is named CR(18) for crop return, and it is value number 18.

Crop Cost = PA(5) x CH(12) is the cost per harvested acres multiplied by the planted acres. The cost is 100 acres times $70 per harvested acre or $7,000. The value for crop cost is named CC(19).

Net Returns Non-Participation is the crop return minus crop cost or $9,000 minus $7,000. The net return is $2,000.

Program Participation

Both harvesting and not harvesting the normal flex and optional flex acres may be evaluated with the program participation form. The key is in designating values %FA(15) and FAH(16). A 15 in %FA(15) implies that 15% of the wheat base is designated flex acres. A number between 15 and 25 implies that the percentage (greater than 15 but equal to or less then 25) is designated as flex acres.

The value FAH(16) designates how many flex acres will be harvested as wheat. A zero means that no wheat will be harvested on the flex acres. A 15 means that wheat will be harvested on all the normal flex acres.

Expected Regular Deficiency Payment/Bushel (RDP(21)) cannot be less than zero. This value is calculated by subtracting the largest of the five-month average price of wheat (5P(10)) or the Regular Loan rate (RL(2)). Since the five-month average price is assumed to be $3.10 and the Regular Loan rate is $2.58, $3.10 is subtracted from the $4 target price. The Regular Deficiency payment is $0.90 and is named RDP(21). If the expected price was greater than $4 and the calculated deficiency payment was less than zero, zero would be entered for RDP(21).

Regular Program Participation

Expected Emergency Deficiency Payment/Bushel is the Regular Loan rate (RL(2)) minus the larger of the 12-month Average Price (12P(11)) or Emergency Loan rate (EL(3)). In this example, the 12-month Average Price (12P(11)) is $3.20, and the regular loan (RL(2)) equals $2.58. Thus, the equation would be $2.58 minus $3.20. Since the answer is a minus $0.62, the emergency deficiency payment would be $0. This value is named EDP(22).

If RDP(21) equals zero, then EDP(22) will equal zero.

% Deficiency Payment Acres is the percentage of wheat base acres that qualify for deficiency payments. This value will be a decimal. The percentage-set-aside (0.05) and the percentage flex acres (0.15 in this example) are subtracted from 100% (1.0). Deficiency payments will be received on 80% (0.80) of the wheat base acres (1 - .05 - .15).

Harvested Acres are the wheat Base Acres (BA(6)) multiplied by the % Deficiency Payment Acres (%DPA(23)) plus the Flex Acres Harvested (FAH(16)). Since 0 flex acres are harvested, 80 acres are harvested (100 x 0.80). This value is named HA(24).

Regular Deficiency is the Base Yield (BY(7)) times the Regular Deficiency Payment (RDP(21)) times the Base Acres (BA(6)) times the % Deficiency Payment Acres (%DPA(23)) (30 bushels x $0.90 per bushel x 100 acres x 0.80 = **$2,160**). This value is named RD(25).

Emergency Deficiency is the Base Yield (BY(7)) times the Emergency Deficiency Payment (EDP(22)) times the Base Acres (BA(6)) times the % Deficiency Payment Acres (%DPA(23)) (30 bushels x $0 per bushel x 100 acres x 0.80 = **$0**). This value is name ED(26).

Crop Return is the Harvested Acres (HA(24)) times the Expected Yield (EY(8)) times the Expected Price (EP(9)) (80 acres x 30 bushels x $3 = **$7,200**). This value is named CR(27).

TOTAL RETURN is crop returns and deficiency payments added together. In this example, the total return is **$9,360** ($2,160 + $7,200). This value is named TRP(28).

Harvested Acre Cost is the number of Acres Harvested (HA(24)) multiplied by the Cost per Harvested Acre (CH(12)). In this example, the harvested acre cost is **$5,600** (80 acres x $70). This value is named HAC(29).

Non-Harvested Acre Cost is the number of base acres not harvested multiplied by the Cost per Non-harvested Acre (CNH(13)). The acres not harvested are the base acres minus the acres harvested (HA(24)). In this example, the cost for non-harvested acres is **$800** (100 acres - 80 acres = 20 acres; 20 acres x $40 = $800). This value is named NHAC(30).

TOTAL COST is Harvested Acres cost (HA(24)) plus Non-harvested Acres Cost (NHAC(30)). In this example, the total cost is **$6,400** ($5,600 + $800). This value is named TPC(31).

NET RETURN PARTICIPATION is the Total Returns (TRP(28)) minus Total Cost (TPC(31)). In the example, the net return from participation with 0 harvested flex acres is **$2,960**.

0/92 Option of the Regular Program

Note that all 0/92 values have a 92 in front of the name. The calculations are much the same as with regular program participation calculations. Because there is a guaranteed minimum deficiency payment, the deficiency payments are a little more difficult. Other than the deficiency, calculating the net return is adding up the returns, adding up the costs, and then subtracting costs from returns.

Deficiency Payment — Harvested Acres are the acres harvested (92HA(17)) times the base yield (BY(6)) times the regular deficiency payment (RDP(21)) plus the emergency deficiency payment (EDP(22)). Note that the regular deficiency payment is added to the emergency deficiency payment before multiplying the sum by the program production (base yield x harvested acres). In this example, the deficiency payment for harvested acres is **$1,755** (65 acres x 30 bushels/acre = 1,950 bushels; $0.90 + $0 = $0.90; 1,950 bushels x $0.90 = $1,755). This value is named 92DPH(33).

Deficiency Payment — Non-Harvested Acres are calculated in two steps. The first step is to determine how many payment acres are not harvested. The second step is to determine the deficiency payment.

Equation #1 (0/92 Non-Harvested Acres) is determined by multiplying the base acres BA(6) by the percentage of acres that are eligible for deficiency payment in the regular program (%DPA(23)) and by 0.92. The 0/92 acres harvested are then subtracted from the product. The non-harvested acres for pay are 8.6 acres (100 x 0.80 x 0.92 = 73.6 acres; 73.6 - 65 = 8.6 acres). This value is named 92NHDA(34).

The second equation (Deficiency Payment) is the non-harvested acres for pay (NHDA(34)) multiplied by the program yield (BY(7)) and multiplied by the larger of the guaranteed deficiency (GD(4)) or the regular deficiency payment (RDP(22)). Since the guaranteed deficiency ($1) is larger than the regular deficiency payment ($0.90), the guaranteed deficiency is used. The non-harvested acres for pay deficiency payment are **$258** (8.6 acres x 30 bushels x $1).

CROP RETURN is the production from the harvested acres, Expected Yield (EY(8)) times the acres harvested (92HA(17)), multiplied by the Expected Price (EP(9)). The crop return was **$5,850** (65 acres x 30 bushels x $3). This value is named 92CR(36).

TOTAL RETURN is the deficiency payment — harvested acres (92DPH(33)) plus the deficiency payment — non-harvested acres (92DPNH(35)) plus the Crop Return (92CR(36)). Total return was **$7,863.** This value is named 92TR(37).

Harvested Acre Cost is production costs for harvesting wheat. These costs are the Harvested Acres (92HA(17)) multiplied by the cost per harvested acre (CH(12)). There were 65 harvest acres at a cost of $70 per acre. The costs to harvest 0/92 harvested acres were **$4,550**. This value is

named 92HAC(38).

Non-Harvested Acre Costs are the costs allocated to wheat for the base acres that are not harvested. The numbers of acres are the base acres (BA(6)) minus the acres harvested (92HA(17)). This number is multiplied by the costs per non-harvested acre (CNH(13)). In this example, the cost is $1,400 (100 acres - 65 acres = 35 acres; 35 acres x $40/acre = **$1,400**). This value is named 92NHC(39).

Total Cost is the cost for harvested acres (92HAC(38)) plus the cost for non-harvested acres (92NHC(39)). Total costs for the 0/92 option are **$5,990**. This value is named 92TC(40).

NET RETURN 0/92 is the total return (92TR(37)) minus the total cost (92TC(40)). Net return for the 0/92 option is **$1,913** ($7,863 - $5,950).

Summary

Net return per acre for each alternative may be calculated by dividing the net return by the base acres or, for a non-participation alternative, net return per acre may be calculated by dividing by the acres planted.

Different options may be evaluated by altering the input values. For example, harvesting normal flex acres may be evaluated by changing the input value FAH(16) to the number of flex acres to be harvested. The above example assumed that no flex acres were harvested.

Break-even returns may be calculated by determining the difference in net returns and dividing by the number of acres available to make up the difference in return.

For example, the net return for the regular program without harvesting normal flex acres (harvesting 80 percent of the base acres) was $2,960 (NPR(32)). The net return from harvesting 65 acres in the 0/92 option was $1,913 (92NR(41)).

For the 0/92 option to be selected, an additional $69.80 per acre must be generated on the additional 0/92 acres not harvested ($2,960 - $1,913 = $1,047; $1,047 / 15 acres = $69.80). The difference between the 0/92 option and the regular program is that an additional 15 acres are not harvested (80 acres - 65 acres). The loss in income going from the regular program to 0/92 is from not harvesting these 15 acres (wheat income + some loss in deficiency payment).

Not shown is the return for the regular program if the normal flex acres are harvested. Given the assumptions, the net return for the regular program if the normal flex acres are harvested is $3,860. The break-even for not harvesting the normal flex acres is $60 per acre ($3,860 - $2,960 = $900; $900 / 15 acres = $60 / acre).

The break-even for the 0/92 option (compared to the regular program and harvesting the normal flex acres) is $64.90 ($3,860 - $1,913 = $1,947: $1,947 / 30 acres = $64.90). Note that the income difference was divided by the difference in acres harvested (95) in the regular program and the acres harvested in the 0/92 option (65).

1992 GOVERNMENT WHEAT PROGRAM WORKSHEET

REQUIRED DATA

Target Price	$4.00	**TP(1)**
Regular Loan	$2.58	**RL(2)**
Emergency Loan	$2.21	**EL(3)**
Guaranteed Deficiency (0/92)	$1	**GD(4)**
Acres Planted to Wheat (Acres)	100	**PA(5)**
Base Acres (Acres)	100	**BA(6)**
Base Yield (Bushels)	30	**BY(7)**
Expected Yield (Bushels)	30	**EY(8)**
Epected Price Recieved	3.00	**EP(9)**
5-Month Average Price	3.10	**5P(10)**
12-Month Average Price	3.20	**12P(11)**
Cost per Harvested Acre	70	**CH(12)**
Cost per Non-Harvested Acre	40	**CNH(13)**
Percentage Set-Aside	5	**%SA(14)**
Percentage Flex Acres (15-25)	15	**%FA(15)**
Flex Acres Harvested (Acres)	0	**FAH(16)**
0/92 - Acres Harvested (Acres)	65	**92HA(17)**

NON-PARTICIPATION

Crop Return = PA(5) x EY(8) x EP(9)

= 100 x 30 x 3 = $9,000 CR(18)

Crop Cost = PA(5) x CH(12)

= 100 x 70 = 7,000 CC(19)

Net Return Non-Participation = CR(18) - CC(19)

= 9,000 - 7,000 = **2,000** **NRNP(20)**

PROGRAM PARTICPATION

IF RDP(21) OR EDP(22) IS LESS THAN ZERO, THE PAYMENT IS ZERO

Expected Regular Deficiency Payment/Bushel
= TP(1) - LARGEST OF(RL(2) OR 5P(10))

= $4 - 3.10 = .90 RDP(21)

Expected Emergency Deficiency Payment/Bushel
= RL(2) - LARGEST OF (EL(3) OR 12P(11))

= $2.58 - 3.20 = 0 EDP(22)

IF RDP(21) IS NEGATIVE(-), THEN RDP(21) IS ZERO(0)
IF EDP(22) IS NEGATIVE(-), THEN EDP(22) IS ZERO(0)

% Deficiency Payment Acres = 1 - %SA(14) - %FA(15)

= 1 - 0.05 - 0.15 = 0.80 %DPA(23)

Harvested Acres = (BA(6) x %DPA(23)) + FAH(17)

= (100 x 0.80) + 0 = 80 HA(24)

Regular Deficiency = BY(7) x RDP(21) x BA(6) x %DPA(23)

= 30 x 0.90 x 100 x 0.80 = 2,160 RD(25)

Emergency Deficency = BY(7) x EDP(22) x BA(6) x %DPA(23)

= 30 x 0 x 100 x 0.80 = 0 ED(26)

Crop Return = HA(24) x EY(8) x EP(9)

= 80 x 30 x 3 = 7,200 CR(27)

TOTAL RETURN = RD(25) + ED(26) + CR(27)

= 2,160 + 0 + 7,200 = **$9,360 TRP(28)**

Harvested Acre Cost = HA(24) x CH(12)

= 80 x 70 = 5,600 HAC(29)

Non-Harvested Acre Cost = (BA(6) - HA(24)) x CHN(13)

=(100 - 80) x 40 = 800 NHAC(30)

TOTAL COST = HAC(29) + NHAC(30)

= 5,600 + 800 = **6,400 TPC(31)**

NET RETURN PARTICIPATION = TRP(28) - TPC(31)

= 9,360 - 6,400 = **2,960 NPR(32)**

Deficiency Payment -- Harvested Acres

=92HA(16) x BY(7) x (RDP(21) + EDP(22))

= 65 x 30 x(.90 + 0) = 1,755 92DPH(33)

Deficiency Payment -- Non-Harvested Acres

#1 0/92 Non-Harvested Acres =(BA(6) x %DPA(23) x 0.92) - 92HA(16)

=(100 x 0.80 x0.92) - 65 = 8.6 92NHDA(34)

#2 Deficiency Payment = 92NHDA(34) x BY(7) x LARGER OF GD(4) or (RDP(21) + RDP(22))

= 8.6 x 30 x 1 = 258 92NDPH(35)

CROP RETURN = 92HA(16) x EY(8) x EP(9)

= 65 x 30 x 3 = 5,850 92CR(36)

TOTAL RETURN = 92DPH(33) + 92NDPH(35) + 92CR(36)

= 1,755 + 258 + 5,850 = **7,863 92TR(37)**

Harvested Acre Cost = 92HA(16) x CH(12)

= 65 x 70 = 4,550 92 HAC(38)

Non-Harvested Acre Cost = (PA(5) - 92HA(16)) x CNH(13)

=(100 - 65) x 40 = 1,400 92NHC(39)

TOTAL COST = 92HA(38) + 92NHC(39)

= 4,550 + 1,400 = **5,950 92TC(40)**

NET RETURN 0/92 = 92TR(37) - 92TC(40)

= 7,863 - 5,990 = **1,913 92NR(41)**

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