Pasture, Rangeland, Forage Vegetation Index Pilot Program
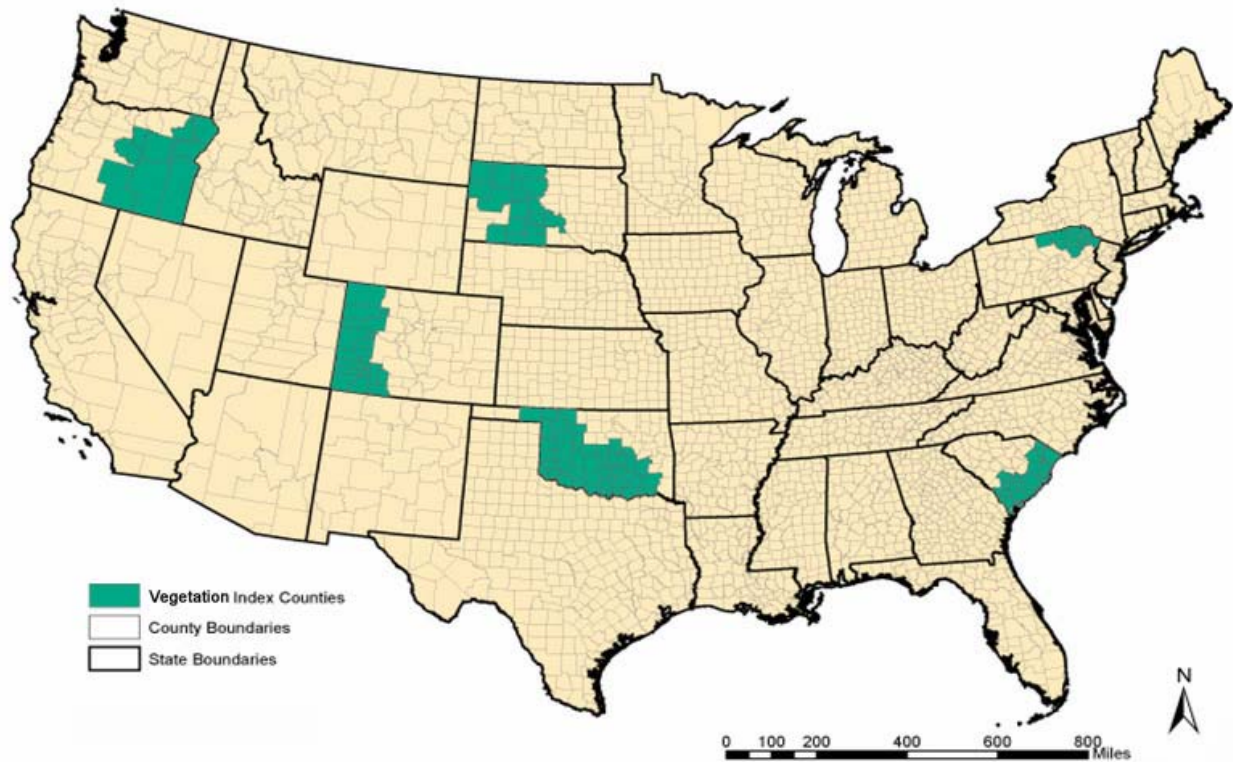
Trainer's Package

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*Introduction***:**

The Federal Crop Insurance Corporation (FCIC) approved the Pasture, Rangeland, Forage – Vegetation Index Pilot Program (PRF- VI) for six states beginning with the 2007 Crop Year (CY). The six states include counties in: Colorado, Oklahoma, Oregon, Pennsylvania, South Carolina, and South Dakota.

This training manual is intended to familiarize crop insurance agents with the conditions, provisions, and terms of the Pasture Rangeland, Forage Vegetation Index Crop Provisions, and related program materials. The training manual does not replace any procedures or modify any provisions contained in the complete insurance policy.

History

The Agricultural Risk Protection Act of 2000 (ARPA) mandates programs to cover pasture and rangeland (forage loss). This pilot program is one of the programs the Risk Management Agency (RMA) will implement to address this mandate. The purpose of this program is to provide a safety net for livestock producer's primary feed source – pasture and rangeland (forage). Pasture and rangeland acres account for the largest agricultural acreage in the United States – encompassing approximately 55% of the nation's total land area (~588 million acres).

When researching and developing potential programs for American forage producers, RMA faced many challenges in insuring this crop, which included:

- Various forage species
- Crop grown at different times of the year (i.e. warm/cool season varieties)
- Crop continually harvested via livestock
- Lack of individual/industry data to actuarially rate the program
- Vast differences in management practices across the industry
- Publicly announced prices not available

Overview

Given the constraints and uniqueness of the crop being covered, the PRF-VI Pilot Program will have the following characteristics, which provides for a proper delivery system of the desired producer's safety net.

- **Group Risk Plan (GRP) program**
    - Different types of existing programs were researched to determine the most applicable policy type for this new program.

    - The Contractor realized that if the foundation of an existing program could be utilized for this new and innovative program, it would potentially reduce the level of confusion accompanying any new program for all parties involved, thereby increasing the marketability and effectiveness.

    - The result was to design a new program based on the basic principals in the existing GRP program, thereby providing a sense of familiarity.

- **Index driven – based on gridded Normalized Difference Vegetation Index (NDVI) satellite data from USGS Earth Resource Observation System (EROS).**
    - A commonly used source of information for other government and private programs.

    - NDVI data is sustainable indefinitely given the strategic nature of the data to national monitoring programs and NASA. Continuity of the satellite based NDVI data delivery system is being developed by cross-platform redundancy between the AVHRR, MODIS and other satellite systems via a joint DOD and Dept. of Commerce collaboration with EPA, USDA and USAID.

    - NDVI is calculated from the visible and near-infrared light reflected by vegetation. Healthy vegetation absorbs most of the visible light that hits it, and reflects a large portion of the near infrared light.

    - NDVI data is available from an AVHRR (Advanced Very High Resolution Radiometer) dataset processed and distributed by EROS, which is utilized to establish the norm.

    - Provides consistent and universal coverage through the grid system and across the continental United States.

- **Index is based on deviation from normal of NDVI satellite greenness data during a given index interval**
    - Little to no actual production data available.
    - No scientifically consistent and sound methodology for measuring production for the crop without extensive field plots, man power, etc.
    - The deviation from long-term normal NDVI values during the index intervals is used to develop the index
    - Greenness of forage has a high degree of correlation to forage production. The correlation is well documented in the literature with r values that range from 0.5 to 0.95.

- **Areas of insurance are grids (grids ~ 4.8 x 4.8 miles) – therefore, there can be multiple grids per county**
    - Provides for a consistent program across the United States.
    - Counties vary in size, but the grids do not.
    - The NDVI grids are 8x8 km, or 4.8 x 4.8 miles. The size of the grids are small enough to capture local variations, but large enough so that it is unlikely that one individual can influence the index.
    - The grids allow for closer correlation to local forage greenness variations than using entire counties as an index.

- **Multiple Index Intervals are offered**
    - Coverage available over four index intervals, in 3-month increments, beginning with April 1 of the crop year.
    - Allows producers to appropriately design their coverage to match their local growth patterns and production seasons.
    - Minimizes dependency on subjective pre-determined estimated forage growing seasons for the program.
    - Maintains consistency across the country, while still allowing for regional and local variances by allowing individual freedom to select appropriate intervals.
    - Four index intervals better respond to the technology of NDVI satellite data and reporting.

- **Coverage levels available: 90, 85, 80, 75, and 70 – Catastrophic Risk Protection (CAT) currently not available**
    - Producers are still eligible for NAP coverage.
    - The higher coverage levels allowed mitigating some of the basis risk inherent in a group type program.

- **Each scenario of each grid, index interval, and coverage level combination are individually rated**
    - o Minimizes adverse selection – there is not an economic advantage of insuring in one scenario vs. another; therefore, encouraging the producer to select a scenario that best fit their operation.
    - o Adequate data permits the individual rating; thereby, allowing for the rates to accurately reflects the risks of each scenario.

- **No requirement to insure 100% of acreage**
    - o Forage utilized in the annual grazing or hay cycle can be insured without insuring all acreage.
    - o All acres within a property may not be productive, e.g., rocky areas, submerged areas.
    - o Provides additional flexibility for the insured to design the coverage to his specific needs.
    - o Because the program is a group program and other programs are not available, there is no opportunity to 'move' production.

- **Sales Closing Date and Acreage Reporting Date: November 30**
    - o Minimizes possible forecasting and system abuse, resulting in a minimum 120 day period before the start of the crop year.
    - o Provides consistency to other programs' Sales Closing Dates.

- **Program supported via internet**
    - o Provides the most efficient and effective way to deliver the program.
    - o Allows access to the mapping tools that allows the user to locate their grazing areas and associated Grid ID.
    - o Provides access to the historical NDVI indices.
    - o Allows access to all relevant data, materials, and tools associated with the program.

Advantages
- Flexibility – allows producers to tailor a program for their risk management needs by selecting: coverage levels, index intervals, productivity factor, and number of acres to insure
- Covers a lack of reflected greenness in plant cells based on satellite imagery (the index is related to the amount of vegetation on earth and the changes in greenness over time, a decrease in the index would indicate a decrease from normal)
- Provides for timely indemnities
- No individual loss adjustments needed
- Index is easy to understand

- No production records are required
- Moral hazard and adverse selection minimized

Disadvantages
- Individual losses/experiences not covered
- Only covers a decline in NDVI greenness index
- Flexibility – producer must determine when plant growth is important to their forage production
- Slight terminology differences from other GRP programs

Background of the Science Utilized

Biology of the Crop

Federally regulated crop insurance programs have been available to producers for many years. For the most part, these insurance products are based upon agronomic crops that are planted annually, such as cotton, soybeans, corn, grain sorghum, wheat and many others. Until recently, Federal crop insurance programs were not available for pasture, rangeland, or forage producers. The PRF-VI Pilot Programis an effort by USDA RMA to provide a forage-based insurance product for grazingland and hayland producers. There are significant differences between the PRF-VI Pilot Program and traditional crop insurance programs because of the crops each are designed to insure.

The PRF-VI Pilot Program deals with forage-based production systems on land areas that produce primarily perennial native vegetation (rangeland), including grasses, grass-like plants, forbs, shrubs and trees. Of this diversity of plant types, grasses, grass-like plants and forbs commonly dominate the vegetation available for foraging animals. Rangeland plant communities can be a mix of annual plants reproducing only by seed from one year to the next, or perennial, surviving from year to year from meristematic tissue that produces new growth in subsequent growing periods (basal buds, stolons, rhizomes, etc). Plants within rangeland communities may have different phenological characteristics, with both "warm season" species and "cool season" species. Thus, rangeland ecosystems are made up of diverse plant communities; diverse in the kinds of plants and phenological differences among plants and having vast differences in productivity across the industry. For example, on deep fertile soils in high rainfall areas, rangeland annual production of forage may easily reach 3-4 tons per acre of dry matter, whereas in the more arid regions rangeland annual yields may be less than 0.5 tons per acre. These differences in productivity equate to great variation in livestock carrying capacity and are recognized in the dollar value of rangeland

Different from native rangeland, pastures insured within the program are commonly thought of as perennial forage-based areas that may be native or non-native species and can be monocultures or mixes of species that produce forage. There are a wide variety of plant species used for pastures that are established by planting or "sprigging", or they may be developed from existing native vegetation enhanced in production and quality by cultural inputs. Forage from

pastures may be harvested directly by grazing animals or it may be harvested for hay or a combination of both. Once established, these pastures are not normally reestablished unless plant density declines. However, limited cultural practices, such as weed control, fertilization or subsoiling for improved moisture infiltration are commonly used. There are also significant differences in management practices applied to pastures across the industry. For example, pastures in arid and semi-arid regions that are dryland; that is, receiving only precipitation and normally little or no inputs of fertilizer and cultural practices, would be low producing, while others in the same area where the potential for irrigation exists may be irrigated and heavily fertilized to induce maximum production and forage quality. Similarly, producers in high rainfall areas may chose to increase production and forage quality by fertility programs, while others use little or no inputs. These differences in productivity potential are also reflected in the relative value of the forage and may be recognized by the producer in selection of the productivity factor for the land.

The key difference between crops in the PRF-VI Pilot Program and traditional crops is the dominance of perennial vegetation on rangeland and pastures and its capacity to live and reproduce from year to year from live meristem in the plants. The leaves of perennial grass plants are "food factories" that in the presence of sunlight combine carbon dioxide from the air with minerals and water from the soil to form plant food. This plant food provides energy for the plant to grow vigorously and compete with other vegetation, while providing nutritious forage for livestock and wildlife, as well as residue for soil organic matter sustenance, cover and protection. Perennial grass plants need to store a portion of food production in the stem base and upper roots before the end of the growing season to provide energy for respiration during the dormant season and energy for new growth in the subsequent growing season. The amount of food that the plant can produce, including the amount that can be stored for regrowth, is dependent upon *leaf area* available during the growing season.

Management of leaf area is critical to healthy rangeland and should result in leaving about 50% of total leaf area produced during the growing season by the key plant species; that is, those species that are desired in greater proportion than others in the same plant community. Such management is based primarily on control of grazing animals and does not normally include cultural practices, such as fertilization, cultivation, irrigation or other practices that would be common in agronomic crop management. On the other hand, established pastures composed of a monoculture, often do require such practices as weed control and infrequent tillage, such as subsoiling, in order to maintain the species integrity against invading plants and optimize production and quality of forage. There is an obvious gradient between the application of energy inputs on cropland and rangeland and pasture, with cropland receiving high levels of inputs and rangeland receiving little or none. Pastureland is on the gradient between the other two.

Technology Utilized

The PRF-VI Pilot Program is based on the use of (NDVI) data that has been derived from scanners on satellites observing the changes in greenness of vegetation of the earth since 1989. The vegetation index does not explicitly predict individual forage production on a given producer's operation. Instead, the index is related to the amount of vegetation on earth and the

changes in greenness over time. The index is correlated with forage production but does not directly predict actual forage production. Key components of the PRF-VI Pilot Program include:

- The temperature constrained vegetation index is derived from two data sources. One is the NDVI data from NASA that is processed by EROS, and the second is gridded average daily temperature data produced by the NOAA Climate Prediction Center.

- Losses and payments are based on a sub-county level. The data is collected for 1-km grids (0.6 miles) and then averaged across 8 km or 4.8 mile grids to produce the base value used in the vegetation index. The bi-weekly values are stored on computers at EROS from the maximum observed daily value observed during each 2-week period.

  o Using a ratio of infrared and visible light reflectance from the vegetation, an index of 0.0 to 1.0 is derived which essentially reflects the abundance of vegetation on the ground. The visible light values are sensitive to the amount of green chlorophyll in the plant which can absorb it, while the infrared light is sensitive to the amount of plant cells inside the leaf, which reflect it back to the satellite. Therefore, the more chlorophyll and the more plant cell bulk in the plant the higher the NDVI index recorded by the satellite's sensor.

  o Vegetation can remain green in very cold or very hot weather and yet not grow. There are also examples of pasture species with thick canopies that prevent light from fully penetrating and reflecting back from all leaf surfaces. For these reasons, a temperature correction has been added to correct the final index value. A mathematical function has been added that gives the NDVI more weight when temperatures are close to optimum for plant growth in a region and discounts the index when temperature deviates from this optimum value. Optimum plant growth temperatures are also adjusted for elevation differences between the NDVI grids in a given region.

  o Four intervals were selected for indexing in an annual cycle with each interval having 3-month duration. Interval I begins on April 1 and ends on June 30. After extensive discussions with the subject matter experts it was recognized that there were significant variations between regions of the United States. It was determined that the best way to capture these variations in conditions and allow producers the most flexibility to insure periods in the year that best reflect their local conditions was to divide the year into 4, 3-month intervals. Increasing intervals beyond 3-months reduced signal variability and responsiveness of the index in the higher producing, mixed forest-pastureland conditions of the United States. Choosing one or more 3-month interval allows producers to manage their risk based on their diversity of pasture and rangeland forage.

All of EROS's NDVI data and NOAA's temperature data are subjected to rigorous quality control processes to insure that the data is stable and as accurate as possible. Both datasets are widely used as part of the global monitoring system used by various government agencies, including national security and defense organizations. There are multiple satellite systems that have been placed in orbit that are calibrated to each other so that if one fails they can use the

other system to cover the same area. In addition, NASA plans to launch a series of satellites using the same sensors and mathematics over the next decade to insure continuity of the program.

When the data is reported by EROS and NOAA, computers automatically log onto these sites, download the data and update the index value. The index values are maintained on two separate computer systems and are reported at the end of each 3-month interval. This value is then made available to insurance companies for computation of indemnity payments via RMA's web site.

Program Basics:

The new PRF-VI Pilot Program is a GRP program and utilizes the current GRP Basic Provisions. The program also has Crop Provisions, Special Provisions (See an illustration in Appendix A), and an Insurance Standards Handbook, available on the RMA website.

There are some differences between the traditional GRP programs and PRF-VI Pilot Program. These differences include:

- Terminology differences
    o The use of Grid and Grid ID versus County
    o Insurable and Insured acres versus Planted acres
    o An Index versus Yields
    o Accumulative NDVI based Index versus NASS reported yields

- Basic Definitions
    o **County** - In addition to the definition contained in section 1 of the GRP Basic Provisions, county also includes any acreage of the crop type contained within a grid ID that crosses an adjoining county line where the acreage is contiguous.
    o **County Base Value** - FCIC's determined production value of grazingland and hayland forage acres in the county.
    o **Dollar Amount of Protection per Acre -** In lieu of the definition contained in section 1 of the GRP Basic Provisions, the county base value per acre specified in the actuarial documents for each crop type multiplied by the coverage level selected by you, and multiplied by the productivity factor selected by you. You may select only one dollar amount of protection per acre for each county and crop type.
    o **Grid ID** – A specific code associated with each grid contained in the actuarial documents.
    o **Index Interval –** The periods of time specified in the Special Provisions during which NDVI data is collected that is used to calculate the expected grid index and Final Grid Index. You may select more than one index interval during the crop year for each crop type and grid ID.
    o **Policy Protection per Unit -** The result of multiplying the dollar amount of protection per acre, by your insured acres, by your share for the unit. The policy protection per unit is shown on your Summary of Protection.

- o **Point of Reference** – A designated point, identifiable by longitude and latitude, selected by you in the grid that contains the best representation of the insured acreage covered under these Crop Provisions.
- o **Productivity Factor** – A percentage factor selected by you that allows you to individualize your coverage based on the productivity of the crops you produce and may be between 60 and 150 percent. Only one productivity factor may be selected per county and crop type.
- o **Unit** - The insured acres within a grid ID for each crop type and index interval.
  - ▪ If there are multiple Grid IDs on a policy the index values are not added together, each unit and crop stands on it own.

- The program is Web based; however there are print functions, which allow an agent to print maps and other functions provided on the web site.

- There is no CAT coverage offered at this time.

- An Insured is not required to insure 100% of their acreage.

- Grid ID, crop type, and index interval s will be determined prior to the sales closing date.

- Sales will be suspended and/or terminated if at any time and if for any reason FCIC is not able to receive and process the satellite imagery utilized to determine and publish the Final Grid Index for any particular index interval specified in the Special Provisions (which includes but not limited to, failure or destruction of the satellites and resulting data used for this program). If this occurs any insurance policy and/or protection that is currently in effect will be voided and all premiums received or due will be refunded to you the insured.

Index Terminology

The program is based on an index value versus individual or county yields, and as previously provided in this training package it is based on the NDVI satellite imagery received in a ~4.8 mile by 4.8 mile area (8km by 8km area). The following are the key concepts associated with the Vegetation grid indexes:

- **Grid Index**- A calculated value utilizing each grid's current and historical NDVI gridded data for each grid ID and index interval. The index is expressed as a percentage.

- **Expected Grid Index** – Determined by FCIC based on the mean accumulated NDVI values by index interval calculated using the historical NDVI gridded data, corrected for temperature, normalized, and expressed as a percentage, such that the mean is 100.

- **Final Grid Index** - Determined by FCIC based on the current NDVI values for each grid ID and index interval during the crop year expressed as a percentage. An index of 100 would represent an average value for the grid ID and index interval. An index below 100

would represent below average NDVI values for the grid ID and interval. An index above 100 would represent above average NDVI values for the grid ID and index interval.

- **Trigger Grid Index** – The result of multiplying the expected grid index for the unit by the coverage level selected by you. When the Final Grid Index falls below your Trigger Grid Index, an indemnity may be due.

Index Intervals

Index Interval – The periods of time during which NDVI data is collected that is used to calculate the expected grid index and Final Grid Index.

There will be more than one index interval for each unique crop type and Grid ID. The insurable index intervals are further defined in the Special Provisions with a statement such as: An insured may select more than one index interval for each Grid ID and crop type, however, if an index interval is chosen the insured must place a minimum of 10% of their insured acres in each index interval chosen. The sum of all the insured acres per unit must equal the total number of elected insured acres for each Grid ID by crop type.

The Index Intervals and their respective start and end dates are as follows:

INDEX INTERVALS	START DATE	END DATE
(XXX) Index Interval I	April 1	June 30
(XXX) Index Interval II	July 1	September 30
(XXX) Index Interval III	October 1	December 31
(XXX) Index Interval IV	January 1	March 31

Insured Crop and Crop Types

- **Crop –** Crop is pasture, rangeland, or forage.

- **Crop Types** – Grazingland and Hayland.

- **Grazingland** – Established acreage of forage on land suitable and intended for grazing by livestock. Acreage that is so steeply sloped, too far from water sources, etc., such that livestock would not normally physically graze such acreage is not considered suitable.

- **Hayland –** Established acreage of forage on land suitable and intended for haying. Acreage that is so steeply sloped, covered by water, etc., such that it would be impractical or impossible to mechanically harvest such acreage is not considered suitable.

- **Insurable acreage** – Hayland and grazingland that is not planted annually (unless allowed by the Special Provisions). For the purposes of these Crop Provisions, overseeding into acreage of existing forage crops is an acceptable farming practice and is

not considered an annual planting. Insurable acres will consist of the total number of acres suitable for insurance under these crop provisions which would include both insured acres and acres of the crop type that are not insured.

- **Insured acres** – The number of insurable acres selected by you to be insured.

The insured may choose to insure Grazingland, Hayland, or both. The insured is not required to insure 100% of the crop type (s) acreage chosen in the county; however, if the insured chooses to insure the crop types under the PRF-VI policy they cannot insure the same crop under any other FCIC subsidized program, except as specified in the Crop Provisions.

The insured must report annually by the acreage report date (same as Sales Closing Date) specified on the Special Provisions ALL insurable and insured acres covered under these crop provisions.

The insurance provider may inspect the insured acreage at any time to verify the number of acres insured, the accuracy of the selected point(s) of reference, and the growing conditions of the crop.

Program Dates

- Sales Closing: November 30 (crop type, dollar amount of protection per acre, coverage, Grid ID, index intervals, and items relevant to acreage report)

- Contract Change: August 31

- Acreage Reporting: November 30

- Crop year: April 1 - March 31

- Premium Billing: October 1

Selecting a Grid ID

- **Grid ID** – A specific numeric code associated with each grid contained in the actuarial documents.

The applicant will determine a point of reference and the corresponding Grid ID by the sales closing date for all insured acreage by accessing and using the http://www.rma.usda.gov/ or a successor website.

- **Point of Reference** – A designated point, identifiable by longitude and latitude, selected by you in the grid that contains the best representation of the insured acreage covered under these Crop Provisions.

    - In lieu of section 3(b) of the Group Risk Plan of Insurance Basic Provisions, land located in another grid, county, or state is insurable if that land is part of

contiguous acreage that extends from insured acreage into another grid, county, or state.

- Separate points of reference must be established and reported for each crop type in a grid as follows:

    1. A point of reference must be selected for any insured acreage of the crop that is not contiguous.

    2. In the case of contiguous insured acreage that crosses grid or county lines, a point of reference must be selected as follows:

        i. If the insured chooses to combine the contiguous acreages of the crop type into one single Grid ID, a single point of reference must be established for all of the contiguous acres.

        ii. If the insured chooses to separate the contiguous acreage into separate Grid ID's, they must establish the single point of reference for each Grid ID

- For each grid the insured elects to insure, they must report by grid:

    1. The Grid ID; and

    2. The amount of insurable and insured acreage located within or assigned to the grid.

    For example: If the contiguous acreage is located in four grids and the insured chooses to insure the acreage in separate grids, the acreage can be separated into two, three, or four grids. If the insured selects three grids, they must establish and report the points of reference, the Grid ID, and number of insurable and insured acreage located within, or assigned if applicable, to each grid.

- The same acres cannot be insured in more than one Grid ID or county (except as allowed in the PRF-VI Crop Provisions). The amount of insured acreage will not exceed 100 percent of the policyholder's insurable acreage of the crop type in the county.

Coverage Levels

- CAT policies are not available under these crop provisions.
- **Levels of Coverage -** 70, 75, 80, 85, or 90 percent. For the PRF-VI policy, the insured may select any percentage of coverage shown on the actuarial documents for each crop type.

- In lieu of Section 5(b) of the Group Risk Plan of Insurance Basic Provisions, the selected coverage level multiplied by the expected grid index shown on the actuarial documents is the Trigger Grid Index. If the Final Grid Index published by FCIC for the insured unit falls below the Trigger Grid Index, the insured may be due an indemnity payment.

- The insured may select **only one** coverage level for each of the insured crop types in the county.
- Because CAT is not offered, Non-insured Assistance Program (NAP) is still available from Farm Service Agency (FSA) county offices.

Policy Protection

- CAT policies are not available under these crop provisions.

- **County Base Value** - FCIC's determined production value of grazingland and hayland forage acres in the county.

- **Productivity Factor** – A percentage factor selected by you that allows you to individualize your coverage based on the productivity of the crops you produce and may be between 60 and 150 percent. Only one productivity factor may be selected per county and crop type.

- **Dollar Amount of Protection per Acre** – The dollar amount of protection per acre will be equal to the county base value per acre specified in the actuarial documents for each crop type multiplied by the coverage level selected by you, and multiplied by the productivity factor selected by you.

- Insured may select **only one** dollar amount of protection per acre for each crop type.

  $ Amt of Protection per Acre = county base value (CBV) x coverage level selected (CL) (70% - 90%) x productivity factor selected (PF)(60% - 150%)

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  EXAMPLE = $17.65 (CBV) *x*.85 (CL) *x* 1.20 (PF)
  = $18.00 per Acre

  </div>

- **Policy Protection per Unit** – The result of multiplying the dollar amount of protection per acre, by your insured acres, by your share for the unit. **Note:** *for each grid ID and crop type, insured acreage may be allocated to one or more index intervals. The minimum percentage of insured acres allowed in any one index interval, by grid ID and crop type, is specified in the Special Provisions.*

  EXAMPLE: $18.00 x 500 ac (for Index Interval II) x share (100%) = $9,000
  and $18.00 x 500 ac (for Index Interval III) x share (100%) = $9000

- **Policy Protection** - is the sum of the policy protection per units, and in this example equals $8,010.

  EXAMPLE: $18.00 x 1,000 acres = $18,000

Determining Premium and Subsidy

- Determine the Premium rate per unit using the premium rate and subsidy tables provided in the actuarial documents, the PRF-VI Reports (rates and subsidies), or by contacting a qualified agent.

  - o Premium rate per unit

    - Refer to the premium table

    - Must apply the applicable Premium Rate for each Grid ID, crop type, and index interval

  - o Premium per unit =
    $ amount of protection/acre
    x number of insured acres/unit
    x premium rate
    x adjustment factor of 0.01
    x share

  - o Premium subsidy per unit =
    Premium per unit
    x subsidy rate

  - o Producer premium per unit =
    Premium per unit – Premium subsidy per unit

  - o **Total Policy Premium** - The sum of all "premium per unit" values for the policy equals the Total Policy Premium.

  - o **Total Subsidy** - The sum of all "premium subsidy per unit" values for the policy equals the Total Subsidy for the policy.

  - o **Total Producer Premium** - The sum of all "producer premium per unit" values for the policy equals the Total Producer Premium for the policy.

Trigger Payment Calculations

- Payment calculation factor will be [(your Trigger Grid Index – Final Grid Index) ÷ your Trigger Grid Index] for the purposes of calculating an indemnity payment, for each basic unit selected.

  - o A payment may be made only if the Final Grid Index for the insured unit is less than the Trigger Grid Index.

  - o If a payment is owed, it will be issued to the insured not later than 60 days following the determination of the Final Grid Index for the grid ID and index interval insured.

  - o The payment will be equal to the payment calculation factor multiplied by the policy protection per unit.

- The payment will not be recalculated once the Final Grid Index is calculated and reported (as specified in the Special Provisions) even though NOAA may subsequently revise the weather grid data.

      EXAMPLE:
      Payment Calculation Factor
      (Trigger Grid Index – Final Grid Index)/Trigger Grid Index

      Trigger Grid Index (Coverage Level) = 85

      Final Grid Index
      Final Grid Index: II = 90, III = 60
      Payment Calculation Factor =
            (85 – 90)/85 = Final Grid Index above Trigger grid Index
            (85 – 60)/85 = 0.294

      Total indemnity = **$2,646.** (II = $0, III =$2,646)

      Index interval II = **$0.0**
      Index interval III (500 acres) = **$2646**
      {$18.00 x 500 (acres in III) x 1.0 (share)} x 0.294 = $2646

- An expanded example to demonstrate how the PRF-VI policy works is located in the crop provisions (Appendix B through Appendix D) as well as the following sections of this Training manual.

Causes of Loss

- Loses are only paid when the Final Grid Index is less than your Trigger Grid Index.

- The reduction in the Final Grid Index must be due to natural occurrences.

- A reduction in the Final Grid Index due to a cause other than a natural occurrence will result in the assignment of a value to the Final Grid Index in an amount determined to correspond to the reduction due to natural occurrences only.

How the Final Grid Index is Reported

The Final Grid Index will be available on the RMA website following the end date of each index interval.

Program Instructions:

The following section provides descriptions and the key processes associated with the purchase, sale, and servicing of the program. A detailed description and step-by-step instructions for each of the components contained in this section of the training manual is further explained in Appendix B through Appendix D.

Use of the website

A full description and step by step instruction guide for *Determining Grid ID(s)* and *Use of the Website* is included in Appendix C.

Locating the Website

When reviewing the possibility of purchasing a policy, internet access is necessary. Locating and using the website can be completed at any location that has web access. The speed of the display on each screen is determined by each individual computer's speed and the internet connection capabilities.

To start, a user would go to http://www.rma.usda.gov/policies/pasturerangeforage or a successor website.

Navigating the Website

The first and one of the most important step is to accurately identify the Grid ID(s). The current website address for determining Grid ID(s) is:

http://prfvi-rma-map.tamu.edu

Additional information on navigating the website is contained in Appendix C.

The Photo Map (Layer)

There are two map types available to assist the applicant in locating their property. The first type is a topo map, while the second type, the photo map, displays greater detail, which helps the applicant identify landmarks on their property. The Grid IDs are identified with a thick blue line and the Grid ID numbers are identified on the map in large bold numbers. The point of reference is shown with a bold '+'. The maps can be resized to assist in the viewing and printing of the locations of the gridlines.

Within the map, the '+' represents the current location and the point of which the information is gathered. Directly above the map, the state and county of the red + is listed. In addition, the latitude and longitude coordinates and the Vegetation Index Grid ID numbers are provided.

The goal is to position the '+' over the most representative location of the insured's acreage, also known as the point of reference. The '+' can be moved by either clicking on the map or by

clicking on the *N*, *S*, *E*, or *W* arrow buttons located around the perimeter of the map. To the right of the map, the resolution of the map can be increased or decreased.

Locating the Insured's Acreage

The basic steps for an insured to find his acres are included, with a more detail description provided in Appendix C. An individual applicant may have more than one acreage location and will need to go through the steps provided in Appendix C for each location. A Grid ID must be selected for each location that is insured. This information will assist the insured in determining how many Grid IDs will be needed.

Step 1   Type in the city and/or county name where the property is located (if no response is provided for the city the applicant typed in, select a larger city near the property).

Step 2   Select the city or county from the possible matches available on the display. By clicking on the link, a topo map for the area will be displayed.

Step 3   Narrow the search by selecting an area near where the property to be insured is actually located. The area can be narrowed by either clicking on the map or clicking on the *N*, *S*, *E* or *W* arrows located around the perimeters of the screen. The area can be refined even further by increasing the resolution of the map.

Step 4   It is recommended that once the applicant has located the general area where the property is located, that they continue to refine the search by switching to the photo maps.

Step 5   Using the topo map, photo map, or combination of both, the applicant needs to choose an appropriate size of view that allows for proper identification of the property boundaries and the corresponding Grid ID(s).

Determining the Grid ID(s)

By using the steps previously outlined, in addition to those provided in Appendix C, the applicant should be able to locate their acreage and corresponding Grid IDs on the map. This section discusses the specific guidelines in choosing Grid ID(s).

When selecting a Grid ID, several options are available to the applicant, depending on their circumstances and the location of their acreage. The following table is a quick reference on the insured's grid options and provides basic information on the various options available to the applicant. Using this information, an applicant can go directly to the relevant section in Appendix C that best represents the property or the mixture of properties, for additional information.

Type of Acreage	Grid Information	Guideline	See Section
Contiguous Acreage	Single Grid	Choose one point of reference	A (1) Contiguous Acreage – One Grid
Contiguous Acreage	Multiple Grids – Combined	Choose one point of reference	A (2) Contiguous Acreage – Multiple Grids (Combined)
Contiguous Acreage	Multiple Grids – Separated	Choose one point of reference for each Grid selected or assigned as applicable	A (3) Contiguous Acreage – Multiple Grids (Separated)
Non-Contiguous Acreage (multiple properties)		Choose one point of reference for each, separate, non-contiguous acreage in the county.	B Non-Contiguous Acreage

It is also important to note that the same acres cannot be insured in more than one Grid ID or county, and the amount of insurable acreage will not exceed 100 percent of the insured's actual acreage of the crop in the county.

- **Determining the Grid ID(s) for Contiguous Acreage**
  Contiguous acreage may all be contained in one Grid ID, or may spread into more than one Grid ID and/or county. If the acreage crosses into more than one grid and/or county, all contiguous acreage of the crop type may be combined into a single Grid ID using one point of reference for all of the acreage, including the acreage extending into an adjoining numbered grid or county. Or, the insured may chose to separate the insured acreage into unique, separately numbered Grid IDs where the acreage is located.

- **Determining the Grid ID(s) for Non-Contiguous Acreage**
  A point of reference must be selected for each separate, non-contiguous acreage area of the crop that is located in the county. The steps in determining the point of reference are similar to the steps outlined for contiguous acreage, depending on whether or not the acreage crosses grid and/or county lines. These steps are repeated for each non-contiguous acreage area to be insured.

Other Links on the Website

In addition to the link described above, there are additional links on the Pasture, Rangeland, Forage webpage that are useful to the applicant. When these additional links are selected the insured will be able to view other options and data related to the PRF-VI Pilot Program. Once a link is selected follow the on line options to view the information desired.

Completing the PRF-VI Worksheet

An example and step-by-step instructions for completing the PRF-VI Worksheet is included in Appendix B.

- The PRF-VI Worksheet is provided to assist the agent in determining the insured's policy protection and premium.

- To assist the agent, a separate worksheet should be completed for each county and crop type insured.

- Additional appendices are provided in the handbook to assist the applicant in:
    - Determining Grid ID(s) and Use of the Website (Appendix C)
    - Pasture, Rangeland, Forage Vegetation Index Example (Appendix D)

PRF-VI Example

Appendix D contains a detailed example of the PRF-VI Pilot Program.

The first half of this example guides a producer, Joe Rancher, through the basic information needed at the time of sign up. The second half of this example illustrates how the premium will be determined and how indemnities will be calculated at the time of loss.

Availability and Use of the PRF-VI Decision Tool

One of the risk management tools included with the website is the PRF-VI Decision Tool. This tool is not part of the program, but it is intended to provide producers and agents with knowledge of how the "group" program correlates to the individual's production risk. For example, a producer may know his/her production records for a given year – with the decision tool, they can select that year and study how the index would have responded.

A producer or agent can access the decision tool from the Main Menu or from the Grid ID Locator screen. The basic steps for using the calculator are:

Step 1   Select the PRF-VI Decision Tool link on Main Menu, or from the menu options on the map screens.

Step 2   Complete the information.
- The information the user must supply is given in yellow and includes: state, county, grid ID, insured crop type, coverage level, productivity factor, number of insurable acres, sample year to compare, and the percent of acreage selected for each index interval.
- It is important to remember the minimum acreage allowed in any one index interval is specified in the Special Provisions of Insurance

Step 3   Once the information is selected, hit the 'Submit Query' button. It is important to note that if any of the information is changed, the "Submit Query" button must once again be activated.

Step 4   Once the information has been submitted, a summary of information will be returned for the user/applicant to consider.

Again, it is important to note that the decision tool is not part of the program or required to participate in the program – its objective is to provide producers and agents with information that could be used to best tailor the program for the producers' risk management needs.

This tool provides estimates for indemnity, premium, and subsidy values for the PRF-VI Pilot Program. These values are based on current information to derive historical estimates of indemnity, premium, and subsidy numbers and may not match the official figures released by FCIC in past years. Contact a qualified insurance agent for actual premium quotes.

Appendix A: Illustration of Special Provisions

Special Provisions Of Insurance
2007 And Succeeding Crop Years

ST: Colorado (08)   CROP: PASTURE, RANGELAND, FORAGE (0088)
CO: County (XXX)   PLAN: GRP Vegetation Index (14)

THE SPECIAL PROVISIONS OF INSURANCE IS THE PART OF THE POLICY THAT CONTAINS SPECIFIC
PROVISIONS OF INSURANCE FOR THE INSURED CROP IN THE COUNTIES WHERE INSURANCE IS
AVAILABLE.

INSURABLE TYPES AND PRACTICES

TYPE(S)	PRACTICE(S)
-----------	------------------
(063) Hayland	(231) Index Interval I
(063) Hayland	(232) Index Interval II
(063) Hayland	(233) Index Interval III
(063) Hayland	(234) Index Interval IV
(064) Grazingland	(231) Index Interval I
(064) Grazingland	(232) Index Interval II
(064) Grazingland	(233) Index Interval III
(064) Grazingland	(234) Index Interval IV

PROGRAM DATES FOR INSURABLE TYPES AND PRACTICES:

SALES CLOSING	EARLIEST PLANTING	FINAL PLANTING	ACREAGE REPORTING	PREMIUM BILLING

TYPE(S)	PRACTICE(S)
-----------	------------------
ALL TYPES LISTED ABOVE	ALL PRACTICES LISTED ABOVE

SALES CLOSING	EARLIEST PLANTING	FINAL PLANTING	ACREAGE REPORTING	PREMIUM BILLING
11/30/2006			11/30/2006	10/01/2007

CROP STATEMENT(S):
Contact your agent regarding possible premium discounts, options, and /or additional coverage that may be
available.

PRACTICE STATEMENT(S):

An insured may select more than one index interval for each Grid ID and crop type, however, if an index interval is chosen the insured must place a minimum of 10% of their insured acres in each index interval chosen. The sum of all the insured acres per unit must equal the total number of elected insured acres for each Grid ID by crop type.

The Index Intervals and their respective start and end dates are as follows:

INDEX INTERVALS	START DATE	END DATE
(231) Index Interval I	April 1	June 30
(232) Index Interval II	July 1	September 30
(233) Index Interval III	October 1	December 31
(234) Index Interval IV	January 1	March 31

```
|------------PREMIUM SUBSIDIES AND FEES-------------|
|Coverage Level          | 70    75    80    85    90 |
|Premium Subsidy Factor  | .64   .64   .59   .59   .55 |
|Administrative Fee      | $30   $30   $30   $30   $30 |
|-------------------------------------------------------------------|
```

INSURANCE AVAILABILITY STATEMENT(S):
The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, parental status, familial status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program.

APPROVED: ACTUARIAL DIVISION XX/XX/200X

Appendix B: Pasture, Rangeland, Forage Vegetation Index Worksheet

1. Insured's Name: _____ 2. Date: ___ / ___ / _____ 3. State: _____ (___) 4. County: _____ (___)

5. Crop Type: _____ 6. Coverage Level/Trigger Index: _____ 7. Productivity Factor: _____ % 8. $ Amt. of Prot/Ac: _____

9. Grid ID	10. Insurable Acreage	11. Insured Acreage	12. Share	13. Index Interval	14. Unit Number	15. % Insured acreage/ Unit	16. Insured acreage/ Unit	17. Policy Protection/ Unit	18. Premium Rate/$100	19. Premium/ Unit	20. Premium Subsidy Amt	21. Premium Due From Grower
				percentage		*percentage*	*acres*	*dollars*	*dollars*	*dollars*	*dollars*	*dollars*
				I								
				II								
				III								
				IV								
				Total								
				I								
				II								
				III								
				IV								
				Total								
				I								
				II								
				III								
				IV								
				Total								
				I								
				II								
				III								
				IV								
				Total								
County Totals	10a.	11a.					16a.	17a.		19a.	20a.	21a.

Prepared by: _____ (Agent's Signature)   Insured's Initials: _____

Pasture, Rangeland, Forage Vegetation Index Worksheet Completion Procedures

A.   GENERAL INFORMATION

(1)   The PRF-VI Worksheet is provided to assist the agent in determining the insured's policy protection and premium.

(2)   To assist the agent, a separate worksheet should be completed for each county and crop type insured.

(3)   Additional appendices provided in the handbook include:
   o   Determining Grid ID(s) and Use of the Website (Appendix C)
   o   PRF-VI Example (Appendix D)

B.   WORKSHEET ENTRIES AND COMPLETION INFORMATION

Verify or make the following entries:

Item No.	Information Required
1.	**Insured's Name:** Enter the name of the insured that identifies exactly the person (legal entity) to whom the policy is issued.
2.	**Date:** Enter the date the form was completed (MM/DD/YYYY).
3.	**State:** Enter the state in which insurance attaches and corresponding 2-digit state code.
4.	**County:** Enter the county in which insurance attaches and the corresponding 3-digit county code. The PRF-VI Worksheet is provided for acreage in one county. For multiple counties, use a separate worksheet.
5.	**Crop Type:** Select grazingland or hayland. If the insured is selecting both types available, a separate worksheet should be completed for each crop type. Grid ID(s), coverage level, and dollar amount of protection per acre will be selected for each crop type in the county. A separate worksheet should be completed for each crop type selected.
6.	**Coverage Level (or Trigger Grid Index):** Enter 70, 75, 80, 85, or 90 percent in the space labeled 6. For PRF-VI policies, the insured may select any percentage of coverage shown on the actuarial documents or PRF-VI reports (rates and subsidies)

for each crop type. Refer to the PRF-VI Crop Provisions, Special Provisions of Insurance, and GRP Basic Provisions.

Enter only one level of Coverage for the crop type in the county. The level of coverage selected by the applicant will be applied to each unit (Grid ID, crop type, and index interval).

The expected grid index will always equal 100, so the **Trigger Grid Index:** will equal the coverage level selected. [75 (coverage level) x 100 (expected grid index) = 75 (Trigger Grid Index)].

7.   **Productivity Factor:** A percentage factor selected by the insured that allows them to individualize their coverage based on the productivity of the grazingland or hayland they produce. A percentage value between 60 and 150 percent should be entered in this space.

8.   **Dollar Amount of Protection per Acre:** Defined as*: the county base value per acre specified in the actuarial documents for each crop type multiplied by the coverage level selected by you, and multiplied by the productivity factor selected by you.*

County base value x coverage level selected (#6) x productivity factor selected (#7). Enter the result in item 8.

Example: dollar amount of protection per acre = county base value per acre ($20.00), times the coverage level selected (90), times productivity factor selected 120%. ($20.00 x .90 = $18) ($18 x 120% = $21.60).

Enter only one Dollar Amount of Protection per Acre for each crop type in the county. You may select **only one** coverage level and corresponding dollar amount of protection per acre for each of the insured crop types in the county. The dollar amount of protection per acre selected will be applied to each Grid ID and crop type.

9.   **Grid ID (s):** Enter the specific number(s) associated with each grid (established by FCIC utilizing gridded data from EROS), that will be contained on the summary of coverage

See Appendix C for instructions on obtaining the applicable Grid ID(s) for the insured's acreage.

10.   **Insurable Acreage**: Enter the amount of Insurable acreage (*will consist of the total number of acres suitable for insurance under these crop provisions which would include both insured acreage and acres of the crop type that are not insured*) for each Grid ID, Total the amount of insurable acreage in the space labeled 10a.

11.   **Insured Acreage**: Enter the number of insured acreage for each Grid ID. Total the number of acres in the space labeled 11a.

12. **Share:** Enter the applicable share, as a percentage, for each Crop Type, and Grid ID combination.

13. **Index Interval:** Enter the code(s) associated with each Index Interval. The codes can be found in the Special Provisions of Insurance.

14. **Unit Number:** Assign a unit number for each crop type and Index Interval for each Grid ID. For example: Grid 1 has two different intervals insured – units = 00100, 00200; Grid 2 has three different intervals insured – units = 00100, 00200, 00300.

15. **Percentage of Insured Acreage by Index Interval**: The insured may designate a specific percentage of the insured acreage to more than one index interval (index interval are designated as Roman numerals in the worksheet i.e. I = Index Interval I…IV = Index Interval IV) for each Grid ID and crop type. The sum of all the percentages (shown in red in the "Total" row) for each Grid ID must equal 100%.

    The percentage of insured acres required in any one index interval (Index Interval I through VI) is further defined in the Special Provisions of Insurance.

16. **Amount of Insured Acreage by Index Interval**: For each index interval, enter the result of multiplying the percentage of insured acreage per index interval (item row 13) x the insured acreage for each Grid ID (item row 11). Total the index interval by Grid ID and enter the sum in the "Total" row. The Total row of all insured acreage/index interval for each Grid ID must equal the total insured acres by Grid ID (item row 11).

    The minimum percentage of acreage required in any one index interval (Index Interval I through IV) is further defined in the Special Provisions of Insurance.

17. **Policy Protection per unit:** For each index interval, enter the result of the Dollar Amount of Protection per Acre (item 8) x number of insured acreage/index interval (item row 14) x the share (item row 12.).

    The Policy Protection - will equal the sum of all the insured's policy protection per units; enter this value in item 15a.

18. **Premium Rate/ $100 of Insurance:** Enter the premium rate for each Grid ID, crop type, and index interval. Refer to the premium rate tables available from your insurance provider or the PRF-VI Coverage, Rate and Index Reports, to find the applicable premium rate.

19. **Premium per Unit:** Enter the result of the dollar amount of protection per acre (item 8) x number of insured acreage per unit (item row 14) x premium rate (item row16) x adjustment factor of 0.01 x share (item row 12), for each index interval/unit (Grid ID, crop type, and Index interval).

Total policy premium (each index interval) equals the sum of the premiums for each unit. Enter the result in 17a.

20.   **Premium Subsidy per Unit**: Enter the result of the Premium per Unit (item 17) for each index interval/unit x the applicable Subsidy Percentage. Refer to the subsidy tables provided in the Pasture, Rangeland, Forage Coverage, Rate and Index Reports to find the applicable Subsidy Percentage. The subsidy allowed is determined by the level of coverage selected by the applicant.

Total premium subsidy (each index interval/unit) equals the sum of the premium subsidy for each unit. Enter the result in in 18a.

21.   **Producer Premium per Unit**: Enter the result of the Premium per unit (item row 17) minus the Premium subsidy per unit (item row 18) for each index interval/unit (Grid ID, crop type, Index interval).

Total Producer Premium equals the the sum of all the producer premiums per unit for each index interval. Enter the result in item 19a.

Appendix C: Determining Grid ID(s) and Use of the Website

Introduction

As stated in the Pasture, Rangeland, Forage (PRF) Vegetation Index policy provisions, a Grid ID is a specific code associated with each grid, contained in the actuarial documents. A Grid ID is determined based on a point of reference selected by you, which must be established by the sales closing date. Because a grid is approximately 4.8 miles (8km) by 4.8 miles in size, RMA has provided a web-based tool accessible on RMA's website, http://www.rma.usda.gov/ or a successor website, as a method to accurately identify the applicable Grid ID(s) for the insured's acreage.

The tool has been developed as an interactive website that a user can navigate through to various screens to collect information and establish a Grid ID. The tool will also allow a provider/agent to print any of the screens that appear on the site. It is recommended that when an insured selects a point of reference from the website, a printed copy (select the print button at the bottom right hand corner of the page) of the screen with the map and corresponding point of reference (which contains state, county, grid, longitude, latitude, and other information related to location), should be placed in the file, for verification purposes. Additional details on these and other tools are provided in this Appendix.

Locating the Website

Locating and using the website can be completed at any location that has web access. The speed of the display on each screen is determined by each individual computer's speed and the internet connection capabilities. The tools available for the PRF Vegetation Index are located at the PRF gateway page, http://www.rma.usda.gov/policies/pasturerangeforage, or a successor website.

Navigating the Website

The first and one of the most important steps is to accurately identify the Grid ID(s). A direct link to RMA's web-based tool is available on the PRF gateway page under Vegetation Index. The web address for the tool is http://prfvi-rma-map.tamu.edu. This link brings you to the default page for the map driven Grid ID locator for the PRF Vegetation Index pilot program.

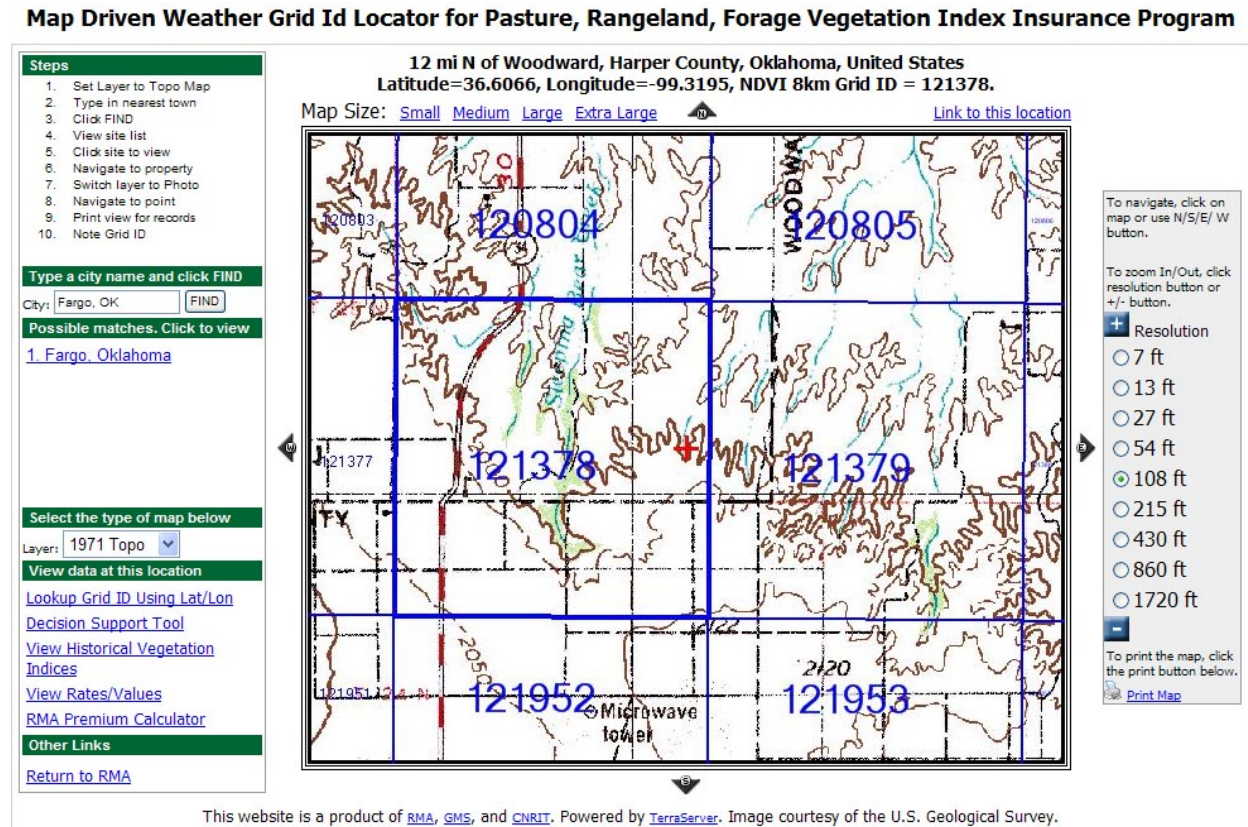The following screen is displayed, which is the default topo map:

Figure 1. Establish Reference Point and Grid ID Default Page, Topo Map

Description of the Screen
The middle of the screen displays the topo map (Figure 2). The map size can be changed by clicking on the "Small", "Medium", "Large", or "Extra Large" link located directly above the map. For purposes of these directions, a small map is displayed.

Within the map, the red '+' represents the current location and the point where information is collected. Above the map, the state and county of the red '+' is listed. In addition, the latitude and longitude coordinates and the Vegetation Index 4.8 mile (8 km) x 4.8 mile Grid ID's are provided.

The goal is to position the red '+' over the most representative location of the insured's acreage, also known as the point of reference. As defined in the policy, a point of reference is: - "*A designated point, identifiable by longitude and latitude, selected by you in the grid that contains the best representation of the insured acreage covered under these Crop Provisions.*" The red '+' can be moved by either clicking on the map or by clicking on the *N*, *S*, *E*, or *W* arrow buttons located around the perimeter of the map. To the right of the map, the resolution of the map can be increased or decreased. By increasing the resolution, or clicking on a smaller number, the map will zoom to a more exact location. Decreasing the resolution will expand the map, including a larger area.

Directly overlaying the map, square grids, outlined by a blue line, give an approximate visual representation of where the Grid IDs are located. For instance, on the default map shown, the red '+' is located just inside of Grid ID #168483. The Grid ID where the red '+' is located can be confirmed by looking above the map where the Vegetation Index Grid ID is listed.

The map can be printed at any time by clicking the "Print Map" icon located at the bottom right hand corner of the screen. It is recommended that a map be printed with each point of reference on an insured policy for verification purposes.

Menu Options
Along the left side of the screen, there is a list of menu options. The options and their descriptions are as follows:

Steps
1. **Set Layer to Topo Map**
2. **Type in nearest town**
3. **Click FIND**
4. **View site list**
5. **Click site to view**
6. **Navigate to property**
7. **Switch layer to Photo**
8. **Navigate to point**
9. **Print view for records**
10. **Note Grid ID**

Lists the ten basic steps to determine the Grid ID. Conveniently located on the screen at all times.

Type a city name and click FIND

City: [College Station] [FIND]

Search function of a nearby city to the insured acreage. After the city or county is typed in, click "Find".

Possible matches. Click to view

1. College Station, Arkansas
2. College Station, Texas
3. College Station, Florida

If more than one city is returned, a list of possible matches is given. Click on the correct city and state combination link to view the correct map.

Select the type of map below

Layer [1974 Topo ▼]

Shows the type of map being displayed. In the drop down box (found by clicking on the gray arrow) the map type can be changed to topo or photo. It is usually easier to begin with a topo map.

View data at this location

Lookup Grid ID Using Lat/Lon
Decision Support Tool
View Historical Vegetation
  Indices
View Rates/Values
RMA Premium Calculator

This section on the page will provide access to additional data sets available for the PRFRI insurance program. To access the data, click on the link.

Click the link below to return

Return to RMA

The Photo Map (Layer)

As previously mentioned, there are two map types available to assist the applicant in locating their property. The first type, the topo map, was previously displayed. The second type, the photo map, displays greater detail, which helps the applicant identify landmarks on their property. As with the topo map, the Grid IDs are identified with a blue line and the Grid ID's are identified on the map in yellow. The point of reference is shown with a yellow '+'. Again the map can be resized to assist in the viewing and the locations of the gridlines.

Figure 2. Photo Map Example

Locating the Insured's Acreage – Basic Steps

This section lists the Basic Steps of how to find the location of insured's acreage by using the program's website. These steps will help to determine if the acreage is contained in a single grid or crosses over into more than one grid. An individual applicant may have more than one acreage location and will need to go through the steps for each location. A Grid ID must be selected for each location that is insured. This information will assist the insured in determining how many Grid IDs will be needed.

Step 1   Type in the city and/or county name where the property is located (if no response is provided for the selected city, select a larger city near the property).

Step 2   Select the city or county from the possible matches available on the display. By clicking on the link, a topo map for the area will be displayed.

Step 3   Narrow the search by selecting an area close to where the property to be insured is actually located. The area can be narrowed by either clicking on the map or clicking on the *N*, *S*, *E*, or *W* arrows located around the perimeters of the screen. The area can be refined even further by increasing the resolution of the map.

Step 4   It is recommended that once the applicant has located the general area where the property is located, that they continue to refine the search by switching to the photo maps.

Step 5   Using the topo map, photo map, or combination of both, the applicant needs to navigate around the maps and choose an appropriate size of view that allows for proper identification of the property boundaries and the corresponding Grid ID(s).

If an insured wishes to determine the location of acreage and Grid ID(s) by utilizing Latitude and Longitude, click on the link under **Vegetation Index** which reads **Grid ID Locator - Longitude/Latitude Lookup.** Once the link is selected follow the on-screen options. It is important to point out that the Latitude and Longitude must be recorded in the format specified to accurately determine the Point of Reference. Latitude and Longitude must be selected for each location that is insured.

Determining the Grid ID(s) – Specific Guidelines

By using the steps previously outlined, the applicant should have been able to locate their acreage and corresponding Grid IDs on the map. This section discusses the specific guidelines in selecting appropriate Grid ID(s).

When selecting a Grid ID, several options are available to the applicant, depending on their circumstances and the location of their acreage. Therefore, go to the section that best represents the property or the mixture of properties. The following table is a quick reference on the insured's grid options and gives information on which section to refer to below for additional information.

Type of Acreage	Grid Information	Guideline	See Section
Contiguous Acreage	Single Grid	Choose one point of reference	A (1) Contiguous Acreage – One Grid
Contiguous Acreage	Multiple Grids – Combined	Choose one point of reference	A (2) Contiguous Acreage – Multiple Grids (Combined)
Contiguous Acreage	Multiple Grids – Separated	Choose one point of reference for each Grid ID selected or assigned as applicable	A (3) Contiguous Acreage – Multiple Grids (Separated)
Non-Contiguous Acreage (multiple properties)		Choose one point of reference for each, separate, non-contiguous acreage in the county.	B Non-Contiguous Acreage

It is also important to note that the same acres cannot be insured in more than one Grid ID or county and the amount of insured acreage will not exceed 100 percent of the insurable acreage of the crop in the county.

A. Determining the Grid ID(s) for Contiguous Acreage

Contiguous Acreage is defined as: - *"Acreage of an insured crop owned by you, or rented by you for cash or crop share, in a county or grid that continues into an adjoining county or grid without interruption. Acreage separated by only a public or private right-of-way, waterway, or an irrigation canal will be considered contiguous."*

Contiguous acreage may all be contained in one Grid ID or may spread into more than one Grid ID and/or county. If the acreage crosses into more than one grid and/or county, all contiguous acreage of the crop type may be combined into a single Grid ID using one point of reference for all of the acreage, including acreage that extends into an adjoining numbered grid or county Or, the insured may chose to separate the insured acreage into separately numbered Grid IDs where the acreage is located.

(1) Contiguous Acreage – One Grid

If the insured's acreage is contiguous and located entirely within one grid and county, use the five Basic Steps previously listed to locate the insured's acreage and conduct the following steps:

Step 6   The insured must then pick **one** point of reference on the property by moving the red (or yellow, depending on the type of map being viewed) '+' to that location. The Vegetation Index Grid ID listed at the top of the screen (and on the map itself) will be the Grid ID used in the policy.

Step 7   Click on the Print Icon in the lower right hand corner of the screen and print the map. This map will be used as a record to verify the Grid ID. Once printed the property boundary can also be outlined and initialed by the insured for verification purposes.

Step 8   The insured must certify that the point of reference chosen is the best representation of the insured acreage that can be determined.

For example, as shown in Figure 4, the Insured's Acreage is contiguous and located entirely in Grid 1. Therefore, the point of reference is chosen on the property and Grid 1 will be the only Grid ID used in the policy.
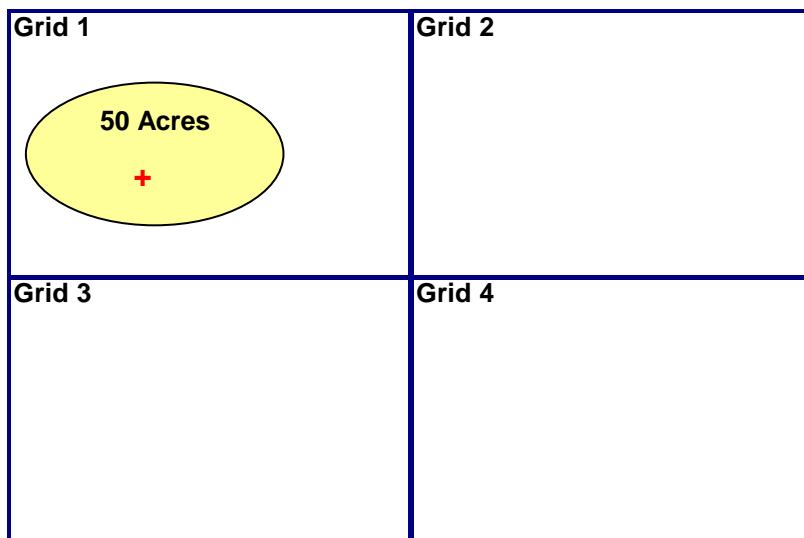
Figure 3. Contiguous Acreage - One Grid

(2) Contiguous Acreage – Multiple Grids (Combined)

If the insured's acreage is contiguous and crosses into more than one grid and/or county, the insured has the option to **combine** the grids and/or counties and choose **one** reference point for the entire contiguous acreage. Use the five Basic Steps listed above to find the insured's acreage and add the following steps:

Step 6   The insured must then pick **one** point of reference in the contiguous acreage by moving the red + to that location. The Vegetation Grid ID listed at the top of the screen (and in yellow on the map itself) will be the Grid ID used in the policy.

Step 7   Click on the Print Icon in the lower right hand corn of the screen and print the map. This map will be used as a record to verify the Grid ID. Once printed the property boundary can also be outlined and initialed by the insured for verification purposes.

Step 8   The insured must certify that the point of reference chosen is the best representation of the insured acreage that can be determined.

For example, in Figure 5 below, the insured's acreage is located in Grid 1 and Grid 2. The insured chose to combine the acreage; therefore, they will choose one point of reference to represent all of their acreage in both Grid 1 and Grid 2. In this example, the point of reference is in Grid 1, therefore Grid 1 will be the only Grid ID used in the policy.
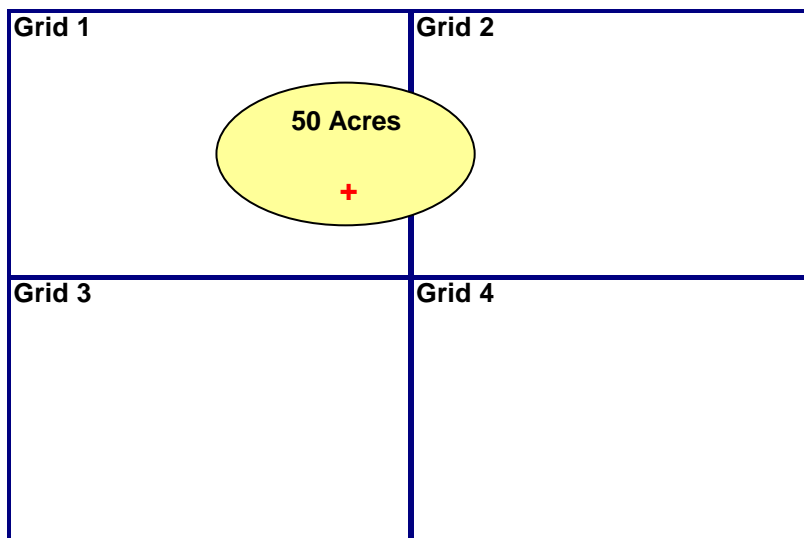
Figure 4. Contiguous Acreage - Multiple Grids (Combined)

(3) Contiguous Acreage – Multiple Grids (Separated)

If the insured's acreage is contiguous and crosses into more than one grid and/or county, the insured can choose a point of reference for each grid and/or county and separate the acreage by Grid ID and/or county. If the insured chooses to separate the acreage into separate numbered Grid IDs, one reference point will be selected in each Grid ID. Each Grid ID would be insured as a separate unit. If acreage is separated into a different county, a new policy for an additional county must be written.

Use the five Basic Steps previously listed to locate the insured's acreage and add the following steps:

Step 6   The insured must then pick **one** point of reference in each Grid by moving the red '+' to that location. The Vegetation Grid ID listed at the top of the screen (and in yellow on the map itself) will be the Grid ID used in the policy.

Step 7   Click on the Print Icon in the lower right hand corn of the screen and print the map. This map will be used as a record to verify the Grid ID. Once printed the property boundary can also be outlined and initialed by the insured for verification purposes.

Step 8   The insured must certify that the point of reference chosen is the best representation of the acreage that can be determined.

Step 9   The insured must certify and assign the approximate amount of insured acreage in each grid.

Steps 6 through 9 must be repeated for each grid that will be insured separately. If acreage is separated into a different county, a new policy for an additional county must be written.

For example, in Figure 6, the insured's acreage is located in Grid 1 and Grid 2. The insured chose to separate the acreage by Grid ID; therefore, choosing a point of reference in Grid 1 and a point of reference in Grid 2. In this example, the insured would certify and assign that there is approximately 35 acres in Grid 1 and 15 acres in Grid 2.
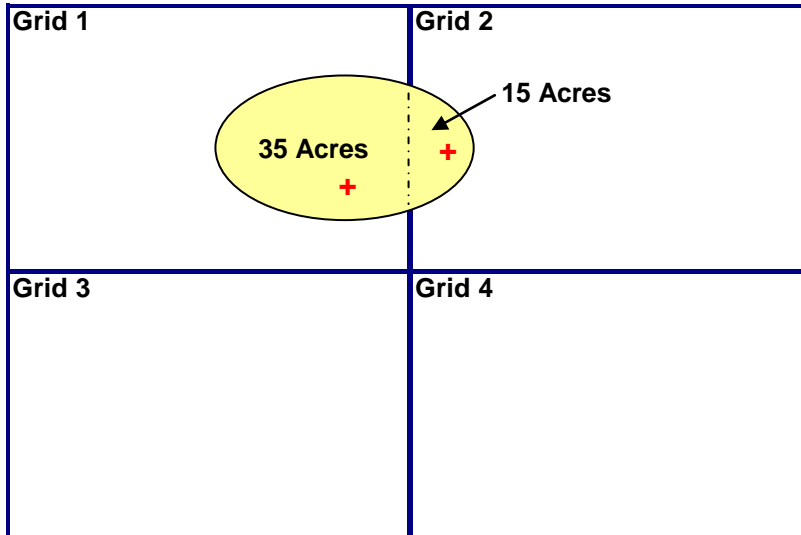
Figure 5. Contiguous Acreage - Multiple Grids (Separated)

B. Determining the Grid ID(s) for Non-Contiguous Acreage

A point of reference must be selected for each separate, non-contiguous insured acreage of the crop that is located in the county. The steps in determining the point of reference are similar to the steps outlined for contiguous acreage, depending on whether or not the acreage crosses grid and/or county lines, and is repeated for each non-contiguous acreage area to be insured.

For example, in Figure 7, the insured has two separate acreage locations in two grids. The insured would have to pick a point of reference in Grid 1 and a point of reference in Grid 4 and insure the two properties separately.
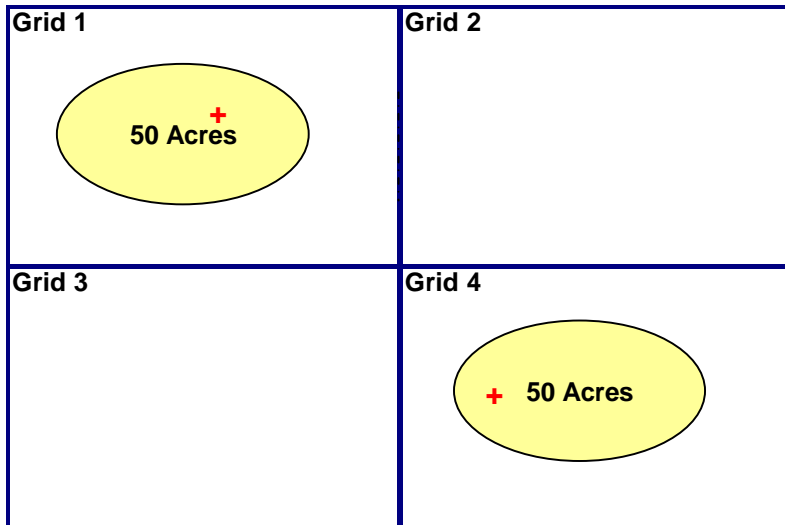
Figure 6. Non-contiguous Acreage Located in Separate Grids

In Figure 8, the insured has two separate acreage locations in three grids. First, the insured would have to select a point of reference in Grid 4. Similar to the contiguous acreage guidelines, the insured then has the option of combining the acreage in Grid 1 and Grid 2, or insuring them separately by grid. Therefore, depending on the insured, there may be 2 or 3 Grid ID's in this scenario.
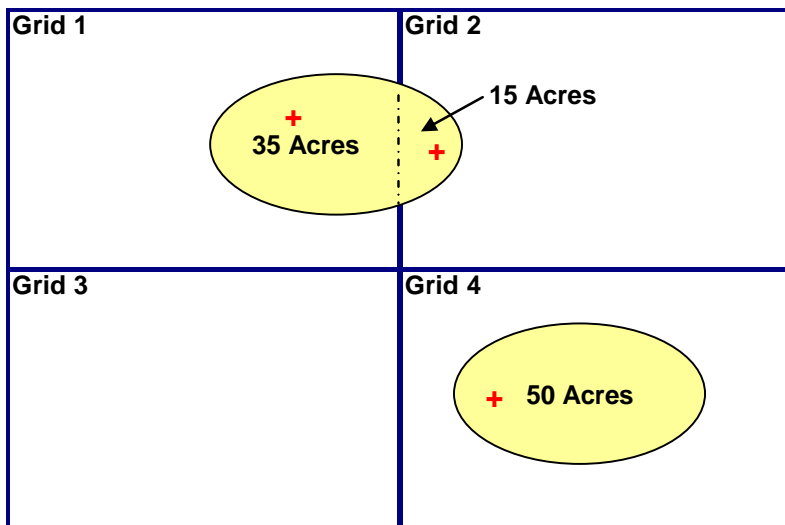
Figure 7. Non-contiguous Acreage in Different Grids

As illustrated in Figure 9, if the non-contiguous acreage is located in the same grid, the non-contiguous acreage will be combined and given a single Grid ID.
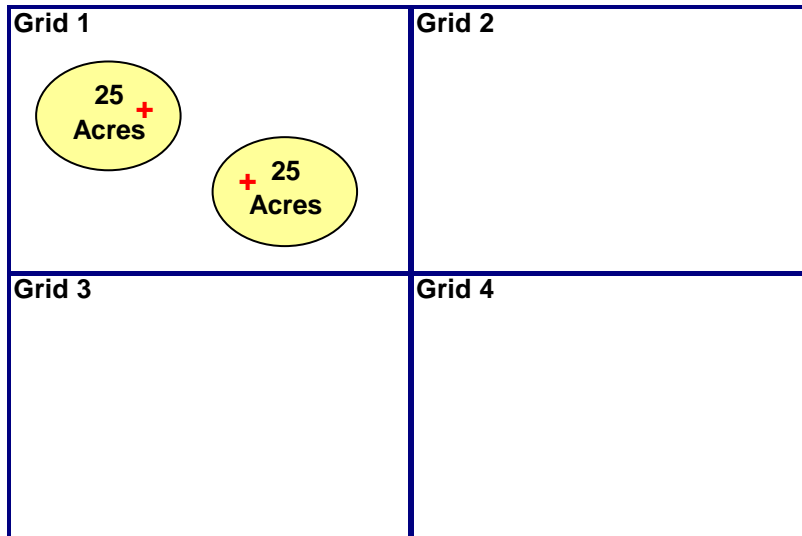
Figure 8. Non-contiguous Acreage in the Same Grid

Other Links on the Website

In addition to the link described above, there are additional links on the Pasture, Rangeland, Forage webpage that are useful to the applicant. When these additional links are selected the insured will be able to view other options and data related to the PRF-VI Pilot Program. Once a link is selected follow the on line options to view the information desired.

Appendix D: Pasture, Rangeland, Forage Vegetation Index Example

Introduction

The first half of this example walks a producer, Joe Rancher, through the basic information needed at the time of sign up/application. The second half of this example illustrates how the indemnity will be calculated at the time of loss.

At the time of application

Acreage and Grid Information

Joe Rancher has 645 acres of grazingland and hayland in two counties in Texas. His acreage is contained in five non-contiguous properties: A, B, C, D, and E.
A = grazingland (100% share)
B = grazingland (100% share)
C = grazingland and hayland (50% share)
D = grazingland (100% share)
E = grazingland (100% share)

Using the website, Joe Rancher locates his property and the corresponding grids (For information on locating the grids and using the website, see Appendix C). His properties are illustrated below in Figure 10.

Figure 9. Joe Rancher's Properties

Joe Rancher decides to insure the four properties (535 insurable acres) located in County B (named Archuleta County in this example) and leave property A, uninsured in County A. Had he chosen to insure Property A in County A, he would have had to insure that acreage separately because Property A is non-contiguous from his other properties and located in a different county.

For his properties in County B, he has a couple of options in dividing his property among the four Grid IDs.
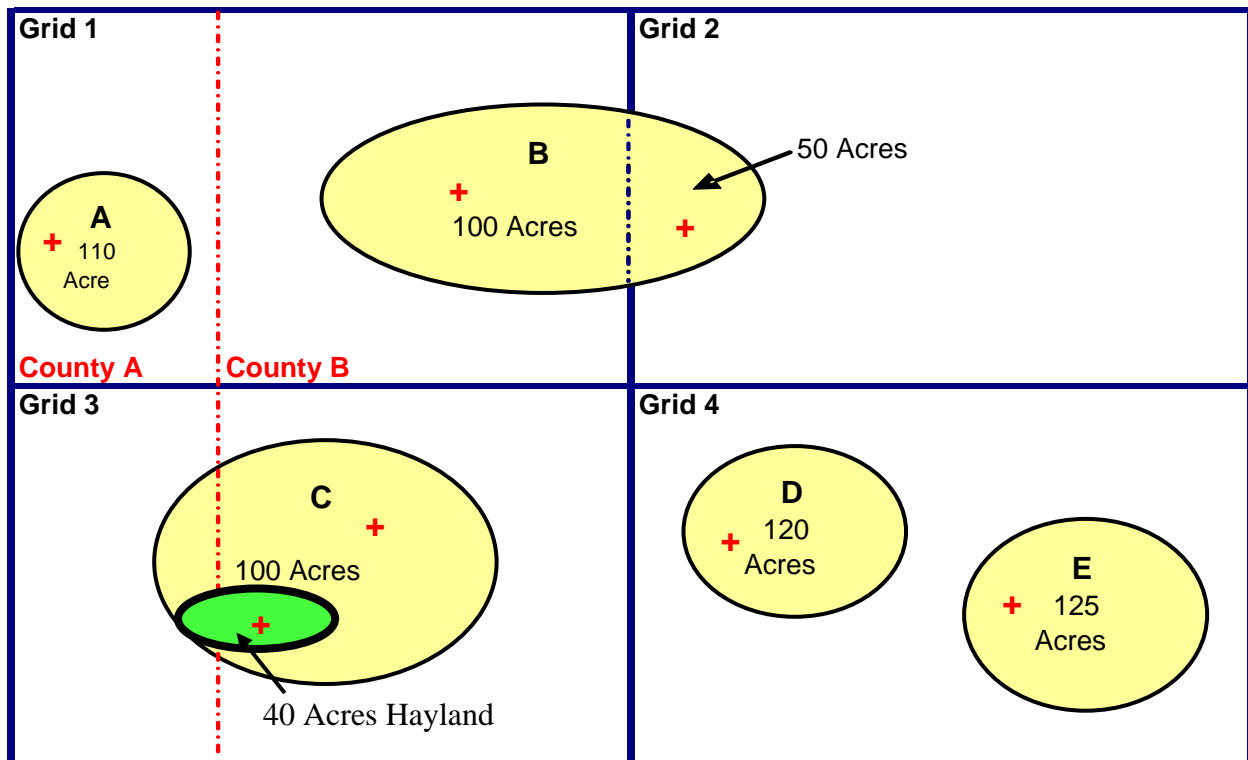
Property B – Contiguous acreage spread into more than one grid (grazingland with 100% share)

Since the insurable acreage spreads into Grid 1 and Grid 2, all contiguous acreage of the crop type may be combined into a single Grid ID using one point of reference for all of the acreage. Or, Joe Rancher may choose to separate the insured acreage into separate numbered Grid IDs in which the acreage is located.

Decision:
Joe Rancher decides to separate the property into two Grid IDs; with 100 insured acres in Grid 1 and 50 insured acres in Grid 2. He picks a reference point in each Grid ID, certifies the point of reference is representative of the insured acreage in the grid, and certifies the approximate amount of insured acreage in each grid.

Property C – Contiguous acreage spread into more than one county, which contains two crop types (both grazingland and hayland with 50% share)

Since the insurable acreage spreads into County A and County B, all contiguous acreage of the crop type may be combined into a single county (and Grid ID) using one point of reference for all of the acreage. Or, Joe Rancher may choose to separate the insured acreage by county in which the acreage is located. Of the 140 insurable acres in this property 100 acres is grazingland and 40 acres is hayland.

Decision:
Joe Rancher decides to pick a point of reference in County B and use that point of reference to represent all the contiguous insurable grazingland acreage (100 acres) in both County A and County B. He certifies the point of reference is representative of the insured acreage in the grid.

If Joe Rancher decides to insure his hayland acres (40 acres) he would follow the same steps for hayland, by selecting a point of reference in Grid 3 and depending on the point of reference the hayland would be insured in either County A or County B. Joe Rancher would also need to make all the decisions needed to complete the worksheet for his hayland acres.

Property D and E – Non-Contiguous acreage located in a single grid (both grazingland with 100% share)

Since properties D and E are both located in Grid ID 4, the acreage is combined and insured as a single unit, even though they are non-contiguous acres.

Decision:
Joe Rancher combines Properties D and E and insures all 245 acres under Grid ID 4. He picks a reference point and certifies that it is representative of the acreage in the grid.

To recap, the following are the Grid IDs, the properties located in each, and acreage insured for grazingland:

Grid ID	Property	Insured Acreage
Grid 1 (insert the actual Grid ID number for the insured, i.e. 377881)	B	100
Grid 2 (insert the actual Grid ID number for the insured, i.e. 377882)	B	50
Grid 3 (insert the actual Grid ID number for the insured, i.e. 388773)	C	100
Grid 4 (insert the actual Grid ID number for the insured, i.e. 388774)	D & E	245
Total		495

Protection

Coverage Level
Joe Rancher chooses a coverage level of 85%. He is required to insure each Grid ID in the county at the same coverage level.

Productivity Factor
Joe Rancher chooses a productivity factor of 120 percent. The productivity factor is defined as:
"A percentage factor selected by you that allows you to individualize your coverage based on the productivity of the crops you produce and may be between 60 and 150 percent. Only one productivity factor may be selected per county and crop type."

County Base Value
By looking at the Pasture, Rangeland, Forage Vegetation reports (rates and subsidies), Joe Rancher sees that the county base value per acre for grazingland is $17.65 (For more information on premiums, rates, and subsidies contact your agent).

Dollar Amount of Protection per Acre
The Dollar Amount of Protection per acre is the result of multiplying the County Base value, times the coverage level selected, times the productivity factor percentage selected. Joe Rancher's Dollar Amount of Protection per Acre is calculated as follows:

$ Amt of Protection per Acre = county base value x coverage level selected x productivity factor selected

$$= \$17.65 \; x.85 \; x \; 1.20$$
$$= \$18.00 \text{ per Acre}$$

Percent of Insured Acreage per Index Interval and Number of Insured Acreage per Index Interval

Joe Rancher may designate a specific percentage of the insured acreage to more than one index intervals for each Grid ID, or he may put all of the insured acreage into one index interval.

Joe Rancher and his agent look up the Special Provisions of Insurance for Colorado. In Archuleta County (used only as an example), he finds that if he places insured acreage in more than one index interval, he must place a minimum of 10% of his insured acreage in that index interval chosen. He also learns that the sum of all the insured acreage per index interval must equal 100% or the total number of insured acreage for each Grid ID.

Joe Rancher chooses the following percent of insured acreage per index interval in which he can now calculate the number of acres per index intervals (also listed in the table is the unit number based on his decisions):

Grid ID	Index Interval	Unit Number	% Protection	Number of acres
Grid 1	I	00100	100%	100 ac
	II			
Insured acreage = 100	III			
	IV			
	Total		100%	100 ac
Grid 2	I	00100	10%	5 ac
	II	00200	50%	25 ac
Insured acreage = 50	III			
	IV	00300	40%	20ac
	Total		100%	50 ac
Grid 3	I	00100	50%	50 ac
	II			
Insured acreage = 100	III			
	IV	00200	50%	50 ac
	Total		100%	100 ac
Grid 4	I	00100	50%	122.5 ac
	II	00200	30%	73.5 ac
Insured acreage = 245	III	00300	20%	49 ac
	IV			
	Total		100%	245 ac

Policy Protection per unit

To figure out the policy protection per unit, Joe Rancher must multiply the Dollar Amount of Protection per Acre, which was already calculated as $18.00 times the number of insured acreage per unit (crop type, Grid ID, and index interval), times his applicable share. The table below shows the result of that calculation.

Grid ID	Index Interval	Unit Number	Policy Protection/Unit
Grid 1 **Insured acreage = 100** **100% share**	I ($18.00 X 100ac X 1.0)	00100	$1,800
	II		
	III		
	IV		
Grid 2 **Insured acreage = 50** **100% share**	I ($18.00 X 5ac X 1.0)	00100	$90
	II ($18.00 X 25ac X 1.0)	00200	$450
	III		
	IV ($18.00 X 20ac X 1.0)	00300	$360
Grid 3 **Insured acreage = 100** **50% share**	I ($18.00 X 50ac X 0.50)	00100	$450
	II		
	III		
	IV ($18.00 X 50ac X 0.50)	00200	$450
Grid 4 **Insured acreage = 245** **100% share**	I ($18.00 X 122.5ac X 1.0)	00100	$2,205
	II ($18.00 X 73.5ac X 1.0)	00200	$1,323
	III ($18.00 X 49ac X 1.0)	00300	$882
	IV		
Policy Protection			**$8,010**

Policy Protection

The Policy Protection is the sum of the policy protection per units, and in this example equals $8,010.

Premium Rate

Joe Rancher and his agent look up the applicable premium rate using the premium rate tables provided in the actuarial documents or the Pasture, Rangeland, Forage Vegetation reports (rates and subsidies). The table below shows the premium rate for each Grid ID and index interval (the rates and information used in the example are for illustration purposes and are not actual rates for Archuleta County).

Grid ID	Index Interval	Unit Number	Rate/$100
Grid 1	I	00100	$12.00
	II		
	III		
	IV		
Grid 2	I	00100	$13.50
	II	00200	$13.00
	III		
	IV	00300	$12.00
Grid 3	I	00100	$13.00
	II		
	III		
	IV	00200	$12.00
Grid 4	I	00100	$13.00
	II	00200	$14.00
	III	00300	$15.00
	IV		

Premium/Unit (Index interval)

For each index interval, Joe Rancher will need to determine the Premium/unit (index interval) using the following formula:

Premium/unit (Index interval) =
$amount of protection/acre
x number of insured acreage/unit
x premium rate
x adjustment factor of 0.01
x share

For example, in Grid 1, his Premium for Index Interval I would be calculated as follows:

Total Premium by Grid 1, Index Interval I =$18.00 ($ amt of protection per unit)
x 100 insured acreage
x 12.00 (premium rate)
x 0.01 (adjustment factor)
x 1.0 (share)
= **$216.00**

Using the formula, Joe Rancher determines the Premium/unit (Index Interval) for each grid (premium rounded to the nearest whole dollar).

Grid ID	Insured Acreage & Share	Index Interval	Unit Number	Policy Protection/ unit	Premium Rate/$100	Premium
Grid 1	100ac 100% share	I	00100	($18.00 x 100 ac x 1.0 share) = $1,800	$12.00	$216
		II				
		III				
		IV				
		Total		**$1,800.00**		**$216**
Grid 2	50ac 100% share	I	00100	$90.00	$13.50	$12
		II	00200	$450.00	$13.00	$59
		III				
		IV	00300	$360.00	$12.00	$43
		Total		**$900.00**		**$114**
Grid 3	100ac 50% share	I	00100	$450.00	$13.00	$59
		II				
		III				
		IV	00200	$450.00	$12.00	$54
		Total		**$1,800.00**		**$113**
Grid 4	245ac 100% share	I	00100	$2,205.00	$13.00	$287
		II	00200	$1,323.00	$14.00	$185
		III	00300	$882.00	$15.00	$132
		IV				
		Total		**$4,410.00**		**$604**
Grand Totals				**$8,010**		**$1,047**

The sum of all the premiums by index interval equals the Total Policy Premium for grazingland in Archuleta County (rates and name or only used for example purposes they are not the actual rates), which in this example equals $1,047.

Premium Subsidy

To find the applicable subsidy percentage, Joe Rancher and his agent refer to the subsidy tables provided in the Pasture, Rangeland, Forage Vegetation reports (rates and subsidies) or actuarial document. For the coverage level of 85%, the applicable subsidy percentage is 59%.

The Premium Subsidy per Unit is the result of the total Premium per unit multiplied by the applicable Subsidy Percentage.   Therefore Joe Rancher's Premium Subsidy per unit is calculated as follows:

> Premium subsidy per unit =   Premium per unit x subsidy rate
>
> Example   = \$216 x 0.59
>   = \$127

Premium due from Grower

The Premium due from Grower for each unit (index interval) is the result of the Premium per unit minus the Premium Subsidy Amount per unit. Therefore Joe Rancher's Producer Premium per unit is calculated as follows:

> Producer premium per unit = Premium per unit – Premium subsidy per unit
>
> Example Premium Due   =   \$216 - \$127
>   \$89

Using the above formulas Joe Rancher and his agent calculates the Premium Subsidy per Unit and the producer premium per unit. They sum these columns to determine the Total subsidy amount and the Total Producer Premium. The table below provides a summary of these calculations.

Grid ID	Index Interval	Unit Number	Premiums	Premium Subsidy	Producer Premium
Grid 1	I	00100	$216	$127	$89
	II				
	III				
	IV				
Grid 2	I	00100	$12	$7	$5
	II	00200	$59	$35	$24
	III				
	IV	00300	$43	$25	$18
Grid 3	I	00100	$59	$35	$24
	II				
	III				
	IV	00200	$54	$32	$22
Grid 4	I	00100	$287	$169	$118
	II	00200	$185	$109	$76
	III	00300	$132	$78	$54
	IV				
Totals			$1,047	$617	$430

Pasture, Rangeland, Forage Vegetation Index Worksheet

To see how all of the above sections tie in together, Joe Rancher and his agent take all of the information they have accumulated at this point and enter it into the Pasture, Rangeland, Forage Vegetation Index Worksheet. This will allow them to see everything organized into one document.

PASTURE, RANGELAND, FORAGE VEGETATION INDEX WORKSHEET

1. Insured's Name: _Joe B. Rancher_   **2. Date:** _10_/_15_/_2006_   **3. State:** _CO_ (08)   **4. County:** _Archuleta_ (007)

5. Crop Type: _Grazingland_   **6. Coverage Level/Trigger Index:** _85_   **7. Productivity Factor:** _120_ %   **8. $ Amt. of Prot/Ac:** _18.00_

9. Grid ID	10. Insurable Acreage	11. Insured Acreage	12. Share	13. Index Interval		14. Unit Number	15. % Insured acreage/ Unit	16. Insured acreage/ Unit	17. Policy Protection/ Unit	18. Premium Rate/$100	19. Premium/ Unit	20. Premium Subsidy Amt	21. Premium Due From Grower
			percentage				percentage	acres	dollars	dollars	dollars	dollars	dollars
378811	100	100	100	I	221	00100	50	50	900	12.00	108	64	44
				II	222	00200	50	50	900	14.00	126	74	52
				III									
				IV									
						Total	100	100					
378812	50	50	100	I	221	00100	10	5	90	13.50	12	7	5
				II	222	00200	50	25	450	13.00	59	35	24
				III									
				IV									
						Total	100	50					
378813	100	100	50	I	221	00100	50	50	450	13.00	59	35	24
				II									
				III									
				IV									
						Total	100	100					
378814	245	245	100	I	221	00100	50	122.5	2205	13.00	287	169	118
				II	222	00200	30	73.5	1323	14.00	185	109	76
				III	223	00300	20	49	882	15.00	132	78	54
				IV									
						Total	100	245					
County Totals	10a. 495	11a. 495						16a. 495	17a. $8,010		19a. $1,047	20a. $617	21a. $430

Prepared by: _Big Boy Agent_ (Agent's Signature)   **Insured's Initials:** _JBR_

At the Time of Loss

At the end of the insurance period, the FCIC issues a Final Grid Index for Joe Rancher's insured grids. As determined above, his Trigger Grid Index is 85 for all grids and index intervals. The following table illustrates the Final Grid Index for each grid and index interval and whether the Final Grid Index is above or below the Trigger Grid Index.

Grid ID	Index Interval	Unit Number	Final Grid Index	Above or Below Trigger
Grid 1	I	00100	120	Above
	II			
	III			
	IV			
Grid 2	I	00100	110	Above
	II	00200	90	Above
	III			
	IV	00300	70	**Below**
Grid 3	I	00100	110	Above
	II			
	III			
	IV	00200	60	**Below**
Grid 4	I	00100	120	Above
	II	00200	70	**Below**
	III	00300	60	**Below**
	IV			

Calculating Indemnities

A payment is only made if the Final Grid Index for the insured unit is less than the Trigger Grid Index, regardless of the individual's actual precipitation in that index interval.

Payment calculation factor =   (Trigger Grid Index – Final Grid Index)
                                                        Trigger Grid Index

Indemnity payment   =   Payment calculation factor
                                                  x Policy protection per unit

Grid 1 – 100 Acres
Index interval I: The Final Grid Index of 120 is above the Trigger Grid Index of 85. No indemnity is due.

Grid 2 – 50 Acres
Index Interval I: The Final Grid Index of 110 is above the Trigger Grid Index of 85. No indemnity is due.

Index Interval II: The Final Grid Index of 90 is above the Trigger Grid Index of 85. No indemnity is due.

Index Interval IV: The Final Grid Index of 70 is below the Trigger Grid Index of 85. The indemnity is calculated as follows:

Payment calculation factor = $\dfrac{(85 - 70)}{85}$

                          =   .176

Indemnity payment   =   .176 *x* $360
                          =   **$63**

Grid 3 – 100 Acres
     Index Interval I: The Final Grid Index of 110 is above the Trigger Grid Index of 85. No indemnity is due.

Index Interval IV: The Final Grid Index of 60 is below the Trigger Grid Index of 85. The indemnity is calculated as follows:

Payment calculation factor = $\dfrac{(85 - 60)}{85}$

                          =   .294

Indemnity payment   =   .294 *x* $450
                          =   **$132**

Grid 4 – 245 Acres
     Index Interval I: The Final Grid Index of 120 is above the Trigger Grid Index of 85. No indemnity is due.

Index Interval II: The Final Grid Index of 70 is below the Trigger Grid Index of 85. The indemnity is calculated as follows:

Payment calculation factor = $\dfrac{(85 - 70)}{85}$

                          =   .176

Indemnity payment   =   .176 *x* $1,323
                          =   **$233**

Index Interval III: The Final Grid Index of 60 is below the Trigger Grid Index of 85. The indemnity is calculated as follows:

Payment calculation factor $=$ $\dfrac{(85 - 60)}{85}$

$=$ .294

Indemnity payment $=$ .294 *x* $882

$=$ **$259**

A total indemnity of $687 will be due to Joe Rancher, for this County, for this crop year.

Appendix E: Test Questions

Pasture, Rangeland, Forage Vegetation Index Insurance Program

Training Materials – Test
Answers

Multiple Choice, select one correct answer by circling the letter beside the correct statement.
Correct Answer in Bold, *explanation follows in italics*.

1. The new Pasture, Rangeland, Forage Vegetation Index plan of insurance is:
   a. based on NASS reported county average yields.
   b. **a Group Risk Plan**.
   c. based on actual yield history.
   d. not available for hayland.

The new Pasture, Rangeland, Forage Vegetation Index plan of insurance is a Group Risk Plan (GRP) and utilizes the current GRP Basic Provisions, but is not based on NASS reported county average yields.

2. A specified period of time in which NDVI and temperature data are collected that result in a grid index is defined as:
   a. **an index interval.**
   b. a point of reference.
   c. both a point of reference and index interval.
   d. a grazingland or hayland.

Index Interval – A specified period of time in which NDVI and temperature data are collected that results in a grid index. For the purposes of these crop provisions, index intervals are further in the Special Provisions.

3. Bi-weekly Vegetative index values are collected for 1-km grids (0.6 miles) and then averaged across grids which are:
   a. correlated with range and township lines.
   b. approximately 3 by 5 miles in size.
   c. assigned a number by insurance agents.
   d. **4.8 miles by 4.8 miles in size.**

The data are collected for 1-km grids (0.6 miles) and then averaged across 8 km or 4.8 mile grids to produce the base value used in the vegetation index.

4. There are four index intervals per year in the Pasture, Rangeland, Forage Vegetation Index Insurance Program because:
   a. most forage crops are grown within a three month period.
   b. there are really four different forage growing seasons across the nation.
   c. **using four index intervals was the best way to capture the variations in growing conditions across the nation and allow producers the most flexibility.**

d. Vegetation that grew more than three months ago is not relevant to annual forage production.

After extensive discussions with the subject matter experts and the observed large variation between regions, the best way to capture the variations in conditions throughout the United States and allow producers the most flexibility to insure periods in the year that best reflect their local conditions was to divide the year into 4, 3-month intervals.

5. Crop types for the Pasture, Rangeland, Forage Vegetation Index Insurance Program are:
    a. alfalfa and coastal Bermuda grass.
    b. **grazingland and hayland forage**.
    c. little bluestem, fescue and crimson clover.
    d. warm season and cool season forages.

Crop Types – Grazingland and Hayland forage.

6. To insure grazingland or hayland forage with the Pasture, Rangeland, Forage Vegetation Index Insurance Program the following must be determined before the sales closing date:
    a. **Grid ID, crop type, and index intervals**.
    b. expected yield.
    c. harvest date.
    d. beginning and ending dates for grazing.

Grid ID, crop type, and index intervals will be determined prior to the sales closing date. Sales Closing – November 30 (declare crop type, select value, coverage, Grid ID, index intervals, determine and report number of insurable acres and insured acres)

7. For the Pasture, Rangeland, Forage Vegetation Index Insurance Program November 30 is:
    a. the premium billing date.
    b. the beginning of the crop year.
    c. **the sales closing date.**
    d. the end of the crop year.

Sales Closing – November 30

8. Under the Pasture, Rangeland, Forage Vegetation Index Insurance Program an indemnity may be due for an index interval when:
    a. the Final Grid Index falls below the expected grid index.
    b. the expected grid index is larger than the Trigger Grid Index.
    c. **the Final Grid Index falls below the Trigger Grid Index**.
    d. the Final Grid Index is larger than the Trigger Grid Index.

A payment may be made only if the Final Grid Index for the insured unit is less than the Trigger Grid Index.

9. The Trigger Grid Index is:

a. **the selected coverage level multiplied by the expected grid index shown on the actuarial documents**.
b. the expected grid index shown on the actuarial documents multiplied by the crop value.
c. the selected coverage level multiplied by the Final Grid Index.
d. the expected grid index shown on the actuarial documents multiplied by the dollar amount of protection per unit.

Trigger Grid Index – The result of multiplying the expected grid index for the unit by the coverage level selected by the insured.

10. For each Pasture, Rangeland, Forage Vegetation Index unit (Grid ID, crop type, and index interval):
    a. **an insured may select one or more index intervals listed in the Special Provisions of Insurance for each Grid ID number and crop type.**
    b. an insured must select at least two index intervals listed in the Special Provisions of Insurance for each Grid ID number and crop type.
    c. an insured must select at least three index intervals listed in the Special Provisions of Insurance for each Grid ID number and crop type.
    d. an insured may select no more than two index intervals listed in the Special Provisions of Insurance for each Grid ID number and crop type.

An insured may select more than one index interval for each Grid ID and crop type, however, if an index interval is chosen the insured must place a minimum of 10% of their insured acres in each index interval chosen. The sum of all the insured acres per unit must equal the total number of elected insured acres for each Grid ID by crop type.

True or false, circle the letter beside the correct answer.

11. The new Pasture, Rangeland, Forage Vegetation Index Insurance Program is a Group Risk Plan (GRP) and utilizes the current GRP Basic Provisions.
    a. **True**
    b. False

The new Pasture, Rangeland, Forage Vegetation Index Insurance Program is a Group Risk Plan (GRP) and utilizes the current GRP Basic Provisions.

12. A Grid ID is a specific code associated with each NDVI grid (4.8 by 4.8 miles).
    a. **True**
    b. False

Grid ID – A specific code associated with each grid contained in the actuarial documents.

13. The Vegetation index predicts forage production on each insured's operation.
    a. True
    b. **False**

The Vegetation index does not explicitly predict forage on a given producers operation. Instead, the index is simply a reflection of how much Vegetation is present for a given 3-month interval for a specified NDVI grid(s) declared by the producer relative to a long term average for the same interval and grid. Research indicates that the Vegetation index is highly correlated with forage production but does not directly predict forage production.

14. The bi-weekly NDVI data from EROS used for the vegetation index is collected for 1-km grids (0.6 miles) and then averaged across 8 km or 4.8 mile grids to produce the base value used in the vegetation index.
    a. **True**
    b. False

The NDVI data is based on satellites that have been observing the changes in greenness of vegetation of the earth since 1989 with bi-weekly values stored on computers at EROS from the maximum observed daily value observed during each 2-week period. The data is collected for 1-km grids (0.6 miles) and then averaged across 8 km or 4.8 mile grids to produce the base value used in the vegetation index.

15. An insured can place 5% of their insured acreage in any one of the index intervals.
    a. True
    b. **False**

An insured may select more than one index interval for each Grid ID and crop type, however, if a practice is chosen the insured must place a minimum of 10% of their insured acreage in each practice.

16. An insured is required to insure 100% of the crop type (s) acreage that he/she has in the county.
    a. True
    b. **False**

You are not required to insure 100% of the crop type (s) acreage chosen in the county; however, if you choose to insure the crop types under the Pasture, Rangeland, Forage Vegetation Index policy you cannot insure the same crop under any other FCIC subsidized program.

17. All contiguous acreage of the crop type may be combined into a single Grid ID using one point of reference for all of the acreage, including acreage that extends into an adjoining numbered grid or county.
    a. **True**
    b. False

All contiguous acreage of the crop type may be combined into a single Grid ID using one point of reference for all of the acreage, including acreage that extends into an adjoining numbered grid or county.

18. The county base value per acre specified in the actuarial documents for each crop type multiplied by the coverage level selected, multiplied by the productivity factor is the dollar amount of protection per acre.

a. **True**
b. False

Dollar Amount of Protection per Acre *– In lieu of the definition contained in section 1 of the GRP Basic Provisions, the county base value per acre specified in the actuarial documents for each crop type multiplied by the coverage level selected by you, and multiplied by the productivity factor selected by you. You may select only one dollar amount of protection per acre for each grid ID and crop type.*

19.   The new Pasture, Rangeland, Forage Vegetation Index Insurance Program will also cover forage losses due to fire and hail.
a.   True
b.   False

The following coverage does NOT apply to Pasture, Rangeland, Forage Vegetation Index Insurance Program: (a) Hail and fire exclusion provisions.

20.   A Pasture, Rangeland, Forage Vegetation Index Insurance Policy may be issued to a landlord but not to a tenant.
a.   True
b.   False

A Pasture, Rangeland, Forage Vegetation Index policy provides coverage from a significant reduction in the Vegetation Index, and may be issued to a landlord and/or tenant, as well as an owner/operator when the requirements of the policy and this handbook are met.

21.   Catastrophic Risk Protection (CAT) coverage is available for Pasture, Rangeland, Forage Vegetation Index plan of insurance.
a.   True
b.   False

Catastrophic risk protection (CAT) policies are not available under these crop provisions.

22.   The insured may select only one coverage level and dollar amount of protection per acre for each of the insured crop types in the county.
a.   True
b.   False

*The insured may select **only one** coverage level and dollar amount of protection per acre for each of the insured crop types in the county.*

23.   The dollar amount of protection per acre selected by the insured will be applied to each Grid ID and crop type for the county.
a.   True
b.   False

The dollar amount of protection per acre selected will be applied to each Grid ID and crop type.

24.   Insured is required to report yield history or maintain production records for the Pasture, Rangeland, Forage Vegetation Index policy.
        a. True
        b. False

Insured is NOT required to report yield history or maintain production records for the Pasture, Rangeland, Forage Vegetation Index policy. However, they are encouraged to maintain any individual crop production and acreage history for use or possible future use in a plan of insurance that uses APH yields for the same crop.

25.   With the written approval of the insurance provider, the insured may assign rights to an indemnity payment to someone else for the current crop year.
        a. True
        b. False

***Assignment of Indemnity.** The insured may assign rights to an indemnity payment to someone else for the current crop year.*

26.   In the Pasture, Rangeland, Forage Vegetation Index Insurance Program Insurable acreage consist of the total number of acres suitable of insurance under these crop provisions and will include both insured acres and acres of the crop type that are not insured
        a. True
        b. False

***Insurable Acreage** – Hayland and grazingland that is not planted annually (unless allowed by the Special Provisions). For the purposes of these Crop Provisions, overseeding into acreage of existing forage crops is an acceptable farming practice and is not considered an annual planting. Insurable acres will consist of the total number of acres suitable for insurance under these crop provisions which would include both insured acres and acres of the crop type that are not insured.*

27.   If an applicant chooses to insure grazingland or hayland under the GRP Vegetation Index Forage policy he/she cannot insure the same crop under any other FCIC subsidized program.
        a. True
        b. False

Under the Pasture, Rangeland, Forage Vegetation Index policy you cannot insure the same crop under any other FCIC subsidized program.

28.   If an applicant has non-contiguous acreage which is located in separate grids, the applicant may opt to use one point of reference for all the acreage and use only one Grid ID.
        a. True
        b. False

A point of reference must be selected for each non-contiguous acreage of the crop that is located in the county. If the non-contiguous acreage is located in separate grids, each non-contiguous acreage must have a Grid ID.

29. In the Pasture, Rangeland, Forage Vegetation Index Insurance Program Sales or the next crop year may be suspended or terminated if the Final Grid Index value for an index interval cannot be determined because NASA could not deliver the necessary NDVI data.
   a. True
   b. False

If, at any time during the crop year and for any reason, FCIC is not able to receive and process the satellite imagery utilized to determine and publish the Final Grid Index for any particular index interval (which includes but is not limited to, failure or destruction of the satellites and resulting data used for this program):
   (1) Sales for the next crop year may be suspended or terminated.

30. If the Final Grid Index value for an index interval is below the Trigger Grid Index because a wildfire burned most of the forage in the grid the insured in the effected grid would receive indemnity payments based on the total loses of the fire.
   a. True
   b. False

Causes of Loss
(a) Loses are only paid when the Final Grid Index is less than your Trigger Grid Index.
(b) The reduction in the Final Grid Index must be due to natural occurrences.
(c) A reduction in the Final Grid Index due to a cause other than a natural occurrence will result in the assignment of a value to the Final Grid Index in an amount determined to correspond to the reduction due to natural occurrences only.

31. Overseeding into hayland and grazingland, which are not planted annually, is an acceptable farming practice and is not considered as an annual planting.
   a. True
   b. False

Hayland and grazingland that is not planted annually (unless allowed by the Special Provisions). For the purposes of these Crop Provisions, overseeding into acreage of existing forage crops is an acceptable farming practice and is not considered an annual planting.

Appendix F: Training Slides